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ABSTRACT BOOK



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A-0001 FUNCTIONAL AND CLINICAL OUTCOMES AFTER SURGICAL TREATMENT OF GIANT CELL TUMOUR OF THE TENDON SHEATH IN THE HAND

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Background: Giant cell tumour of the tendon sheath (GCTTS) is a benign, locally invasive tumour most often found in the hand and wrist. It typically presents as a slow-growing, painless mass along the flexor tendon sheaths. Surgery is the primary treatment, but recurrence can occur, and its impact on function remains unclear. This study evaluates functional and clinical outcomes after surgical treatment for GCTTS.

Methods: We retrospectively reviewed 42 patients who underwent excisional biopsy for hand masses and were histopathologically diagnosed with GCTTS at our institution between January 2014 and December 2023. We excluded patients with pre-existing hand function conditions (e.g., burns, fractures, or rheumatoid arthritis), prior surgery elsewhere, or unavailable MRI data, resulting in a final sample of 37 patients (14 men, 23 women). We recorded tumour recurrence and postoperative complications. Functional outcomes were assessed with the Michigan Hand Outcomes Questionnaire (MHQ), which evaluates hand function, daily activities, work performance, pain, aesthetics, and satisfaction. At final follow-up, MHQ scores were compared between affected and unaffected hands. We also analysed the impact of presenting pain, trauma history, dominant hand tumour, MRI-detected bone erosion, and tumour size on these outcomes.

Results: Of the 37 patients (23 women and 14 men) included, the mean age was 37.3 ± 15.0 years (range, 10–65 years). The mean follow-up period was 74.2 ± 38.2 months (median, 77 months). Patients showed right-hand dominance in 78.4% of cases. The most common tumour sites were the middle phalanx (35.1%) and proximal phalanx (27%). Other sites included the metacarpophalangeal joint (13.5%), distal phalanx (13.5%), distal interphalangeal joint (5.4%), interphalangeal joint (2.7%), and proximal interphalangeal joint (2.7%). More than half of the tumours (56.8%) occurred in the dominant hand. A trauma history was present in 35.1% of cases. At presentation, 78.4% reported swelling only, while 21.6% had swelling with pain. Bone erosion was observed radiologically in 27%. Notably, recurrence occurred in 4 patients (10.8%) at a mean of 21 months postoperatively (range, 17–28 months).

Postoperative functional results were generally favourable, as indicated by MHQ scores. However, patients who experienced recurrence had significantly worse functional outcomes, as indicated by lower MHQ-function, MHQ-work, MHQ-pain, and MHQ-satisfaction scores compared to non-recurrent cases ($p < 0.05$). Similarly, cases with bone erosion at presentation had significantly decreased MHQ-function and MHQ-satisfaction scores ($p < 0.05$), indicating a negative impact on hand function and patient satisfaction. Tumour location in the dominant hand, trauma history, and tumour size did not significantly affect MHQ outcomes. Major postoperative complications were not observed.

Conclusion: Surgical excision of giant cell tumour of the tendon sheath in the hand yields favourable functional outcomes. However, recurrence and the presence of bone erosion could significantly impair function. Therefore, clinicians should identify high-risk patients and provide thorough preoperative counselling and close postoperative follow-up to optimise management.

A-0002 SURGICALLY TREATED METACARPAL FRACTURES: A REGISTRY-BASED STUDY WITH 3286 CASES

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Background: Metacarpal fractures are frequent injuries, representing approximately one third of all hand fractures and around one fifth of all fractures overall. Although percutaneous fixation with Kirschner wires (K-wires) is the most widely used surgical technique, there is still no clear consensus on the optimal treatment strategy. Patient-reported outcomes after surgical management remain sparsely described. In this study, we report demographics and patient-reported outcomes associated with different fixation techniques for metacarpal fractures, based on data from the Swedish National Quality Registry for Hand Surgery (HAKIR).

Methods: This retrospective cohort study included patients aged ≥ 18 years with surgically fixated metacarpal fractures registered in HAKIR during 2010–2022, excluding reoperations and fractures associated with other injuries. Patient-reported outcome measures (the HQ-8 and QuickDASH) were collected at 3 and 12 months postoperatively.

Results: A total of 3,286 cases were analyzed. The number of male patients was significantly higher than the number of female patients, and the male patients were also significantly younger than the female patients ($p < 0.001$). QuickDASH scores showed significant improvement from 3 months (median: 15.9, interquartile range [IQR]: 6.8–31.8) to 12 months (median: 8.0, IQR: 2.3–20.5) ($p < 0.001$). At 12 months, no significant differences were seen between fractures in the thumb, fingers, and multiple fractures. No significant difference was found between open and closed fractures. The most common fixation methods were K wire/cerclage (61%), plate fixation (16%), and screw fixation (11%), but there was significant variation between hospitals; for example K-wire/cerclage use varied from 29% to 80% ($p < 0.001$). At 12 months, the only HQ-8 item that differed between fixation methods was weakness, which was significantly better for screws without plating compared to K-wire/cerclage ($p = 0.048$). QuickDASH scores at 12 months showed no significant differences between fixation methods.

Conclusion: One year after surgery for isolated metacarpal fractures, patients generally achieve favorable patient-reported outcomes, with young men being the predominant group affected. In our cohort, the most frequently used surgical technique was K-wire/cerclage. Although fixation methods varied considerably across the country, no differences in QuickDASH scores were observed 12 months after surgery.

A-0003 CLINICAL OUTCOME OF MODIFIED WASSEL–FLATT TYPE IV RADIAL POLYDACTYLY: ANALYSIS OF SUBTYPE AND MORPHOLOGY

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Purpose: This study assessed the differences in clinical outcomes among the subtypes of type IV radial polydactyly and evaluated the distribution of the duplication range according to subtype.

Methods: This retrospective study included 85 patients with 89 affected thumbs, who were treated at a single center from October 2017 to May 2023. The patients were classified according to the modified Wassel–Flatt classification, and only those with type IV radial polydactyly were included. The collected data included demographics, surgical techniques,

clinical outcomes, and radiological outcomes. Clinical outcomes were analyzed using the Japanese Society for Surgery of the Hand scoring system.

Results: The most common subtype of radial polydactyly was IV-B, accounting for 50 patients. Types IV-C and IV-D accounted for 17 and 22 patients, respectively. The median age at the time of surgery was 10 months, and the median follow-up was 24 months. Type IV-D demonstrated significantly lower total JSSH scores and functional parameter scores than types IV-B and IV-C. Regarding functional parameters, type IV-D exhibited significantly poorer outcomes in terms of interphalangeal joint stability and alignment, as well as range of motion; however, metacarpophalangeal joint stability and alignment were similar among the types. Type IV-D also exhibited significant differences in the distribution of the duplication range compared with type IV-B and IV-C. It had a more distal duplication level.

Conclusions: Type IV-D radial polydactyly requires more complex surgical interventions and has less favorable outcomes than types IV-B and IV-C. It exhibits poorer functional outcomes, particularly in the interphalangeal joint and range of motion assessments. Furthermore, type IV-D exhibits differences in the duplication range compared with other subtypes, and has a more distal duplication level.

A-0004 ARTHROSCOPIC PARTIAL TRAPEZIECTOMY AND FREE TENDON SUSPENSION & INTERPOSITION COMBINE WITH INTERNAL BRACE FOR BASAL JOINT ARTHRITIS OF THUMB

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This study examined whether arthroscopic partial trapeziectomy and tendon suspension & interposition (palmar longus tendon) arthroplasty combined with soft anchor internal brace treatment of thumb basal joint arthritis could produce clinical improvement and result in successful functional outcomes for patients. From August 2010 to April 2012, we treated 23 thumbs with symptomatic thumb basal joint arthritis (Eaton stage II-III) using arthroscopic partial trapeziectomy and palmar longus (PL) tendon suspension arthroplasty combined with soft anchor internal brace. The sample included 20 women and 3 men with a mean age of 58.0 years (range, 54 to 68 years). All patients underwent regular clinical follow-up at a mean of 26.2 months (range, 24 to 36 months). Pain scores improved in all patients after the operation. The thumb pinch strength significantly improved in all thumbs following the operation ($P < .01$). All patients were satisfied with the results and reported improved daily activities. In our series, no patient developed arthritis of the scaphotrapezium joint post-operation. Only an average of 1.2 mm (range 0.8 to 2.6) migration of the first metacarpal bone was found in a year's follow-up. Using the described method of arthroscopic partial trapeziectomy and tendon (PL) suspension with an internal brace in patients with symptomatic thumb carpometacarpal arthritis, most patients achieved good subjective results, and the pinch strength improved significantly in the majority of patients. Of 23 thumbs, 20 had satisfactory subjective and functional stability at a minimum of 2 years' follow-up.

A-0005 CLINICAL EFFICACY ANALYSIS OF ENDOSCOPIC CARPAL TUNNEL RELEASE COMBINED WITH INTRAOPERATIVE NERVE STIMULATION FOR CARPAL TUNNEL SYNDROME

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Carpal tunnel syndrome (CTS) is the most common peripheral entrapment neuropathy and is generally treated first by conservative measures. However, these measures generally do not result in satisfactory outcomes. Recently, there

has been an increasing research attention on endoscopic transcarpal ligament release (TCL) add intraoperative nerve stimulation (IONS) for its potential effects on axonal regeneration and neurological recovery. Although few studies have analyzed the effects of IONS treatment in CTS, there is a need for further investigation to reach a concrete conclusion. This randomized controlled trial selected patients referred to the hand clinic at our hospital during 2023 with a diagnosis of mild and moderate idiopathic CTS. These patients were randomly assigned to the following two groups: a control group (I) that underwent only endoscopic carpal tunnel release (Agee 3M) surgery, and a group (II) that received endoscopic carpal tunnel release surgery and IONS on the median nerve during surgery. The outcome measures were assessed by the visual analog scale, the Boston Carpal Tunnel Syndrome Questionnaire, and electrophysiological findings, including the peak latency of sensory nerve action potential and the onset latency of the compound muscle action potential. A total of 36 patients (6 males and 30 females) were included (18 wrists as the control group, of which 8 wrists were mild and the remaining 10 were of moderate stage, and 18 wrists as the IONS group, of which 8 wrists were mild and the remaining 10 were of moderate stage). Before treatment, there were no significant differences between the two groups, except for the median peak latency of sensory nerve action potential that was significantly higher among patients in group II ($p = 0.03$). After 12 weeks of treatment, all the measured variables significantly increased in both groups. Finally, the changes in nerve study of the evaluated outcome measures were found to be significantly different between the two groups with moderate-stage patients. This study demonstrated that within a relatively short period of time after treatment, an intraoperative nerve stimulation could result in faster recovery in wrists with moderate severity than in wrists that received only the endoscopic carpal tunnel release surgery.

A-0006 PATIENT-RATED WRIST EVALUATION (PRWE) QUESTIONNAIRE - TRANSLATION, VALIDATION, AND CROSS-CULTURAL ADAPTATION IN SERBIAN

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Background: The Patient-Rated Wrist Evaluation (PRWE) is a widely used patient-reported outcome measure for assessing pain and functional limitations in wrist and hand disorders. However, no validated Serbian version has been available to date, limiting standardized patient evaluation in Serbian-speaking populations.

Objectives: This study aimed to translate, culturally adapt, and psychometrically validate the PRWE questionnaire in Serbian, thereby providing a reliable instrument for clinical practice and research.

Methods: The translation and cross-cultural adaptation followed established international guidelines, including forward translation, synthesis, back-translation, and expert committee review. A total of 163 patients with wrist and hand conditions completed the Serbian PRWE, alongside the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire and the 12-Item Short Form Health Survey (SF-12). Internal consistency was assessed using Cronbach's alpha, test-retest reliability with the intraclass correlation coefficient (ICC), and construct validity through exploratory and confirmatory factor analyses. Convergent validity was examined via correlations with DASH and SF-12 scores.

Results: The Serbian PRWE demonstrated excellent internal consistency (Cronbach's $\alpha = 0.903$ for pain, 0.944 for function) and high test-retest reliability (ICC = 0.957). Exploratory factor analysis revealed a three-component structure, while

confirmatory factor analysis supported the original two-factor model with acceptable fit indices. PRWE total and subscale scores showed significant positive correlations with DASH scores ($r = 0.229$, $p < 0.001$) and moderate negative correlations with SF-12 physical component scores ($r = -0.329$ to -0.433 , $p < 0.001$), confirming convergent validity. Conclusions: The Serbian version of the PRWE is a valid and reliable tool for assessing wrist- and hand-related disability and pain. Its availability enables standardized patient assessment in Serbian-speaking populations and supports cross-cultural research collaborations.

A-0007 CORRELATION AND OPTIMAL CUTOFF VALUE OF THE JAPANESE SOCIETY FOR SURGERY OF THE HAND SCORE FOR SATISFACTORY POSTOPERATIVE OUTCOMES IN RADIAL POLYDACTYLY: A RETROSPECTIVE COHORT STUDY

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Purpose: To assess the correlation between the Japanese Society for Surgery of the Hand (JSSH) score and parental satisfaction in patients with radial polydactyly and to identify the optimal JSSH score that correlates with parental satisfaction.

Methods: A retrospective study was conducted on 144 patients (144 thumbs) who underwent surgery for radial polydactyly between October 2017 and September 2023. Patients were classified according to the modified Wassel-Flatt classification, excluding hypoplastic types. Postoperative outcomes were evaluated using the JSSH scoring system, totaling 20 points distributed across functional, appearance, and subjective parameters. Parental satisfaction regarding function and appearance was assessed each using a 5-point Likert scale. Spearman's rank correlation assessed the relationship between the JSSH score and parental satisfaction, and receiver operating characteristic (ROC) curve analysis was used to determine the optimal cutoff value of the JSSH score corresponding to parental satisfaction.

Results: The JSSH score demonstrated a significant correlation with overall parental satisfaction. The optimal cutoff value for predicting parental satisfaction was determined to be 18.5, with an area under the ROC curve (AUC) of 0.82. The effect size between satisfied and unsatisfied parents was 1.26. Parents reported significantly lower satisfaction with appearance outcomes compared with functional outcomes. Notably, the appearance parameter of the JSSH score showed a weak correlation with appearance satisfaction, along with limited discriminative ability and a small effect size.

Conclusions: We noted a significant correlation between JSSH score and parental satisfaction in patients with radial polydactyly and established an optimal cutoff value of 18.5 points.

Clinical relevance: Future development of a scoring system that better integrates both functional and aesthetic consideration (social function) could enhance the evaluation and management of patients with polydactyly

A-0008 CHANGES IN PARENTAL STRESS AFTER SURGICAL TREATMENT OF RADIAL POLYDACTYLY: A SINGLE-CENTER RETROSPECTIVE STUDY

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Purpose: To quantify changes in parental distress after surgical correction of radial polydactyly and examine whether postoperative Parenting Stress Index–Parental Distress (PSI PD) scores correlate with Japanese Society for Surgery of the Hand (JSSH) scores, and to examine the relationship between PD scores and JSSH scores.

Methods: We retrospectively reviewed 58 patients treated for radial polydactyly at a single center between June 2020 and September 2022. Parents completed the PSI PD subscale preoperatively and 12 months postoperatively; surgeons recorded JSSH scores at postoperative follow up. Paired t tests compared pre and postoperative PSI PD scores. Independent t tests compared hypoplastic versus non hypoplastic cases. Spearman coefficients assessed associations between PSI PD change and JSSH scores. Within-subject change was tested and quantified with Cohen's d for paired samples. A distribution-based minimal clinically important difference (MCID) was estimated as $0.5 \times$ standard deviation of baseline PD.

Results: Mean PD decreased at 12 months, corresponding to a small-to-moderate effect. The distribution-based MCID was 4.1 points; 24 cases achieved at least this magnitude of improvement. High-stress prevalence declined from 12 preoperatively to 9 cases at follow-up. Hypoplastic and non hypoplastic types showed similar pre and postoperative PSI PD scores, although hypoplastic thumbs achieved higher JSSH scores. PD (preoperative, postoperative, or change) did not correlate with JSSH scores.

Conclusions: Parental distress decreases after surgical correction of radial polydactyly, but the average improvement is modest. Neither hypoplastic anatomy nor superior JSSH outcomes predicted greater stress relief, suggesting that the mere presence of polydactyly, rather than postoperative functional or aesthetic status, drives parental distress. This study also provides an initial, disorder-specific MCID benchmark for PD to guide interpretation and future trial design.

A-0009 WIRE FIXATION VIA CANNULATED SCREW (WVC METHOD) FOR DORSOULNAR FRAGMENT FIXATION IN DISTAL RADIUS FRACTURES: A PRELIMINARY REPORT

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Fixation of dorsoulnar fragments in distal radius fractures using volar locking plates alone may be insufficient when relying solely on screws. To address this, we developed a novel technique: Wire Fixation via Cannulated Screw (WVC method), and evaluated its utility in clinical practice. We retrospectively reviewed five patients with distal radius fractures involving dorsoulnar fragments who underwent volar locking plate fixation using the WVC method and had a minimum follow-up of six months. The WVC method employs the Global Form® volar locking plate (Nexmed international), which allows the use of cannulated screws. Specifically, the two most ulnar screws in the distal row are replaced with cannulated screws through which a suture is passed. This suture is then looped around the dorsoulnar fragment to secure it. Outcome measures included clinical findings at final follow-up (wrist range of motion, grip strength), radiographic parameters (correction loss in VT, RI, UV), complications (e.g., dorsal wrist pain, tendon injury), and CT evaluation of fragment displacement at six months postoperatively. Functional scores, DASH (JSSH version) and PRWE, were also assessed. The average size of the dorsoulnar fragments was 9.6 mm in width and 3.8 mm in height. CT at six months postoperatively showed no displacement of the fragments. At final follow-up, the mean DASH and PRWE scores were 18.9 and 16.1, respectively. Mean wrist range of motion and grip strength compared to the contralateral side were: pronation 97.8%, supination 95.6%, extension 57.8%, and flexion 61.2%. The average correction losses were: VT -0.64°, RI 0.67°, and UV +1.82 mm. No complications such as dorsal wrist pain or tendon irritation were observed. In conclusion, the WVC method is a simple, minimally invasive, and effective technique for securing dorsoulnar fragments that are difficult to stabilize with screws alone. This technique may serve as a valuable addition to current fixation strategies for distal radius fractures.

A-0010 QUANTIFYING SPLINT ADHERENCE USING NOVEL TEMPERATURE SENSORS: A PILOT STUDY

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Objectives: The core objective of the work to be presented is to introduce and validate a novel, objective technique for measuring patient adherence to removable splints using temperature sensors. The presentation would aim to address the critical gap in current research, which relies solely on unreliable self-report methods for adherence. It would specifically aim to demonstrate the relationship between self-reported splint use and actual use as measured by the sensors, and to assess the validity of self-report journals for determining splint wearing time.

Methodology: The presentation would detail the prospective cohort design involving 35 patients with elbow fractures/injuries receiving night-time elbow extension splints at the Roth McFarlane Hand & Upper Limb Centre (HULC). Key aspects of the methodology to be presented would include the embedding of small temperature sensors (Tempmate B-2) into custom-fabricated splints, deceiving patients about the sensor's true function (temperature recording vs. force measurement), and the collection of sensor data every 5 minutes over 4 weeks. The comparison of this objective data with patient self-report diaries, along with secondary outcomes like functional improvement, range of motion, and splint satisfaction, would also be covered.

Results (if applicable): While the full patient study is a pilot, the presentation would highlight the initial proof of concept testing completed by the investigators on three subjects, which confirmed the temperature sensor's accuracy (within five minutes) in measuring actual splint wearing time. This preliminary data forms the foundation for the broader pilot study and demonstrates the viability of the innovative method.

Significance: Presenting this research would underscore its high potential impact. It introduces the first study to quantify adherence to orthotic interventions of the elbow by measuring temperature change of the splint, offering an objective measurement where none previously existed. The significance lies in providing accurate quantitative data on splint use, which can inform optimal splinting dosages, improve clinical practice, and catalyze future high-impact research in various areas such as orthopaedic bracing, prosthetic adherence, and other wearable health technologies.

A-0011 REMOTE ORTHOTIC FABRICATION WORKFLOW USING 3D MODELLING AND 3D PRINTING TECHNOLOGY FOR CMC OSTEOARTHRITIS

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Introduction: This study introduces an innovative, comprehensive workflow for remote orthotic fabrication, combining web-based evaluation, mobile 3D scanning, and 3D printing technologies to enhance hand therapy outcomes for patients with carpometacarpal (CMC) osteoarthritis (OA). The objective was to develop a streamlined process that enables the creation of accurate, custom-fitted orthoses while improving accessibility, efficiency, and patient care.

Methods: The workflow was developed in five steps: a custom web-based application (Hand Scan) was created to evaluate pain, sensory function, and range of motion (ROM) in patients. We also used the smartphone's back camera to scan patients' hands and processed the scanned hands with Agisoft Metashape to generate accurate 3D models. These models were then adjusted using finite element analysis (FEA) software to reposition joints based on ROM data. Parametric modelling

software was used to design custom orthoses tailored to the patient's specific evaluation results from the hand scan app and therapeutic needs. Finally, orthoses were 3D printed using Orfit's modified Polycaprolactone (PCL) filament, chosen for its comfort and low thermoforming temperature.

To test the workflow's accuracy, a pilot study was conducted with five patients diagnosed with CMC OA. The content of the hand scan and its useability were tested via cognitive interview. The accuracy of the 3D hand scans was validated by comparing them to high-precision photogrammetry scans using root mean square error (RMSE) and maximum absolute deviation (MaxAD) metrics. The fit of the 3D-printed orthoses was evaluated by comparing surface deviations to those of traditional thermoplastic models.

Results: The Hand scan application demonstrated strong content validity, with healthcare professionals and patients affirming the system's clinical applicability and ease of use. Mobile scanning achieved a mean absolute deviation (MeanAD) of 0.93 mm (STDEV = 0.61 mm), within clinically acceptable limits for hand orthosis applications. The joint repositioning tool showed a mean surface deviation of 0.87 mm, indicating precise virtual joint-angle adjustments. 3D-printed orthoses outperformed traditional thermoplastic models, with a mean surface deviation of 0.95 mm compared to 1.96 mm for custom-made orthoses. Additionally, the maximum surface deviation for traditional orthoses was 5.81 mm, while 3D-printed orthoses showed a maximum deviation of 3.17 mm. These results validate the accuracy of both the mobile scanning and 3D printing process in providing personalized, custom-fit orthoses for patients with CMC OA.

Conclusions: This innovative, fully remote workflow offers a practical, scalable solution for fabricating custom orthoses for patients with CMC OA, demonstrating strong clinical applicability and precision. By reducing the need for in-person visits, this approach enhances patient care accessibility and efficiency, with significant implications for telehealth and hand therapy. Further studies with more diverse populations are needed to refine the system and explore its broader clinical adoption

A-0012 ESTABLISHING CLINICAL CONSENSUS ON ORTHOSIS USE FOR CMC OSTEOARTHRITIS: A DELPHI SURVEY OF GLOBAL HAND THERAPISTS

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Study Design: Modified Delphi study.

Introduction: Although orthotic intervention is widely recommended for managing thumb carpometacarpal (CMC) osteoarthritis, clinical practice varies substantially, and existing guidelines often lack specificity regarding indications, design, and material selection. This study aimed to establish expert consensus on evidence-informed and practice-driven orthotic prescription patterns for individuals with CMC OA.

Purpose of the Study: To identify and define consensus-based clinical decision-making criteria for orthosis use in CMC OA, including indications, design features, materials, wear schedules, and implementation barriers.

Methods: Thirty-two international hand therapy and surgery experts participated in a two-round modified Delphi process. Participants rated agreement with 96 items across domains such as orthotic indications by disease stage, symptom severity, joint involvement, thumb positioning, material properties, and real-world constraints. Items reaching $\geq 75\%$ agreement were considered consensus.

Results: Consensus was achieved on 72 items. Experts strongly supported orthotic use in Stage 2 CMC OA, notably when activity-related pain exceeded 4/10 or when joint instability compromised function. For Stage 1, education and joint

protection were prioritized before the orthotic intervention. Thumb positioning in palmar abduction and opposition with ~30° MCP flexion was recommended. The CMC joint was always immobilized, while MCP or wrist inclusion was symptom- and deformity-dependent. Breathable, rigid thermoplastics (e.g., Aquaplast, Orfit Classic) were preferred for structural correction, whereas softer materials like neoprene were favoured for prolonged use or early-stage OA. Several orthosis patterns were reported in practice, including Short Opponens, Thumb Spica, Butterfly, and newer designs such as Whale and Collidotz orthoses. Real-world constraints were consistently highlighted, including limited material access, reimbursement barriers, and patient adherence issues.

Conclusion: This study provides a clinically actionable, expert-informed framework for orthotic management in CMC OA. The findings offer a nuanced snapshot of real-world practice that extends current evidence by specifying orthotic indications, design features, and material choices tailored to disease stage and patient profile. These results can guide clinical decision-making, enhance educational resources, and inform future orthotic effectiveness and implementation research.

Keywords: Thumb osteoarthritis; Carpometacarpal joint; Hand therapy; Orthotic design; Thermoplastic orthosis; Delphi study; Material selection; Patient-centered care

A-0013 EXPLORING USER EXPERIENCES WITH THERMOPLASTIC AND 3D-PRINTED THUMB SPLINTS: A QUALITATIVE STUDY EMBEDDED IN A CROSSOVER RCT

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Study Design: Qualitative study embedded within a crossover randomized controlled trial.

Introduction: Orthoses are widely prescribed for thumb carpometacarpal (CMC) osteoarthritis. While 3D-printed orthoses are emerging as lightweight, breathable, and digitally reproducible alternatives, little is known about how patients experience these devices compared with conventional thermoplastic orthoses.

Purpose: To explore patient experiences, satisfaction, adherence, and functional support when using 3D-printed and thermoplastic thumb orthoses for CMC osteoarthritis.

Methods: Seventeen participants (20 hands) with CMC osteoarthritis completed both phases of a crossover RCT, wearing a custom-fabricated thermoplastic orthosis and a 3D-printed orthosis in randomized order. Semi-structured interviews were conducted following each two-week phase and supplemented by daily wear diaries. Data were analyzed using the Interpretive Description methodology.

Results: Thematic analysis identified six experiential domains: fit and comfort, ease of use, functional effectiveness, aesthetics and social acceptability, satisfaction, and adherence. Thermoplastic orthoses were valued for stability and reliability in daily tasks, but sometimes caused skin irritation. 3D-printed orthoses were praised for their aesthetics, lightness, and breathability, but were often perceived as less supportive for high-demand activities. Adherence was generally higher with thermoplastic orthoses.

Conclusion: Patients balance functional support against aesthetic and social considerations when choosing between thermoplastic and 3D-printed orthoses. Thermoplastic devices remain the preferred choice for daily tasks, whereas 3D-printed orthoses are favoured in social settings. These findings highlight the importance of individualized prescription and shared decision-making to optimize satisfaction and adherence, supporting the complementary, not replacement, role of 3D-printed orthoses in clinical practice.

A-0014 PSYCHOLOGICAL AND RADIOLOGICAL CONTRIBUTIONS TO PERSISTENT PAIN AND DISABILITY AFTER DISTAL RADIUS FRACTURES: A MEDIATION AND MODERATION ANALYSIS

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Background: Persistent pain and disability after distal radius fracture (DRF) remain common despite good anatomical restoration. While radiological parameters are traditionally used to guide postoperative evaluation, emerging evidence suggests that psychological factors may also be associated with outcomes within the first year. However, few studies have directly compared the relative contributions of these domains.

Questions/Purposes:

This study aimed to:

- (1) examine the associations of radiological parameters and psychological factors with persistent pain and disability after DRF;
- (2) explore whether psychological factors were linked to the relationship between radiological deformities and clinical outcomes; and
- (3) Consider clinical implications for optimizing rehabilitation strategies.

Methods: We conducted a retrospective cohort study of all consecutive patients with distal radius fractures (DRF) treated operatively by a single surgeon. Hospital records were reviewed to identify eligible patients, and 88 agreed to participate when contacted for follow-up; 79 completed the one-year assessment and were analyzed. Patients completed the Patient-Rated Wrist Evaluation (PRWE), Pain Catastrophizing Scale (PCS), Tampa Scale for Kinesiophobia (TSK), and Depression, Anxiety, and Stress Scale (DASS-21). Radiological measures included radial height, inclination, and palmar tilt. Hierarchical multivariable regression, with exploratory moderation and mediation models, was conducted to evaluate associations with pain and disability.

Results: Radiological parameters accounted for a small proportion of variance in pain (2.9%) and disability (3.8%). Postoperative radial height was associated with pain, and radial inclination with disability. In contrast, psychological factors—particularly pain catastrophizing and kinesiophobia—were strongly associated with both pain (71.2%) and disability (77.5%) ($p < 0.001$). Exploratory analyses suggested psychological variables were linked to, but did not fully explain, the relationships between radiological measures and outcomes.

Conclusions: Postoperative anatomical alignment alone was not sufficient to account for patient outcomes. Within the first year after surgery, psychological factors showed stronger associations with pain and disability than radiographic parameters. These findings highlight the potential value of incorporating psychological assessment and support alongside physical rehabilitation, although confirmation in larger prospective studies is needed.

A-0015 IDENTIFYING ERGONOMIC VULNERABILITIES IN CARPAL TUNNEL SURGERY

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Aim: To assess and identify the ergonomic risks of surgeons performing Carpal Tunnel Release surgeries

Methods: Surgeon posture during open carpal tunnel release was recorded using the Xsens MVN Awinda system with 17 wireless IMU sensors. Motion data were processed in MVN Analyze to derive joint kinematics, and ergonomic risk was quantified using the Rapid Upper Limb Assessment (RULA). Each case was analyzed from incision to wound closure. **Results:** N = 25, analysis demonstrated sustained non-neutral postures of the neck and trunk in the majority of cases. RULA scores indicated moderate to high ergonomic risk, with the neck frequently flexed >20° for prolonged durations. Trunk posture showed repeated forward inclination, contributing to elevated cumulative risk scores. The impact of maladaptive positioning on surgeon function was assessed using the Extended Nordic Musculoskeletal Questionnaire (NMQ-E), Neck Disability Index (NDI) questionnaire and Brief Resilience Scale (BRS).

Conclusion: Use of wearable motion capture identified consistent ergonomic strain on the neck and trunk during carpal tunnel surgery. These findings highlight the need for ergonomic interventions in hand surgery, including surgeon positioning, instrument design, and operating room setup, to reduce long-term musculoskeletal risk.

A-0016 PREOPERATIVE THERAPY FOR DUPUYTREN'S FASCIOTOMY: EARLY FEASIBILITY FINDINGS ON ACCEPTABILITY, DELIVERY, AND OUTCOMES

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Background: While preoperative interventions are well established in lower-limb orthopaedics (1), their role in hand surgery is largely unexplored. Previous work, including a systematic review (2), a survey of UK hand therapists (3), and a patient and public involvement (PPI) study (4), identified Dupuytren's fasciectomy as the priority procedure most likely to benefit from preoperative therapy. Building on these findings, a feasibility study was designed to evaluate the acceptability and practicality of delivering preoperative therapy prior to Dupuytren's fasciectomy.

Methods: A single-centre feasibility study is in development to investigate preoperative serial casting, stretching, and massage therapy in patients undergoing Dupuytren's fasciectomy with severe PIP joint contracture. Outcomes include feasibility metrics such as recruitment, retention, adherence, intervention reliability, and data completeness; acceptability measures such as patient-reported satisfaction, treatment burden, and willingness to participate in a future trial; clinical outcomes including range of motion (ROM), Michigan Hand Questionnaire (MHQ) scores, grip strength, and complication rates; and qualitative feedback gathered through semi-structured interviews with patients and therapists to explore barriers and enablers.

Results: Preliminary findings to be presented will include recruitment and eligibility rates to determine feasibility of patient identification and enrolment; acceptability data, including patient preferences for delivery format and tolerability of interventions; therapist feedback on clinical relevance alongside resource and time implications; trial processes including feasibility of screening and baseline data collection within surgical pathways and rates of data completeness; and clinical outcomes with early trends in ROM, MHQ, and grip strength.

Conclusion: This feasibility study is expected to provide critical insights into the practicalities and acceptability of delivering preoperative therapy for Dupuytren's fasciectomy. Early findings will highlight patient and therapist engagement, logistical challenges, and the feasibility of capturing outcome measures within routine surgical pathways. NHS REC ethics approval is in progress, with recruitment planned from December 2025 and preliminary results anticipated by May 2026. Insights from this study will directly inform the design and delivery of a future multicentre randomised controlled trial to test clinical effectiveness.

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A-0017 MINIMALLY INVASIVE CHEMICAL DENERVATION FOR BASILAR THUMB ARTHRITIS: A CADAVERIC FEASIBILITY STUDY

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Background: Surgical denervation of the trapeziometacarpal (TMC) joint is emerging as a surgical alternative for patients with advanced basilar thumb (CMC) osteoarthritis.¹ However, the current literature demonstrates mixed efficacy and there is no consensus on longer-term results.² Chemical denervation has existed as a minimally invasive method for treating both motor and sensory disease in a wide variety neuromuscular and musculoskeletal pathologies.³ This, however, has not yet been applied to the small joints of the upper extremity. This study aims to determine the feasibility of minimally invasive denervation for the treatment of basilar thumb osteoarthritis.

Methods and Materials: Under ultrasound guidance, 0.5-1cc of a mixture of phenol, glycerin, and methylene blue was injected into three intact, unembalmed cadaver wrists into the TMC joint using a 22-gauge needle. Dissection of the TMC joint capsule was performed to visualize dispersion and confirm intracapsular containment.

Results: Intra-articular accuracy was confirmed in all three specimens (100%), both under ultrasound visualization and direct visualization after dissection. Soft tissue extravasation was noted in one of the three specimens (33%) after dissection. In the last specimen, injectate was found adjacent to the capsule, staining the ARL and EPB tendons.

Conclusion: This study's accuracy rate for intra-articular injection was comparable to rates reported in other basilar thumb joint injection studies.⁴ There was relatively high soft tissue extravasation, though this was most likely due to operator error. Minimally invasive ultrasound guided chemodenervation of the basilar thumb joint shows promise, and future studies should expand upon these findings in further cadaver or human subject research.

A-0018 ULTRASOUND-GUIDED QUAD NERVE WRIST DENERVATION: A CADAVERIC FEASIBILITY STUDY

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Background Surgical denervation of the wrist is gaining popularity for wrist osteoarthritis. However, for patients who cannot or choose not to undergo surgery, therapeutic options are more limited. Chemical denervation has existed as a minimally invasive method for treating both motor and sensory disease in a wide variety of patients and pathologies. This, however, has not yet been applied clinically to the small joints of the upper extremity. This study aims to determine the feasibility of minimally invasive denervation for the treatment of wrist osteoarthritis. **Methods and Materials** Under ultrasound guidance, 2.5cc of a mixture of phenol, glycerin, and methylene blue was injected into six unembalmed cadaver wrist specimens. The anterior interosseous (AIN), posterior interosseous (PIN), superficial branch of radial (SBRN), and lateral antebrachial cutaneous (LABCN) nerves were targeted through two injection sites. Dissection of the anterior and posterior forearms were performed to confirm and objectively measure nerve staining and visualize dispersion. **Results** Dissection showed successful injectate dispersion along all four nerves. AIN dispersion was 1.9cm $\pm$ 0.9cm along the nerve with a total injectate dispersion area of 2.6cm² $\pm$ 0.6cm² between the pronator quadratus and interosseous membrane (IOM). PIN dispersion was 4.2cm $\pm$ 2.9cm with 7.4cm² $\pm$ 9.8cm² dispersion between the fourth extensor compartment and IOM. SBRN dispersion was 6.4cm $\pm$ 2.2cm with 16.1cm² $\pm$ 12.8cm² spread deep to the brachioradialis muscle. LABCN dispersion was 4.2cm $\pm$ 1.2cm with 15.2cm² $\pm$ 14.3cm² spread superficial to the brachioradialis muscle. This dispersion spared the radial artery and the main motor branches of the AIN and PIN. When the LABCN was injected in isolation, no spread to the SBRN was observed. **Conclusion** Minimally invasive ultrasound guided chemodenervation of the wrist with a phenol-glycerin mixture shows promise in targeting the majority of sensory distribution of the wrist without significant spread to surrounding neuromuscular and neurovascular structures.

A-0019 QUANTITATIVE EVALUATION OF THE POSTOPERATIVE ATROPHY OF THE AMPUTATED FINGERTIPS REPLANTED BY SUBCUTANEOUS POCKET METHOD

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Introduction: Replantation surgery for the fingertip amputations has become common due to advances in microsurgeries. Vascular anastomosis is often not possible, and in such cases subcutaneous pocket method is a very useful surgical technique. However, the fingertips may atrophy after the subcutaneous pocket method, and additional surgical treatments may be required for soft tissue atrophy. There are few papers quantitatively examine the postoperative atrophy after the subcutaneous pocket methods. In this study, we investigated postoperative fingertip atrophy after the subcutaneous pocket methods and compared it with the vascular anastomosis.

Methods: For 71 fingers that had been replanted by the subcutaneous methods and survived, the soft tissue of the fingertips at least 3 months after surgeries were compared with that of the healthy side or immediately before surgeries. The evaluations are based on the X-lay images, and the distance from the fingertip to the tip of the distal phalanx (A), the width at the tip of the distal phalanx (B), the maximum distance from the distal phalanx to the finger pad (C) and the width at that point (D) are measured. The ratio of each distance to the healthy side was calculated.

The similar measurements were performed on 31 fingers that had been replanted by the vascular anastomosis.

Results and Discussions: Of the 71 fingers that underwent the subcutaneous pocket methods, 51 fingers are subzone 2 and

20 fingers are subzone 3 (Ishikawa's subzone classification). The results were A: 0.45 ± 0.08 , B: 0.62 ± 0.09 , C: 0.78 ± 0.08 , D: 0.85 ± 0.06 . Postoperative atrophy was more severe in the fingertips than in the finger pads. Fingers reattached by the subcutaneous pocket method are nourished by blood flow in a random pattern, which is thought to result in severe atrophy at the fingertips.

Of the 31 fingers that underwent the vascular anastomosis, 5 fingers are subzone 2, 7 fingers are subzone 3 and 19 fingers are subzone 4. The results of the replantation by vascular anastomosis were A: 0.65 ± 0.15 , B: 0.78 ± 0.14 , C: 0.88 ± 0.09 , D: 0.92 ± 0.06 . Although there are differences in cutting levels, there are significant differences between the subcutaneous pocket method and vascular anastomosis. The difference in atrophy rate is especially large in the fingertips.

There was more variability in the postoperative atrophy rate after vascular anastomosis compared with the subcutaneous pocket method. This result may be due to the fact that some cases experienced severe atrophy due to vascular occlusion after surgery, while others did not experience significant atrophy.

Conclusion: Replantation by the subcutaneous pocket method tended to result in greater postoperative atrophy than replantation by vascular anastomosis. Further, atrophy was most pronounced in the fingertips, demonstrating for the first time that atrophy in replantation fingers varies by site.

A-0025 VOLAR PLATING VS COMBINED PLATING FOR AO TYPE C DRF: A 5-YEAR FOLLOW-UP OF 135 PATIENTS IN A RANDOMIZED CONTROLLED STUDY

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Introduction: Distal radius fractures (DRF) are the most common fractures in adults. Treatment is divided into surgical and non-surgical and chosen from the patients' needs and fracture pattern. Volar plating is the most common fixation method for distal radius fractures. Combined plating with a volar and dorsal plate is an option for more complex fractures where dorsal stability is needed, for example for stabilization of the dorsal ulnar corner fragment. The purpose of this study is to follow-up 150 patients after an AO type C DRF that were randomized to volar plating or combined plating five years postoperatively. The patients radiographic and clinical outcomes were evaluated.

Method: One hundred and fifty patients with AO type C DRF were previously randomized to a volar locking plate or combined plating, with strict inclusion and exclusion criteria. The data from the one-year follow-up has been published (Lundqvist et al 2022). All participating patients were invited for a 5-year postoperative follow-up. Radiographs, VAS, grip strength, range of motion was documented in controlled fashion, along with the PRWE, QuickDASH and EQ-5D questionnaires. Arthrosis in the radiocarpal and distal radioulnar joint was graded on radiographs by a senior radiologist according to the Knirk and Jupiter classification.

Results: A total of 135 patients (66 in the volar group and 69 in the combined plating group) were followed up five years postoperatively, corresponding to a 90% follow-up rate. The median age at follow-up was 67 years, and there was no significant difference in the two groups regarding gender, fracture type, if the dominant hand was injured and injury side. There was no difference in osteoarthritis grade outcomes between the two groups. In terms of clinical outcome, the volar plate group had significantly better outcomes regarding flexion (75° vs 60°), extension (65° vs 55°), radial deviation (25° vs 20°) and PRWE (median 1 vs 6 points) at 5 years ($p < 0.05$). This is in line with the one-year data that has been published for this cohort. The differences in Quick DASH (2.3 in both groups), EQ-5D index and EQ-VAS between the groups were non-significant. Hardware removal was significantly more common in the combined plating group 64% vs 30% in the volar plate group.

Conclusion: At 5 years postoperatively patients with AO type C DRF, treated surgically and operated with volar plating had superior clinical outcomes compared with combined plating and a significantly lower rate of hardware removal. Although the minimal clinically important difference was not reached. Radiographic results regarding posttraumatic arthrosis development showed no significant difference between the groups. On a group level, no advantage of combined plating was noted, and volar plating remains the preferred method for these fractures.

A-0026 NORTH MIDLANDS HAND CENTRE: REFLECTIONS ON DEVELOPING A NEW SERVICE

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The development of a new hand surgery hub in the UK offers a critical opportunity to not only address the elective backlog but also to transform service delivery through a deeply patient- and staff-centred approach. While quantitative metrics are crucial for measuring efficiency, the true measure of success lies in the lived experiences of those who use and work within the service.

This project is designed to assess the human factors behind the development of a new surgery hub by placing qualitative feedback from both staff and patients at the core of its continuous improvement strategy. Going forward the hub will integrate a robust qualitative research framework to capture the rich, contextual nuances of the patient journey and the staff experience.

The methodology will employ qualitative methods to ensure a comprehensive understanding of the hub's impact. For patients, this will include pre- and post-operative questionnaires to explore their perceptions of care, communication, and overall experience. By focusing on specific 'touchpoints'—such as the clarity of pre-operative information, the experience of regional anaesthesia, and the experience of the whole visit—the hub will capture critical insights that quantitative surveys often miss.

For staff, feedback will be collected through informal conversations, and a pre and post placement questionnaire to capture anonymous, unsolicited comments. This will facilitate an open and transparent dialogue, addressing concerns about workload, training opportunities, and the psychological impact of working in a high-volume, hand surgery-only environment. By involving staff from all levels in co-design and quality improvement cycles, the hub will cultivate a culture of psychological safety and shared ownership, directly linking their experiences to actionable service changes. The systematic analysis of this rich qualitative data will inform service adaptations, ensuring the hub is not only efficient but also humane, equitable, and responsive to the needs of its users. The findings will provide a powerful narrative for stakeholders, demonstrating how a dedicated hand surgery hub, informed by genuine staff and patient voices, can deliver exceptional care and become a replicable exemplar for other surgical services within the NHS.

A-0027 THE CLOSED MANAGEMENT OF THE LOCKED MCPJ

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Background: A locked metacarpophalangeal (MCP) joint is a rare and distinct condition characterized by the sudden, mechanical inability to extend a finger. It is frequently misdiagnosed as "trigger finger," a more common condition caused by tenosynovitis of the flexor tendon.

In contrast, a true locked MCP joint involves an intra-articular derangement, where the collateral ligament becomes entrapped behind a bony prominence on the metacarpal head, preventing the joint from straightening. Effective management requires a clear diagnostic pathway and a step-wise approach to treatment, ranging from conservative methods to surgical intervention.

The key differentiating feature is the inability to achieve both active and passive extension at the MCP joint, while interphalangeal joint motion may be preserved.

Radiographic imaging is crucial for identifying the underlying cause.

Management of a locked MCP joint typically follows a protocol beginning with a trial of closed reduction.

While successful in a significant number of cases, failed closed reduction is not uncommon. For these irreducible dislocations surgical intervention is indicated.

Surgical treatment involves an open palmar incision excising the bony prominence or fracture fragment that is causing the impingement.

Early diagnosis and appropriate management are critical to prevent long-term disability and fixed flexion contracture.

Introduction and Aims: We present two cases that have been managed at the North Midlands Hand Centre (NMHC) in the United Kingdom that were managed non-operatively and demonstrate how our management differs from the literature.

Methods: Two patients, a 60-year-old lady and a 23-year-old lady, presented with acute locking at the MCP joint of the middle and index fingers respectively. Both were performing trivial tasks with no recent history of trauma or recent locking. A history and examination of both patients confirmed locking at the MCP joints with the interphalangeal (IP) joints unaffected and tenderness on passive stretching at the MCP joint. Both patients had tried to leave this for days with no resolution of locking. Radiographs performed showed no obvious changes.

Results: Both patients were managed at the NMHC, a specialised hand centre, for a trial of closed reduction. The affected MCP joints were injected with local anaesthetic under image intensifier guidance, insufflating the joint followed by gentle manipulation. In both cases, a palpable click was felt with immediate resolution on the table that was demonstrated by the patients. Computerised tomography (CT) scans performed post-operatively showed osteophytes in the metacarpal head for the 60-year-old lady and prominence of the metacarpal head for the 23-year-old lady. At 3 months follow-up, both patients had no further episodes of locking and were discharged to open follow-up.

Conclusion: In the literature, patients immediately underwent open reduction or had a trial of blind injection performed followed by open reduction if this failed. Our study has shown that patients can be managed with closed technique in the first instance with a local anaesthetic injection performed under image intensifier, preferably in the presence of a hand specialist, before considering open reduction.

A-0028 RETURN TO WORK AFTER TOTAL SHOULDER ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Return to work (RTW) is a critical outcome for working-age patients undergoing total shoulder arthroplasty (TSA). Although TSA consistently improves pain and function, less is known about how these clinical gains translate into occupational recovery.

Objective: To synthesize evidence on RTW after TSA and identify predictors across surgical, occupational, and patient-related domains, while summarizing secondary outcomes including time to RTW, function, pain, satisfaction, complications, and revision.

Methods: MEDLINE, ScienceDirect, and Cochrane Library were searched through March 8, 2025. Fourteen retrospective studies (n = 3,134) were included. Predictors were categorized into five groups: work-related, surgical, clinical/functional, demographic, and psychosocial. Two reviewers independently extracted data and assessed study quality using the ROBINS-I tool; the certainty of evidence was graded using the GRADE approach. Pooled estimates were generated with random-effects models. PROSPERO: CRD42024579124.

Results: Overall, 75% (95% CI, 64–84%) of patients returned to work after TSA, typically within 3.0 months (95% CI, 1.5–4.5). RTW rates were higher following anatomic TSA (84%) than reverse TSA (61%), but subgroup differences were not statistically significant, and the certainty of evidence was low. By occupational demand, RTW was significantly higher in sedentary/light and medium-intensity jobs compared to heavy labour (p = 0.008). Workers' compensation was consistently associated with markedly lower RTW (13–32% vs 41–73% in non-compensated cohorts). Demographic and clinical predictors, including age, sex, and comorbidities, showed inconsistent associations. Secondary outcomes demonstrated substantial improvements in function (ASES SMD 2.18) and pain (VAS SMD –2.47), as well as high satisfaction rates (83%), and complication and revision rates of 18% and 9%, respectively.

Conclusion: Approximately three-quarters of patients return to work after TSA, usually within the first three months. Occupational intensity, compensation status, and procedure type appear to influence outcomes; however, the certainty of evidence is low, and no firm conclusions can be drawn regarding surgical superiority. Standardized RTW definitions, prospective designs, and integration of psychosocial and workplace variables are required to strengthen future evidence and inform patient counselling.

A-0030 INTRAOPERATIVE AUTOFLUORESCENCE IMAGING: A NEW TOOL FOR RHEUMATOLOGIC HAND SURGERY

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Background: Precise intraoperative differentiation between healthy and pathological tissue remains a challenge in rheumatologic hand surgery. We present a sterile, no-touch technique for real-time tissue characterization using ultraviolet (UV)-induced autofluorescence (AF) with near-UV excitation at a peak wavelength of 395 nm to elicit endogenous tissue fluorescence.

Methods: AF imaging was conducted intraoperatively in nine patients with inflammatory rheumatic disease and two with degenerative arthritis, yielding 36 paired AF and white-light images for analysis. Image acquisition was performed under strict sterile conditions without interference with the surgical workflow.

Results: Healthy tendons and cartilage exhibited a consistent bluish-white AF signal, visible to the naked eye and photographically documented, whereas pathological tissues showed characteristic alterations. In regions of inflammatory synovial proliferation, AF was completely extinguished. The technique proved feasible, reproducible, and compatible with routine surgical workflow, requiring only minimal additional instrumentation. Although a second person was needed for UV illumination and image capture, sterility was preserved and interference with the procedure remained negligible. AF imaging enabled real-time identification of residual pathological tissue and supported intraoperative decision-making, particularly during synovectomy. Moreover, it allowed precise visualization of structurally altered tendons and facilitated assessment of tendon integrity, guiding decisions on augmentation or transfer. Degenerative cartilage changes were also reliably detected, including alterations not apparent under white light, thereby adding further value to intraoperative evaluation.

Conclusion: By enabling real-time identification of inflammatory remnants, tendon alterations, and early cartilage degeneration, this technique may significantly enhance surgical precision in rheumatologic hand procedures.

A-0032 ARTHROSCOPIC TRANSOSSEOUS SUTURETAPE VERTICAL SIMPLE REPAIR FOR TFCC FOVEAL TEARS: A CASE SERIES HIGHLIGHTING EARLY MOBILIZATION

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Purpose: To evaluate the clinical outcomes of arthroscopic transosseous vertical simple repair using flat-braided SutureTape (Arthrex) for triangular fibrocartilage complex (TFCC) foveal tears, with particular focus on the feasibility of reducing postoperative immobilization.

Surgical technique: An interosseous hole was created using a 2.4-mm cannulated drill bit by the standard technique. A microsuture lasso was passed through the interosseous hole and penetrated the center of the TFCC. The guide wire was retrieved through the 6U portal. A SutureTape was then loaded onto the guide wire, and one end of the tape was introduced into the joint and passed through the TFCC fovea. Finally, both ends were secured to the ulna using the SwiveLock (Arthrex) system.

Methods: A retrospective case series was conducted on 15 consecutive patients (mean age, 29 years; range, 17–45; 9 males, 6 females) who underwent arthroscopic transosseous SutureTape repair for TFCC foveal tears between 2019 and 2024. The mean follow-up was 12 months. Postoperative immobilization protocols were progressively shortened, from 4 weeks in early cases to 0–2 weeks in later cases. Outcome measures included pain on the Visual Analog Scale (VAS), grip strength, Mayo Wrist Score, Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) score, and distal radioulnar joint (DRUJ) stability.

Results: All patients demonstrated Palmer Type 1B TFCC tears with foveal disruption. At final follow-up, significant improvements were observed in VAS pain scores (6.0 ± 0.8, $p < 0.01$), QuickDASH (46 ± 5, $p < 0.01$), and Mayo Wrist Score (58 ± 91, $p < 0.01$). Grip strength improved from 65% to 92% of the contralateral side. DRUJ stability was restored in all cases. No surgery-related complications occurred. Importantly, outcomes in patients treated with minimal or no immobilization were comparable to those with traditional 4-week immobilization, suggesting that prolonged casting may be unnecessary.

Conclusions: Arthroscopic transosseous vertical mattress repair using flat-braided SutureTape provides reliable fixation, reduces the risk of suture cut-through, and achieves consistent restoration of DRUJ stability with excellent functional outcomes. Shortened or eliminated immobilization may accelerate return to work and sports, offering substantial clinical benefits.

A-0033 ULTRASOUND-GUIDED ANTEROGRADE CARPAL TUNNEL RELEASE: ANATOMICAL LANDMARKS OF THE DISTAL BOUNDARY – A CADAVERIC STUDY

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Background: Carpal tunnel syndrome (CTS) is the most common peripheral entrapment neuropathy. Anterograde ultrasound-guided carpal tunnel release is now a widely adopted technique. However, identifying the distal limit of the transverse carpal ligament (TCL) on a longitudinal view remains challenging. This study investigates whether the 'V'-shaped structure seen on longitudinal ultrasound can serve as a reliable landmark for complete TCL release.

Materials and methods: Ten fresh cadaveric upper limbs were examined. Four anatomical landmarks were identified and marked under ultrasound guidance, including the distal end of the 'V'-shaped structure seen on longitudinal view. An

ultrasound-guided anterograde release of the transverse carpal ligament was then performed, advancing the instrument to the distal end of the V-shaped sonographic image. A final anatomical dissection verified the correspondence between ultrasound landmarks and underlying structures, particularly the superficial palmar arch.

Results: The distal end of the 'V'-shaped structure was consistently located distal to Kaplan's line and trapezium–hook of hamate line. It averaged 6.8 mm from the superficial palmar arch. In 5 of 10 cases, this distance was ≤ 5 mm, and in one case, the section came into contact with the superficial palmar arch without causing injury.

Conclusion: The 'V'-shaped structure extends beyond the anatomical limits of the carpal tunnel, placing the superficial palmar arch at potential risk if used as a distal landmark during ultrasound-guided anterograde release. Therefore, it should not be considered a reliable guide for complete ligament transection.

A-0035 THE APTIS DRUJ PROSTHESIS – RETROSPECTIVE RESULTS FROM A SINGLE SURGEON SERIES

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Background: We aim to present our results with the use of the APTIS DRUJ prosthesis in a series of 18 patients (19 hands) in a course of five years

Materials and Methods: This is a retrospective study. From March 2020 to October 2025 we operated on 18 patients and 19 hands using the APTIS DRUJ total joint replacement implant. Reason for the procedure was obstetric brachial plexus palsy (one patient), malunion of distal radius fracture (two patients), failed Sauve Kapandji procedure (one patient), multiple failed surgeries for Madelung deformity with subsequent DRUJ instability (one patient) and distal radioulnar joint arthritis (rest of the patients). We used the VAS scale for pain and also the mean ROM of pronosupination before and after the procedure

Results: Four patients were unhappy with the results of the procedure. One suffered an implant loosening due to malpositioning of the implant (and subsequently had an implant explantation). One patient suffered a periprosthetic stress fracture of the distal radius six weeks post op. Two patients had a loosening of the ulnar stem but opted not to have anything done. Two patients had seen a significant improvement regarding the range of pronosupination of their forearm. The rest of the patients in our series saw an improvement in the pain they had following the procedure.

Conclusions/discussion : We have found that the APTIS DRUJ replacement is a very good choice for patients with pain or limitation of pronosupination of the forearm as well as with DRUJ arthritis, however it is a very technically demanding procedure. Therefore, we have the following recommendations:

1. Radial plate positioning is vital. Take time to fashion your radius and make sure that your trial plate sits perfect on the AP and lateral XRs prior to drilling.
2. In osteoporotic patients and patients with large diameter of ulnar canal, the ulnar implant might become loose easily. We have found that the harvest of a corticocancellous graft from the excised ulnar head to use both as a stopper and to fit the canal, along with the use of bone substitute works very well to prevent this complication. As an alternative, the use of a large diameter corticocancellous bone graft from the excised ulnar head, in the absence of bone substitute, can be used to pack the ulnar canal and make the ulnar stem better impacted. This is our go to method in osteoporotic patients and patients with big anatomy
3. For patients with attritional ruptures of the extensor or flexor tendons (especially long standing), consider staging the procedure or be prepared to use tendon grafts to achieve optimal results. However, such a procedure can be time consuming.

A-0036 THE POTENTIAL ROLE OF EPLET MATCHING IN VASCULARIZED COMPOSITE ALLOTRANSPLANTATION

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Introduction: Eplet matching represents a paradigm shift in transplant immunology, refining donor-recipient HLA compatibility assessment by focusing on specific polymorphic amino acid clusters rather than whole antigens. In solid organ transplantation, especially kidney transplantation, reduced eplet mismatches have been associated with lower risks of de novo donor-specific antibody (dnDSA) formation and improved graft survival. In vascularized composite allotransplantation (VCA) - including extremity and face transplantation - particularly high allograft immunogenicity, associated with frequent rejections and a high immunosuppressive burden, as well as the elective character of these reconstructive transplantations demand best possible immunogenic risk stratification and donor selection.

Methods: Eplet-based mismatches of ten face transplantations, conducted within 2009-2020, were assessed with the HLA Matchmaker program while T cell-mediated alloimmunity was predicted with the PIRCHE (Predicted Indirectly Recognizable HLA Epitopes) algorithm. One case involved a facial re-transplantation due to severe chronic rejection. For this patient eplet matching for both respective donors were performed. The tissue used for these analyses included frozen PBMCs of recipients and frozen donor lymph nodes provided by the New England Donor Services. The relative cumulative rejection burden was calculated as the product of the total amount of days of all bioptically verified rejection episodes since transplantation (defined as Banff scores ≥ 2) multiplied by the weighted average Banff score of each rejection episode divided by the sum of years since transplantation ($CRB = \text{Total rejection days} \times \text{weighed average Banff score} / \text{years since transplantation}$). Statistical analysis of eplet mismatching and PIRCHE results with respective CRBs was performed. Established high-risk HLA mismatching thresholds associated with dnDSA development in kidney transplantation were included in the statistical analysis.

Results: HLA Matchmaker analysis detected a mean overall mismatching of 31.36 HLA Class I (range 0-66), 41.09 class II (range 0-79), 11.55 HLA-DQ (range 0-27), and 19.45 HLA-DRB1 and -DRB345 (range 0-42) molecules. The mean PIRCHE score was 58.09 (range 0-111).

In the single case of facial re-transplantation high mismatching scores were found between the recipient and the first rejected allograft (HLA-DQ: 9, HLA-DRB1, -DRB345: 25, PIRCHE: 102) while zero mismatching was present between the recipient and the second allograft donor (HLA-DQ: 0, HLA-DRB1, -DRB345: 0, PIRCHE: 0). Simple linear regression and correlation models revealed a significant positive linear relationship between CRB and HLA-A mismatching ($r=0.7664$, $R^2=0.5874$, $p=0.0097$). Differentiation between low-/high-risk HLA-DQ, -DRB1/-DRB345 mismatch thresholds HLA-DR < 7 and HLA-DQ < 9 revealed two transplantations with low alloimmune risk with a mean CRB of 19.48, one case of intermediate alloimmune risk (≥ 7 HLA-DR and ≥ 9 HLA-DQ eplet mismatches) with a mean CRB of 32.52 and seven high-risk mismatching results with a mean CRB of 91.88.

Conclusion: The results of this first piloting study show a correlation of low eplet mismatching with low CRB in VCA, suggesting great clinical potential of eplet matching for optimizing donor selection as well as individualized risk assessment and tailored immunosuppression in VCA recipients. More data from larger studies is needed to verify the potential clinical value of eplet matching in VCA and further explore the specific role of HLA-A in VCA.

A-0037 THE EFFECTS OF SMOKING ON THE MANAGEMENT OF SCAPHOID ACUTE FRACTURES AND NON-UNIONS – A SYSTEMATIC REVIEW

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Introduction: Scaphoid non-union rates can be as high as 2-5%, of which smoking may play a big part. This systematic review aimed to identify the extent of the effect of smoking has on union rates in patients who suffer from acute fractures or non-unions of the scaphoid.

Methods: Using PRISMA guidelines, two databases were searched for original articles comparing smoking to non-union rates for the management of scaphoid fractures and non-unions. Data was then analysed to identify relative risk of smoking after treatment. Inclusion criteria involved comparison between smokers and non smokers, extractable data, patients >16 years and clear definitions on what is classed as a non-union.

Results: A total of 3252 results were narrowed down to 18 studies. Four studies, involving 30320 patients, had acute fractures, and fourteen studies reviewed 1194 patients with non-unions. Of the acute fracture patients, 97.4% of non-smokers achieved union compared with 95.6% of smokers. Pooling the data led to a relative risk for non-union of 1.68 (1.46-1.93). Of the non-union patients, 79.0% of patients who did not smoke achieved union after treatment, compared with 57.4% of smokers. Relative risk for smoking for further non-union in this group was 2.03 (1.70-2.43). When subdividing this group into patients who received vascularised and non-vascularised bone graft, the relative risk of non-union from smoking was 3.09 (1.92-4.97) and 5.14 (2.35-11.24) respectively.

Conclusion: This is the first paper of its kind to give specific figures for the harmful effects smoking has on scaphoid management, however it is limited by lack of consistency in treatment, heterogeneity and a lack of data. Given the extent of its impact, smoking cessation pathways should be developed as part of the concurrent management of scaphoid injuries or non-union.

A-0038 A LITERATURE REVIEW ON THE EFFECT OF MIRROR THERAPY IN THE IMPROVEMENT OF HAND FUNCTION AFTER FLEXOR TENDON REPAIRS

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Introduction: Flexor tendon injuries account for a substantial proportion of hand trauma cases, often resulting in pain, stiffness, and impaired function. Hand function is an important aspect for upper extremity function. While traditional rehabilitation emphasizes early mobilization, novel adjunctive strategies such as mirror therapy (MT) remain underexplored in this context. Evidence for MT in neurological conditions is promising, yet its role in tendon rehabilitation remains unclear.

Aim/objective: This review aimed to evaluate the effectiveness of mirror therapy in improving hand function following flexor tendon repair.

Methods: A systematic search was conducted in PubMed using PICO-derived keywords, restricted to randomized controlled trials (RCTs) published within the last ten years. Three eligible studies were identified: two investigating MT in flexor tendon repair and one examining MT in peripheral nerve injuries within the flexor tendon zone. Data extracted included study design, sample characteristics, intervention protocols, and outcome measures such as range of motion, grip strength, dexterity, pain, and patient-reported function.

Results: Across the studies (n≈70 participants), MT was consistently associated with improvements in functional outcomes compared to control groups. Significant gains were reported in range of motion, grip strength, pain reduction, and disability indices ($p<0.05$) in MT groups following tendon repair. However, the sample sizes were small, follow-up was short, and methodological limitations were evident, particularly lack of blinding and absence of long-term data.

Discussion/Conclusions: This review highlights MT as a promising adjunct to conventional rehabilitation after flexor tendon repair, with consistent short-term improvements in motor and functional outcomes. Nevertheless, evidence remains limited, and definitive conclusions cannot yet be drawn. High-quality, large-scale RCTs with extended follow-up are required to establish the efficacy and durability of MT in this setting.

Impact: For clinical practice, MT offers a low-cost, easily implementable adjunct to standard rehabilitation, potentially enhancing functional recovery. Locally, its integration could optimize patient outcomes and reduce complications. At a broader level, these findings may inform the development of future national rehabilitation guidelines for tendon repair.

Key words: Flexor tendon repair, Mirror therapy, Hand function, Rehabilitation, Motor Recovery

A-0040 PERFUSION IN DIGITAL REPLANTATION – DOES THE NUMBER OF VASCULAR ANASTOMOSES INFLUENCE THE OUTCOME?

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Background: The optimal number and configuration of vascular anastomoses in digital replantation remain controversial. While arterial inflow is essential for digit survival, the impact of reconstructing both arteries and the number of venous outflows on clinical outcomes is still a matter of debate.

Methods: In this retrospective, single-center case-control study, all digital replantation procedures performed at the University Hospital of Bern between 2019 and 2023 were reviewed. Of 44 patients, 36 had complete data sets, allowing analysis of 57 replanted digits. The number of arterial and venous anastomoses was recorded and their relationship to digit survival evaluated. In addition, the artery-to-vein ratio was analyzed as a potential predictor of outcome.

Results: The reconstruction of one versus both digital arteries had no significant influence on the survival rate of replanted digits. Successfully replanted fingers had a higher mean number of venous anastomoses. Despite this trend, the ratio of arterial to venous anastomoses was not a statistically significant predictor of replantation success. In respect to the amputation level, the result stayed the same.

Conclusion: While the number of venous anastomoses appears to correlate with improved digit survival, the presence of one versus two arterial repairs does not significantly impact outcomes. Nor is the artery-to-vein ratio alone a reliable predictor of surgical success.

A-0041 ECHECS ET COMPLICATIONS DES PROTHÈSES TRAPÉZO-MÉTACARPIENNES

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Les prothèses trapézo-métacarpiennes sont une des indications modernes du traitement chirurgical de la rhizarthrose. Leurs résultats se sont considérablement améliorés au cours des vingt dernières années, et leurs indications se sont donc élargies chez des patients plus jeunes et actifs. Il est important d'analyser les causes d'échecs de ces nouveaux modèles

de prothèses, qui sont essentiellement d'ordre technique, et de cerner leurs complications, afin de pouvoir les prévenir au maximum et de les traiter au mieux.

Les échecs peuvent être liés à une mauvaise indication mais sont essentiellement d'ordre technique. Une analyse précise des sources d'échec est présentée.

Les complications sont de 3 nature: les luxations, précoces et sous la responsabilité du chirurgien, et tardives en rapport avec une défaillance du matériel. Les descellements apparaissent surtout autour des cupules. Ils doivent être détectés afin de permettre une reprise chirurgicale préservant le capital osseux du trapèze.

Enfin les inserts en polyéthylène peuvent subir de l'usure, des déformations, voire des fractures et être à l'origine de luxations intra-prothétiques.

D'autres complications sont plus rares, fractures du trapèze, ténosynovite de De Quervain notamment.

A-0042 TREATING MUSICIANS AS ATHLETES

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Musicians push their bodies to the same limits as athletes — yet their injuries are often misunderstood, misdiagnosed, or dismissed as “overuse.” Musicians, like athletes, rely on precise physical coordination, endurance, and repetition—yet they are often underserved by traditional rehabilitation models. This one-hour instructional course introduces healthcare providers to the foundational principles of treating musicians through an athletic lens.

In this course we will touch on assessment and treatment techniques to optimize the movement of musicians with the same biomechanical precision and performance mindset used in sports medicine.

Through real-world case studies and evidence-based techniques, you'll explore:

- The biomechanical demands of instrument performance — from posture and ergonomics to joint mobility and endurance.
- Neuromuscular anatomy, assessment and treatment strategies for nerve compressions and complex conditions such as tremors and focal dystonia.
- Myofascial manipulation with nerve glide mobilization to restore neural function for optimized coordination, control, and flow.
- Athletic-style rehab programming for musicians — integrating proprioceptive training and taping to movement retraining for peak performance.

While incorporate stress management, nutrition, and adaptations into care plans

This course bridges the gap between rehab and performance, empowering therapists to treat musicians not just as patients — but as elite movement performers.

A-0043 EARLY VS. LATE EDS DIAGNOSIS: HOW IT SHAPES YOUR MANAGEMENT JOURNEY

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Ehlers Danlos Syndrome (EDS) aka double jointed is a missed opportunity for the therapists to intervene to make lifelong changes and improve the quality of life of these people.

Learn how the symptoms EDS and hEDS change from an early to late presentation.

Few present early with symptoms however, early education and prevention is the key in the management of the hereditary disorder for improved quality of life.

Genetic factors play a role in the diagnosis, but not all codes have been identified. Thus, there are many who get lost through the cracks. However, what comes next shapes their journey. Hand and Upper extremity Therapists can be crucial in educating this population about the diagnosis and on the progression of the disease, teaching adaptation, functional splints/ taping and exercises to live with their condition. If not managed these patients may require surgery, however, many fail due to lack of assessment of the underlying cause and application of incorrect treatment. Thus, therapists can be influential in filling the cracks by educating patients on the disease process and surgeries thus making lasting changes and improving their quality of life.

So, learn how to identify the root cause of insidious hand pain in individuals with hypermobility and provide effective pain relief without stretching the ligaments. Explore comprehensive management strategies, from using functional splints to incorporating proprioception, postural exercises and managing nerve symptoms from neck to fingertips. Gain practical knowledge with case studies on taping techniques, effective splinting, and how to address the unique challenges of this population. Understand the PENTAD and its impact on therapy and make a compelling economic case for early diagnosis and targeted treatment of EDS to improve long-term outcomes and reduce healthcare costs.

This engaging lecture will be packed with dynamic case studies and video demonstrations, showcasing a variety of real-world scenarios in the management of this patient population. The course is designed with a multidisciplinary approach at its core, emphasizing the collaborative efforts needed for effective care. It begins with primary care professionals, who play a pivotal role in early diagnosis, followed by therapists who empower patients by educating them on symptom management. As symptoms evolve, ongoing management strategies are key to improving patient well-being. Surgeons also play an integral role, performing precise surgeries that significantly enhance the quality of life for these individuals. Together, this holistic approach ensures a comprehensive treatment journey, ultimately making a profound impact on patient outcomes.

A-0044 TREATMENT TECHNIQUE USING SEMI-OCCLUSIVE FOIL DRESSING IN TRAUMATIC AMPUTATIONS OF THE DISTAL PHALANX

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Introduction: Traumatic fingertip amputations account for approximately 2–4% of hand injuries. They have a significant impact on finger function and carry a potential risk of complications. The therapeutic approach is multifactorial, depending on the location and severity of the trauma.

Methods: A clinical and functional assessment was conducted to describe the short- and mid-term outcomes achieved in the treatment of traumatic distal phalanx amputations using a semi-occlusive foil dressing.

Aim: To compare the results of treatment with a semi-occlusive foil dressing in traumatic amputations in adults with those obtained through other therapeutic approaches, and to clearly define the selection criteria for patients suitable for this type of treatment.

Conclusion: The treatment of fingertip amputations with a semi-occlusive foil dressing offers several advantages and represents an effective therapeutic method with a low complication rate, provided that appropriate patient selection is made.

A-0046 THE BENEFITS OF FRAGMENT SPECIFIC FIXATION IN SURGICAL TREATMENT OF DISTAL RADIUS FRACTURES

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We examined the benefits of the concept of fragment specific fixation (FSF) in surgery for distal radius fractures (DRF). For DRF, we defined the important sites that should be fixed in each fracture type as key parts (KP). While it is generally preferable to complete the procedure with a single volar locking plate, in fracture types with multiple KPs, we did not force completion with only one plate but performed various additional fixations as needed based on the FSF concept in 50 cases. In all cases, there was almost no loss of correction until bone healing, and the modified Mayo wrist score showed Good or better results. In DRF surgery with multiple KPs, introducing fixation methods based on the FSF concept appears to lead to improved outcomes.

A-0047 FROM PASSIVE TO PARTICIPATIVE: MULTIPLE TENDON TRANSFERS UNDER WALANT

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Wide Awake Local Anesthesia No Tourniquet (WALANT) has gained widespread acceptance in hand surgery, offering clear advantages in tendon repair surgeries or single tendon transfers. However, its application in multiple tendon transfers for nerve palsies remains underreported, largely due to concerns regarding anesthetic volume, safety, and intraoperative patient cooperation.

This retrospective case series evaluates the clinical and functional outcomes of 14 patients (4 radial, 7 posterior interosseous, 2 ulnar, and 1 median nerve palsy) who underwent multiple tendon transfers under WALANT between March 2015 and March 2025. All procedures were performed under WALANT, without tourniquet or sedation. The mean volume of local anesthetic administered was 68.9 mL (range, 30–115 mL). The average patient age was 49 years (range, 24–69), and the mean operative duration was 207 minutes (range, 122–265). The mean follow-up period was 37 months (range, 1–106). No patients required secondary revision procedures.

At final review, motor recovery averaged 3.7 (range, 1–5) on MRC scale. All patients tolerated the procedure comfortably and participated actively in intraoperative assessment of tendon excursion, balance, and tensioning. This real-time feedback allowed the surgical team to fine-tune tension and optimize transfer function immediately, potentially reducing the risk of over- or under-tensioning. Importantly, patient engagement during awake surgery transformed the traditional passive approach into a collaborative, participative model—enhancing both surgical precision and patient satisfaction. This study demonstrates broader application of WALANT in multiple tendon transfers, underscoring the evolving paradigm of awake patient-centered complex reconstructive surgeries. Our accompanying video documentation further illustrates methods to engage the awake patient intraoperatively, highlighting strategies to ensure comfort, cooperation, and optimal tensioning outcomes.

A-0048 CURRENT ADOPTION AND BARRIERS FOR PERI-OPERATIVE IMMERSIVE VIRTUAL REALITY IN HAND SURGERY - FINDINGS FROM AN INTERNATIONAL PILOT SURVEY

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Background: Immersive virtual reality has become a promising approach to reduce perioperative anxiety and improve patient experience during procedures performed under local anaesthesia. Initially applied in burn care and its application in hand surgery, however, remains rarely documented.

Objective: Assess global uptake of VR for perioperative patient distraction in hand surgery and identify hand surgeons' perceptions, barriers, and challenges among both users and non-users.

Methods: A descriptive pilot study was conducted using a self-developed online questionnaire distributed worldwide from February to June 2025 via social media and WhatsApp groups. The two-stage survey comprised 17 questions covering usage, perception, barriers, and implementation interest.

Results: The survey collected 230 responses from surgeons in 37 countries. Overall, 80.4% reported not using VR; the most cited reasons were cost (19%), lack of awareness (16%), and institutional resistance (16%). Over 75% of non-users expressed interest in adopting VR in the future. Current users rated usability and patient experience at a mean of 3.7 out of 5. Among users, 57% reported being able to perform procedures profitably while patients were immersed, and a similar proportion described VR as effective but time-consuming. Sixty-eight percent of all respondents supported integrating VR into standard anaesthetic care and recommended a stepwise adoption strategy.

Conclusion: By 2025, immersive VR is infrequently used for patient distraction in hand surgery despite encouraging signals for anxiety reduction and improved experience. Wider adoption will require stronger evidence on cost-effectiveness and transferability across settings, together with institutional openness and practical solutions for implementation.

A-0049 CLINICAL APPLICATION OF A NOVEL MCPJ BLOCKING SPLINT FOR ADDRESSING MCPJ CONTRACTURES - PRELIMINARY OUTCOMES

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Introduction: Metacarpophalangeal joint flexion (MCPJ) stiffness leads to functional impairment and discomfort. Existing static or dynamic splinting solutions are often complex, reduce comfort, and primarily benefit adjacent flexible joints, while failing to adequately address stiff MCPJs. We developed a novel dorsal hand-based splint that reproduces static progressive traction according to biomechanical principles of tension-targeted distribution. The splint is adjustable and can function as either a serial static or static progressive splint, depending on patient needs, such as improving interphalangeal (IPJ) flexion. Following the published introduction of the splint we present the early functional outcomes of patients using this dorsal MCPJ blocking splint in a clinical setting.

Methods: This observational pre-post study evaluated the early outcomes in patients with MCPJ stiffness treated with the MCPJ dorsal blocking splint. Eligible participants included individuals with primary or secondary MCPJ extension contractures, with flexion limitation greater than 30°, in either the sub-acute or chronic phase of arthrogenic contractures. Patients with neurological conditions, acute myogenic contractures, unhealed fractures or extensor tendon trauma were excluded. Outcome measures included active range of motion (AROM), total active motion percentage (TAM%), Patient-

Rated Wrist Evaluation (PRWE), pain, patient satisfaction, and daily wearing time. Use time was determined on the joint end feel. The type of splint serial static or static progressive was dependent if the IP joints needed to improve AROM too. Follow-up assessments were performed at baseline, when the splint was fabricated, and subsequently every 2-3 weeks with splint remolding and re-evaluation, continuing until individual functional goals were achieved.

Results: Sixteen patients were included. 11 used the protocol of sub-acute and 5 the protocol of chronic contractures. In overall, TAM% improved 42% after 6 weeks. No adverse effects such as skin pressure marks were observed. Adherence was high, with average reported use of 17 minutes/day. Patients were instructed on tension control and gradual increases for tolerability. Patient satisfaction scores indicated high acceptability, and most participants achieved their Patient-Specific Functional Scale (PSFS) goals within 6–8 weeks. Most patients started with Serial static and progressed to Static progressive orthosis.

Conclusions: This dorsal MCPJ blocking splint provides a practical conservative management option for MCPJ extension contractures. By applying a controlled static progressive stretch tailored to each patient's tolerance and joint stiffness, it offers improved ROM, comfort, and compliance, while minimizing adverse effects commonly associated with serial casting or dynamic splinting. Although these early findings are promising, the small sample size and absence of a control group limit generalizability. With appropriate education, regular monitoring, and a structured wearing schedule, this intervention appears feasible and effective for restoring MCPJ mobility and function. Further comparative clinical studies are warranted to establish its effectiveness against alternative splinting methods.

A-0050 ANALYSIS OF DYNAMIC SCAPHOLUNATE INSTABILITY THROUGH STRESS RADIOGRAPHS AND STRESS CT
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Introduction: Diagnosis of dynamic scapholunate instability remains a complex task. Comparative analysis of different stress radiographs and a novel diagnostic technique with unloaded Ct and clenched fist + ulnar deviation + supination stress CT, and subsequent automated reconstruction/segmentation, are presented.

Methods: Two groups (group A asymptomatic volunteers and group B patients with dysfunctional dynamic scapholunate instability) were evaluated for detection of portential increase in scapholunate distance and dorsal scaphoid translation, which may indicate dynamic scapholunate instability. This was done using different stress radiographs and comparing CT scans of the wrist under clenched fist plus ulnar deviation plus supination stress loading with CT scans without loading, after automated segmentation process. Dynamic scapholunate instability was defined by the presence of a Watson positive test, while patients with dysfunctional scapholunate instability experienced also radial-sided pain and dysfunction. Statistical analysis was performed with significance level set on $p < 0,05$.

Results: 22 patients in group A and 21 patients in group B were evaluated. In group A, the scapholunate distance increased not significantly under different anteroposterior stress radiographs compared to an unloaded radiograph. In group B, the scapholunate distance under clenched fist plus ulnar deviation stress plus pronation or supination increased significantly compared to an anteroposterior unloaded radiograph. The dysfunctional side was significantly different from the contralateral side under clenched fist and under clenched fist plus ulnar deviation plus pronation stress. After re-grouping patients with positive scaphoid shift wrists, with and without dysfunction, versus patients with negative scaphoid shift wrists, the scapholunate distance under clenched fist plus ulnar deviation stress plus pronation or supination increased significantly more than under clenched fist alone.

Group A, no significant differences were found between both sides on the unloaded or stress CT. In Group B, no significant differences in radioscapoid distance, scapholunate distance, and radiolunate distance were measured between the symptomatic side and the contralateral side during the unloaded CT. When comparing stress CT versus unloaded CT, only the increase in scapholunate distance was significant. After re-grouping patients with positive scaphoid shift wrists, with and without dysfunction, versus patients with negative scaphoid shift wrists, only the scapholunate distance was significant in the unloaded CT. However, when comparing stress CT versus normal CT, a significant increase in radioscapoid distance and a significant increase in scapholunate distance in positive scaphoid shift wrists was noted.

Conclusion: According to our results, adding ulnar deviation to clenched fist of the wrist is essential to reveal increase in scapholunate distance in the radiological assessment of dynamic scapholunate instability. This clenched fist plus ulnar deviation stress loading of the wrist seems to induce also an increase in scapholunate distance and dorsal scaphoid translational alignment in patients with dynamic scapholunate instability, which can accurately be measured with automated reconstructed CT-scanning with vs without stress loading. This technique enables the precise detection of increase in scapholunate distance and dorsal scaphoid translation, which could provide objective information to guide treatment decision. Repeating it post-treatment and comparing it with preoperative investigation is potentially useful to evaluate restored scapholunate stability or recurrence of this condition.

A-0051 TEN YEARS ON: AN UPDATED SCOPING REVIEW OF RELATIVE MOTION ORTHOSES FOR MANAGING VARIOUS HAND CONDITIONS

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Study Design: Scoping Review

Introduction: In the 10 years since the landmark Relative Motion (RM) scoping review was published, literature has tripled and clinical applications across three categories (protective, exercise, adaptive) has expanded. Hence, there is a need to understand if this translates to improved patient outcomes.

Purpose: To provide an overview of published evidence since 2016 pertaining to RM orthotic use for hand conditions and to integrate these findings with the 2016 review.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) guided this study. Four electronic databases were searched: CINAHL, Embase, Medline and PubMed. Studies investigating RM use in adults with hand injuries/conditions were included. Data extracted included key demographic, intervention and outcome details. Quantitative and qualitative data was appraised using the Structured Effectiveness Quality Evaluation Scale (SEQES) and Standards for Reporting Qualitative Research (SRQR). The Template for Intervention Description and Replication (TIDIER) checklist evaluated intervention reporting, from which a narrative synthesis of the data was completed.

Results: After vetting, twenty-two peer-reviewed studies were identified encompassing a total of 386 RM participants. Quantitative studies were categorised: protection (n=19 studies, 346 participants) and exercise (n=1, 20 participants). Qualitative data: adaptive (n=1, 4 participants) and both protective and exercise (n=2, 16 participants). Study designs included- randomised control trials (n=6), retrospective case series (n=6), prospective case series (n=1), clinical audit (n=1), case reports (n=4), qualitative (n=2) and mixed-methods (n=1). Equal or better outcomes were reported in three studies comparing RME to alternative approaches for managing zones V-VI extensor tendons repairs.

Conclusion: The RME-only approach is supported as safe for extensor zones V-VI by multiple RCTs. Since 2016, RM literature

has broadened to include more hand conditions. Further studies are needed to support its clinical use in flexor tendon management, boutonniere deformity, and other presentations.

A-0052 MICROSURGICAL ANATOMY OF THE ARTICULAR NERVES OF THE WRIST: UNCOVERING NEW PATHWAYS FOR TARGETED DENERVATION

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Background: Wrist denervation is an established surgical approach for chronic wrist pain, aimed at selectively interrupting nociceptive input while preserving joint function. The anatomical basis was first laid by German plastic surgeon Albrecht Wilhelm, who in 1958 described the articular innervation of the upper extremity and introduced the first surgical wrist denervation in 1966. Although multiple modifications to his technique have been proposed, long-term outcomes remain variable, with reported sustained pain relief in only 50–70% of patients. This highlights the need for improved anatomical understanding and targeting. Remarkably, no high-resolution anatomical studies have been performed since Wilhelm's time. We therefore conducted a detailed anatomical reevaluation of wrist innervation under microscope magnification to support improved surgical precision and outcomes.

Methods: Three formalin-fixed human cadaver arms (forearm to hand) were provided by the Institute for Functional and Applied Anatomy at Hannover Medical School. Microsurgical dissection was performed in a proximal-to-distal fashion. The superficial radial, posterior and anterior interosseous, palmar cutaneous branch of the median, thenar, lateral and medial antebrachial cutaneous, posterior cutaneous, and deep and superficial branches of the ulnar nerve were carefully dissected, including their articular and communicating branches. All articular branches were documented on custom skeletal templates in radial, ulnar, dorsal, and volar views. In one specimen, selected branches were excised and processed for histological (H&E) and immunohistochemical (Substance P) staining to confirm neural and nociceptive structures.

Results: Numerous previously undescribed articular branches to the wrist, intercarpal, and carpometacarpal joints were identified. Notably, a previously unreported independent articular branch of the ulnar nerve was found at the proximal wrist, running distally alongside the ulnar artery and giving rise to multiple fine branches to the ulnar-sided joints. Histological analysis confirmed neural tissue; Substance P staining identified nociceptive fibers in several of these branches.

Discussion: Our findings reveal a more complex innervation pattern of the wrist than previously described. The identification of novel articular branches, including a distinct ulnar-derived nerve, may help explain variability in clinical outcomes and guide more targeted procedures. This updated anatomical framework supports more effective and selective wrist denervation techniques.

A-0054 CLINICAL ADOPTION OF IMMERSIVE VIRTUAL REALITY FOR HAND THERAPY: AN INTERNATIONAL SURVEY

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Introduction and Aim: Immersive virtual reality is an evolving tool in hand therapy with potential benefits across multiple diagnoses and injury types. This study aimed to map current use, perceived barriers, and future adoption intentions for VR among hand therapy clinicians worldwide.

Material and Methods: A self-developed, online survey (8 questions) was circulated via social media and email through five international hand therapy societies. Respondents reported which indications they use VR for, barriers for not yet adopting VR, and whether they plan to implement VR in their practice.

Results: A total of 236 clinicians from 30 countries completed the survey. Ninety-one percent reported they do not currently use immersive VR in clinical practice. The most frequently reported barriers were high initial costs for hardware and software (29.74%) and lack of awareness about VR's practical applications in hand therapy (16.39%). Among non-users, 10.70% expressed a clear intent to start using VR, 56.69% indicated they might start, and 32.58% stated they will not adopt VR.

Conclusion: Although current clinical use of immersive VR in hand therapy remains limited, there is notable interest among clinicians to integrate the technology. Wider uptake will likely require lower costs, better usability, and a broader evidence base demonstrating therapeutic benefits. Additional research is necessary to confirm clinical effectiveness and guide implementation strategies.

A-0055 ARTHROSCOPIC-ASSISTED MCP JOINT FRACTURE MANAGEMENT. EMPHASIS ON FUNCTIONAL RESTORATION

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Background: Intra-articular fractures of the metacarpophalangeal (MCP) joint represent complex injuries requiring precise management to restore hand function. The MCP joint serves as a critical articulation for grip strength, fine motor control, and activities of daily living. Traditional open reduction techniques, while achieving fracture stability, may compromise periarticular soft tissues and lead to stiffness, adhesion formation, and functional limitations.

Arthroscopic-assisted management has emerged as a minimally invasive approach that prioritizes both anatomic restoration and functional recovery through reduced surgical trauma and accelerated rehabilitation.
Objective: This review examines arthroscopic-assisted techniques for MCP joint intra-articular fractures with particular emphasis on postoperative functional outcomes, including range of motion, grip strength, dexterity, and return to daily activities.

Results: Clinical studies demonstrate superior functional outcomes with arthroscopic-assisted techniques compared to traditional open approaches. Key functional advantages include:
Range of Motion: Patients achieve earlier return of active and passive motion, with mean MCP flexion-extension arcs of 75–85 degrees at 3 months and 85–95 degrees at 6 months postoperatively. The minimally invasive approach reduces extensor adhesions and preserves gliding surfaces, allowing smoother tendon excursion.
Grip Strength Recovery: Functional grip strength recovery reaches 70–80% of the contralateral hand by 3 months and 85–95% by 6 months. The preservation of intrinsic muscle attachments and early mobilization protocols contribute to accelerated strength restoration.
Fine Motor Function: Pinch strength (key, tip, and tripod) demonstrates parallel recovery patterns, with patients regaining 80–90% of baseline function within 4–6 months. The precision of arthroscopic reduction maintains joint biomechanics essential for coordinated finger movements.
Functional Scores: Patient-reported outcome measures, including the Quick DASH (Disabilities of the Arm, Shoulder and Hand) and VAS score, show significant improvements. Patients typically achieve scores indicating minimal disability by 6 months, with continued improvement through 12 months.
Return to Activities: Most patients resume light activities of daily living within 4–6 weeks and return to full unrestricted activities, including work and sports, by 3–4 months.
Rehabilitation Protocols: Early protected motion protocols, typically initiated within 3–5 days postoperatively, capitalize on the minimally invasive approach. Progressive resistance exercises, edema control, and scar management programs optimize functional recovery while preventing stiffness.

Conclusions: Arthroscopic-assisted management of MCP joint intra-articular fractures offers significant functional advantages over traditional open techniques by balancing anatomic precision with soft tissue preservation. The approach facilitates earlier rehabilitation, accelerates functional recovery, and improves patient satisfaction. Successful outcomes depend on achieving the "functional triad": anatomic articular reduction, stable fixation allowing early motion, and preservation of periarticular soft tissue integrity. This technique is particularly valuable in active individuals, manual laborers, and athletes where rapid functional restoration is paramount. Proper patient selection, arthroscopic expertise, and adherence to structured rehabilitation protocols are essential for optimizing functional balance and long-term hand performance.

Keywords: Arthroscopy, metacarpophalangeal joint, intra-articular fracture, functional outcomes, range of motion, grip strength, hand rehabilitation, minimally invasive surgery

A-0056 RUPTURE TENDON

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Comminuted fractures of the distal phalanx base associated with flexor digitorum profundus (FDP) tendon avulsion present a significant surgical challenge due to the anatomical complexity and critical role of this structure in grip strength and fine motor function. Although these injuries are less prevalent compared to other hand traumas, they severely affect functionality, especially in young, active individuals. We report the case of a 19-year-old male who sustained a comminuted fracture of the distal phalanx base of the left fourth finger, associated with bony avulsion by the FDP tendon, following a ground-level fall (Leddy Packer Vb). The patient underwent fragment fixation with Kirschner wires and tendon reinsertion using a pull-out technique, followed by early rehabilitation, showing favorable clinical and functional outcomes.

A-0057 RESTORING CARPAL BALANCE AFTER DISTAL RADIUS FRACTURE: EARLY RECOGNITION AND TREATMENT OF PROXIMAL ROW COLLAPSE

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Post-traumatic carpal instability nondissociative (CIND) is rare and easily overlooked, especially after distal radius fractures. Early recognition is crucial, as untreated malalignment can lead to chronic dysfunction requiring salvage procedures such as radiocarpal fusion.

We describe the case of a 41-year-old man who sustained a dorsally comminuted intra-articular distal radius fracture. Initial radiographs and CT scan showed intra-articular involvement without carpal malalignment. Initially treated by closed reduction and casting, 18 days later, lateral radiographs revealed flexion of the proximal row, consistent with early palmar CIND (Figure 1). Because of the fracture and carpal alignment changes, prompt surgical treatment was indicated. Through a dorsal approach, the fracture was reduced anatomically and fixed with a dorsal-ulnar plate. The dorsal radiocarpal (DRCL) and dorsal intercarpal (DIC) ligaments appeared macroscopically intact, but fluoroscopy demonstrated persistent flexion of the proximal row despite reduction. To restore alignment, the dorsal capsule was reefed and the DRCL sutured to the plate to restore tension. These maneuvers corrected the malalignment, confirmed visually and by dynamic fluoroscopy (Figure 2).

Postoperative radiographs confirmed union and stable alignment, maintained at one-year follow-up. At five months, the patient had 50°/70° wrist flexion-extension (60°/70° contralaterally), full grip strength (45 kg) and no pain. At one year, he remained asymptomatic with full return to work and maintained carpal alignment (Figure 2).

Palmar CIND associated with distal radius fractures has scarcely been reported (Fernández, 2015; Li et al., 2023). Terminology across the literature is inconsistent; most reported cases involve radiocarpal dislocations or chronic malunions leading to adaptive CIND. They generally describe irreducible deformities treated with delayed procedures such as salvage surgery or volar capsular release—none addressing the problem in the acute setting. In contrast, this patient was diagnosed early, when the deformity was still reducible, allowing restoration of stability by reinforcing the dorsal soft tissues.

This scenario parallels the staging concept proposed by García-Elias for scapholunate instability, where early reducible stages are amenable to repair, whereas fixed deformities require salvage. Following the same principle, dynamic fluoroscopy confirmed reducible malalignment, leading to dorsal capsuloligamentous reinforcement to achieve durable correction and prevent progression to chronic instability.

Studies have demonstrated the importance of the DRCL and DIC ligaments in maintaining carpal alignment and resisting palmar translation of the proximal row (Wolfe et al., 2012; Bui et al., 2021). Even without rupture, attenuation or laxity during trauma may contribute to flexion of the proximal row. This fits with the “mooring lines” concept (Li et al., 2023), where loss of dorsal restraint allows volar rotation and volar capsular tension perpetuates the deformity. Reinforcing the dorsal structures restores balanced kinematics and unloads volar ligaments, limiting further collapse.

This case underscores that early palmar CIND following distal radius fracture may be subtle but clinically significant. High suspicion, careful follow-up and intraoperative assessment are essential. When malalignment persists despite anatomical fixation, dorsal capsuloligamentous reinforcement may be required to restore stability and preserve function. Greater awareness of this injury pattern may enable timely intervention and reduce the risk of debilitating salvage procedures.

A-0058 RADIOGRAPHIC EVALUATION OF STABILITY IN ACUTE SCAPHOID FRACTURES TREATED WITH VOLAR BUTTRESS PLATE

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Introduction: Scaphoid fractures are commonly encountered by hand surgeons, with several implant options available for their treatment. Plate osteosynthesis has recently gained popularity as a useful tool for nonunion and pseudoarthrosis treatment of the scaphoid. However, literature regarding plate fixation in the acute setting remains scarce. This study is a retrospective observational radiographic cohort study of ten patients suffering from acute scaphoid fractures and treated with plate fixation.

Materials and methods: Inclusion criteria included patients over 18 years of age, with a primary scaphoid fracture under 4 weeks of initial trauma until the moment of surgery. We excluded from our study patients with prior procedures, fractures older than 4 weeks, scaphoid non-union or pseudoarthrosis and patients with incomplete radiographic follow-up.

Radiographic measurements used were lateral AP radiographs for scapholunate angle measurement and the scaphoid-to-plate ratio. CT scanning was used to measure intrascaphoid angles on sagittal cuts as described by Nagura (2021).

The scaphoid-to-plate ratio was determined by dividing the length of the scaphoid (in millimeters, in the lateral radiographic view) by the known length of the scaphoid plate.

Results: Our cohort included 10 patients. Mean age for the patients was 24.2 years (SD $\pm$ 7.93), with 9 male and 1 female patient. Average preoperative scapholunate angle was measured at 54.7° and average intrascaphoid angle was measured

at 30.8°. The most common fracture pattern was a transverse fracture crossing the waist of the scaphoid, or B2 according to the Herbert classification.

Shapiro-Wilk test was used to assess the normality of the data, yielding a p-value of 0.346, indicating normal distribution. The mean preoperative and postoperative scaphoid-plate ratio was 1.45 (SD $\pm$ 0.07), and 1.43 (SD $\pm$ 0.075) respectively. The Paired Samples t-test was used to assess the postoperative displacement between the two measurements. The p-value obtained when comparing both values resulted in p=0.64, indicating that changes between measurements were not statistically significant.

Average time to fracture consolidation was 12.4 weeks, with one patient exhibiting clear signs of trabecular bone partially bridging the fracture as early as 5.5 weeks. The mean length of the screw used was 10.7, with 80% of the fractures fixed with the maximum of 6 screws allowed by the plate.

Discussion: Our analysis showed a 100% consolidation rate among the patients treated with plate osteosynthesis. Also, our investigation concluded that postoperative displacement of the fracture fragments is not statistically significant. Additionally, all patients presented a small increase in postoperative scaphoid-plate ratio. We attribute this change to minor trabecular collapse in the fixed scaphoid.

Conclusion: Plate osteosynthesis is a valid option for the acute management of scaphoid fractures, achieving a high union rate. It represents a robust implant suitable for both acute fractures and nonunion revision surgery, although it may require implant removal in some cases.

A-0059 RECONSTRUCTION OF UPPER EXTREMITY BONE DEFECT USING VASCULARIZED FIBULAR GRAFT: A CASE SERIES STUDY

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Aims: We report a series of patients treated with vascularized fibular graft after upper extremity bone defects. The purpose of this study was to evaluate the mid- and long-term survival of the bone reconstructions with free vascularized fibular graft, characterizing patterns of success and failure.

Methods: A total of 7 patients were included in this retrospective study. Median age was 52 years (range 22- 80). Of the 7 patients, 2 were women (28.5%) and 5 were men (71.4%) . The bone defect was located in the radial diaphysis in 3 patients (42.8%), humeral diaphysis in 3 patients (42.8%) and ulnar diaphysis in one patient (14.28%). They were all treated with bone reconstruction with vascularized fibular graft

Results: Median follow-up was 18.8 weeks (8-29). Median consolidation time was 6.8 months (3 -12). Complications occurred in 5 patients (71 %), these included necrosis of the fasciocutaneous island graft (1 case), loosening of the osteosynthesis material and non union (1 case), peri-implant fracture (1 case), radial nerve palsy (1 case), sepsis and amputation (1 case).

Conclusion: Vascularized fibular graft for reconstruction of upper extremity bone defect is a reliable solution with long-term success and good functional outcomes, due to the predictable vascular pedicle, long cylindrical shape, and tendency to hypertrophy, and resistance to infection. However, the patients may require further surgeries to treat major complications.

A-0060 VASCULARIZED HYPOTHENAR FLAP IN REVISION CARPAL TUNNEL SURGERY: TECHNIQUE DESCRIPTION AND CASE SERIES REPORT

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Introduction: Recurrent carpal tunnel syndrome (CTS) represents a surgical challenge due to its association with scar fibrosis and loss of the median nerve gliding bed. The vascularized hypothenar flap has been proposed as an alternative to improve outcomes in revision surgery.

Objective: To describe the surgical technique of the vascularized hypothenar flap and present the functional outcomes of a case series treated at Centro Médico ABC.

Material and Methods: This is a retrospective descriptive case series including patients with persistent or recurrent CTS following a previous release. All patients underwent revision surgery that included neurolysis and coverage with a vascularized hypothenar flap. Demographic variables, type of previous release, and postoperative clinical evolution (VAS pain score, sensory recovery, and functional scales) were recorded.

Results: Four patients (five hands) were operated on, with ages ranging from 52 to 88 years, including two men and two women. Two cases had a previous open release, and three had an endoscopic release. All presented extensive intraoperative fibrosis. Neurolysis, epineurolysis, and coverage with a reverse-flow vascularized hypothenar flap were performed. Patients showed clinical improvement and progressive functional recovery during follow-up. No recurrences of CTS were observed after the procedure.

A-0061 TRIBUTE TO J. WILLIAM LITTLER'S DRAWINGS OF THE NEUROVASCULAR HETERODIGITAL ISLAND FLAP AND OUR OWN CLINICAL EXPERIENCE IN 12 CASES

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Introduction: J. William Littler was not only an extremely competent hand surgeon, he was also a fantastic illustrator of hand surgery. Many of his drawings were published by Steven Z. Glickel, MD, in *The Littler Legacy*. However, one of his most brilliant drawings is missing from the collection: that of the neurovascular island flap, named after Littler.

The neurovascular island flap, with harvesting of the skin island from the middle phalanx of the middle finger, is a universally applicable flap in reconstructive hand surgery, which continues to be particularly useful for the thumb reconstruction.

Materials and Methods: We compiled drawings of the neurovascular island flap from various textbooks and the internet and compared them with Littler's drawings. We have also compiled 12 cases in which the Littler flap has been used in the clinic, primarily for palmar thumb reconstruction.

Results and Summary

Littler's own drawing of the neurovascular island flap is unsurpassed in its quality. No other drawing achieves this artistic quality. No flap complications were observed in any of the 12 clinical cases. However, nerve regeneration fell significantly short of expectations. The Littler flap remains, after free toe pulp flaps, the first choice for palmar distal phalanx defects of the thumb.

A-0062 COMPUTER-ASSISTED 3-DIMENSIONAL-PLANNED CORRECTIVE OSTEOTOMY FOR SYMPTOMATIC MALUNION OF THE ULNA IN AN ADOLESCENT: A CASE STUDY

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We present a case of a symptomatic ulnar malunion managed with computer-assisted 3-dimensional planned corrective osteotomy in a 14-year old patient with a history of a mid-diaphyseal ulna fracture treated conservatively. Preoperatively, the patient presented with pain at the malunion site and lack of pronation of the involved forearm. The ulnar diaphyseal deformity was complex and existed in multiple planes. Preoperative bilateral computed tomography scans of the forearm were used to plan 3-dimensional guides for the osteotomy, which were subsequently printed and used during surgery. Postoperatively, the patient demonstrated pain-free, full range of motion of the forearm and returned to contact sports 4 months after surgery. Computer-assisted 3-dimensional planned osteotomy could be a reliable and precise option for complex ulnar diaphyseal malunion corrective surgery.

A-0063 PRELIMINARY EFFECTIVENESS AND PRODUCTION TIME AND COSTS OF THREE-DIMENSIONAL PRINTED ORTHOSES IN CHRONIC HAND CONDITIONS: AN INTERVENTIONAL FEASIBILITY STUDY

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Background: In chronic hand conditions, orthoses play an important role in reducing impairments and improving the performance of activities of daily living (ADL). Over the past decade, three-dimensional (3D) printing has emerged as a promising alternative to conventional custom-fabricated orthoses for manufacturing hand orthoses. However, despite its growing use, evidence on the effectiveness, production time and costs of 3D-printed orthoses for permanent use in chronic hand conditions remains limited and warrants further investigation.

Aim: To assess the preliminary effectiveness of 3D-printed orthoses compared to conventionally custom-fabricated orthoses for permanent use in persons with chronic hand conditions on ADL performance, quality of life, satisfaction, and production time and costs.

Method: In this interventional feasibility study, individuals with chronic hand conditions received a 3D-printed orthosis of the same type as their previously worn conventional thumb, wrist or wrist-thumb orthosis. Outcomes were assessed at four time points: 2 weeks before the intervention and at baseline for the conventional orthosis, and at 1 month and 4 months follow-up for the 3D-printed orthosis. The primary outcome, ADL performance at 4 months follow-up, was assessed using the Dutch Flemish Patient-Reported Outcomes Measurement Information System – Upper Extremity custom short form and Michigan Hand Questionnaire Dutch language version. Secondary outcomes included orthosis satisfaction (Dutch Quebec User Evaluation of Satisfaction with Assistive Technology; Dutch Client Satisfaction with Device (D-CSD) questionnaire) and quality of life (EuroQol 5-Dimension 5-Level). Additionally, production time (labor time) and costs were assessed. ADL performance, orthosis satisfaction and quality of life data were analyzed with linear mixed models and differences in production time and costs were analyzed with Wilcoxon signed-rank tests.

Results: A total of 21 participants were included in the study of whom 19 completed the 4-months follow-up assessment. At 4-months follow-up, no significant differences were found between the 3D-printed orthoses and conventional orthoses in ADL performance and quality of life. However, satisfaction with the 3D-printed orthoses was significantly higher than with the conventional orthoses, as reflected by the D-CSD scores (mean difference (SD): +5.11 (2.29), 95%CI: 0.62-9.59). This finding was further supported by the high percentage (79%) of participants who preferred the 3D-printed orthoses. Furthermore, the production time and costs of the 3D-printed orthoses were significantly lower (production time: median 129 min, IQR: 109-148 min, costs: median €187, IQR: €143-206) compared to the conventional orthoses (production time: median 269 min, IQR: 241-311 min; costs: median €398, IQR: €380-436).

Conclusion: This was the first study to compare 3D-printed orthoses with conventionally custom-fabricated orthoses for permanent use in people with chronic hand conditions. The results showed that ADL performance and quality of life were similar for both types of orthoses. However, satisfaction with the 3D-printed hand orthoses was higher and production time and costs for the 3D-printed orthoses were more than halved compared to conventional orthoses. These results highlight the potential of 3D-printed orthoses as a cost-effective and user-preferred alternative to conventional orthoses. Further investigation through a randomized cost-effectiveness study is warranted to confirm these results.

Keywords: Feasibility study; Hand; Orthotic Devices; Patient-Reported Outcome Measures; printing, three-dimensional

A-0064 THE EFFECTIVENESS OF NMES-INTEGRATED THERAPY IN SCAPHOLUNATE LIGAMENT INJURIES – A RANDOMIZED CONTROLLED TRIAL

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Background and Purpose: Recent investigations into carpal biomechanical and ligamentous properties associated with dynamic scapholunate (SL) instability have contributed to the development of conservative treatment approaches. The aim of this study was to investigate the impact of isolated neuromuscular electrical stimulation (NMES) training of the forearm muscles combined with structured exercise training on weight bearing, muscle strength, proprioceptive sensation and upper limb functionality in individuals diagnosed with SL instability.

Methods: This randomized, single-blind, controlled study included 30 patients (26 females / 4 males) aged between 18 and 50 years, who had been diagnosed with SL instability. The patients were randomly assigned to one of two groups: the Exercise Group (EG), who received an exercise program alone, and the Neuromuscular Electrical Stimulation Group (NMESG), who received NMES in addition to the same exercise program. The NMES protocol was applied three days a week for eight weeks, with 15 minutes each for the abductor pollicis longus, flexor carpi radialis, extensor carpi radialis longus, and extensor carpi radialis brevis muscles, for a total of 60 minutes. Each patient also exercised daily at home throughout the eight-week period. Exercise training was prescribed seven days per week. On clinic days, one supervised session was completed in the clinic, followed by two additional unsupervised home-based sessions later the same day. On non-clinic days, patients performed three unsupervised home sessions each day. The primary outcome measure was upper extremity disability, assessed using the QuickDASH questionnaire. The secondary outcome measures included

activity-related pain (assessed using the Visual Analog Scale during activity (VAS-a)), wrist range of motion (ROM), the weight-bearing tolerance test (WBT), isokinetic muscle performance, grip strength, and proprioceptive sense. Pain was evaluated five times in total: at baseline and every two weeks thereafter. All the other assessments were performed twice: at baseline and at the end of the 8th week.

Results: Significant improvements from before to after the intervention were observed in all parameters in both groups ($p < 0.001$). Statistically significant improvements were observed in the NMESSG compared to the EG in terms of QuickDASH scores, VAS-a, WBT, and endurance in flexion ($p < 0.005$). Decreases in pain levels during activity were more pronounced in the NMESSG from baseline to the 2nd, 4th, and 8th weeks of follow-up ($p < 0.05$).

Conclusion: The study results demonstrated that the application of NMES to target muscle groups together with stability-enhancing exercise strategies supports functional recovery. These findings are instructive in determining the ideal rehabilitation strategies for NMES applications as a conservative treatment for SL instability.

Trial registration: The study was registered at ClinicalTrials.gov under ClinicalTrials registration number NCT06627296 on 01/10/2024.

Keywords: Scapholunate instability, Rehabilitation, Neuromuscular electrical stimulation, proprioception, Weight-bearing, Isokinetic muscle strength, Function

A-0065 PRE-OPERATIVE PROGRESSIVE DISTRACTION IN OLD TRANSCAPHO-PERI-LUNATE DISLOCATIONS - 30 YEARS OF A PORTUGUESE TECHNIQUE

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Peri-lunate and transcapo-peri-lunate dislocations are sometimes diagnosed late and are then very difficult to reduce, even by a double dorsal and palmar approach, with poor final results and often secondary surgeries - resection of the proximal carpal row and wrist arthrodeses, that do not restore the correct mobile balance of the wrist.

To make that late reduction easier we described, with our colleagues of Madeira Island, a two stage technique:

- in a first surgical step a radio-metacarpal distractor was put in place and progressive distraction 1-2mm per day was begun;
- 7-10 days later an easy operative reduction and k-wire fixation was performed by a single dorsal approach, removing the external fixator.

We published our first 3 cases, one with an Ilizarov apparatus and two using a small home-made Portsmouth type external fixator, in the British and European Journal of Hand Surgery, in 1995, the first publication of that technique to our knowledge (figs.1, 2).

We seldom used that technique later, because those cases are nowadays rare and we avoided operating cases more than 12 weeks old, due to the common belief that by that time articular surfaces of the unreduced carpal bones would be deteriorated and lead to a painful wrist.

Recent bibliography on old perilunar dislocations or fracture-dislocations is rare, mostly from less developed countries, and only authors from India use our technique, not always mentioning the original article. Prof. Bhavuk Garg published in 2012 16 cases in the J Orthop Surg Res, older than our ones (medium 4,5 months) and with a longer period of progressive distraction (medium 2,4 weeks). A double thread screw and bone graft were used in the scaphoid fracture and a scapho-lunate ligamentoplasty in perilunate dislocations. The good results he mentions are probably a proof that the old 12 weeks statement is wrong...

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A-0066 STAGED REVISION FOR TRAPEZIAL CUP LOOSENING AFTER TRAPEZIOMETACARPAL JOINT ARTHROPLASTY: A CASE-BASED TECHNIQUE AND OUTCOME

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Loosening of the trapezial cup after trapeziometacarpal (TMC) joint arthroplasty is an uncommon but clinically relevant complication, particularly in manual workers. Persistent pain and functional limitation can make revision surgery technically demanding, especially in cases with severe trapezial bone loss.

A 57-year-old male manual worker underwent primary TMC arthroplasty with a Touch® prosthesis in August 2024. The first three postoperative months were pain-free and functionally satisfactory. After returning to work, the patient developed increasing pain, swelling, and reduced thumb function. Imaging revealed loosening and migration of the trapezial cup with marked osteolysis of the trapezium. A staged revision was planned. In the first step, the trapezial cup was removed and the os trapezium reconstructed using autologous iliac crest bone graft. The postoperative course was uneventful. A CT scan is scheduled in the coming weeks to evaluate graft incorporation and plan the second stage with cup reimplantation. This two-stage strategy aims to restore bone stock and create a stable foundation for a new cup implantation, minimizing the risk of early re-loosening and improving long-term stability. Staged revision with iliac crest bone grafting represents a reliable treatment option for trapezial cup loosening after TMC arthroplasty, especially in active patients with high mechanical load on the thumb.

A-0067 RECONSTRUCTION OF THE DISTAL INTEROSSEOUS OBLIQUE BUNDLE USING A STRIP OF THE BRACHIORADIALIS TENDON, FOLLOWING THE AITA-MANTOVANI TECHNIQUE, IN MISDIAGNOSED VOLAR DISTAL RADIOULNAR JOINT DISLOCATION – CASE SERIES

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Volar distal radioulnar joint (DRUJ) dislocation is an exceptionally rare condition, with the existing literature primarily comprising a limited number of case reports. Furthermore, misdiagnosis of a volar DRUJ dislocation occurs in up to 50% of cases, attributed to the infrequency of the injury, subtle clinical presentations, and insufficient radiographic evaluation in emergency settings. Treatment options range from closed reduction followed by immobilization in a pronated position for four to six weeks, to open reduction and repair of DRUJ stabilizers in cases of locked irreducible or chronic dislocation, as well as in instances of unstable DRUJ following an attempt at closed reduction. However, established guidelines for the management of this condition remain lacking, primarily due to its rarity.

Aita and Mantovani proposed a distal interosseous oblique bundle (DOB) reconstruction technique, starting from the physiopathological concept that the DOB is a crucial component among the dynamic wrist stabilizers in restraining the DRUJ, enhancing its stability when longitudinal forces are exerted. The brachioradialis tendon can be grafted, while preserving its distal insertion, and tunnelled through radius and ulna distal metaphysis to restore DRUJ stability in cases of significant instability.

We present a case series of three missed volar DRUJ dislocations, in which the ulnar head was positioned outside the sigmoid notch, treated with Aita-Mantovani DOB reconstruction technique.

A-0068 STRUCTURAL BARRIERS TO OUTCOME MEASUREMENT IN HAND SURGERY: A GLOBAL SNAPSHOT

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Background: Despite increasing emphasis on evidence-based care, routine outcome measurement remains inconsistently implemented in everyday hand surgery. Although initiatives such as the ICHOM Hand & Wrist standard set have improved awareness and comparability, systematic data collection in real-world practice is still limited. Understanding why outcome recording has not yet become routine is essential to bridge the gap between conceptual support and practical implementation.

Methods: To explore current practices and perceived barriers, we conducted a brief international survey among hand surgeons. The questionnaire, written in English, was distributed via social media in March 2025 to groups composed exclusively of hand surgeons. It consisted of four multiple-choice questions and required approximately 20 seconds to complete. Participants were asked whether they currently used a patient outcomes register, their main practice setting, interest in implementing one, perceived barriers, and country of practice. Responses were collected electronically and analysed descriptively.

Results: A total of 116 responses were received from more than 40 countries, providing a broad geographical and institutional spectrum. Overall, 44.8% of respondents reported currently using a patient outcomes register, whereas 55.2% did not. Most respondents worked in mixed (public + private) practice (41%), followed by public hospitals (30%) and private practice (26%). Surgeons in private practice were more likely to use outcome registers (60%) than those in public institutions (29%), suggesting that administrative flexibility or commercial motivation may facilitate adoption, while limited autonomy and institutional inertia may hinder it.

Among surgeons not currently using a register, 54% expressed interest in starting one, and only 3% were not interested, indicating broad conceptual acceptance and willingness to adopt such tools if practical barriers were reduced. The most frequent obstacles were lack of time, lack of institutional support, and lack of technical infrastructure, often selected in combination. Very few respondents cited lack of motivation or funding. These findings indicate that the challenge is systemic rather than personal, consistent with previous national studies such as that by Choo et al. (2025), which also identified logistical and institutional barriers as the main limiting factors.

Discussion: Our findings reveal a paradox: outcome measurement is widely recognised as essential yet remains poorly embedded in daily practice. The challenge lies not in willingness but in workflow integration. Establishing standardised, low-burden tools—whether through national registries or simplified digital modules—could transform routine care documentation into meaningful, comparable data. Artificial intelligence could play a key role in this process by automating data extraction and analysis, allowing outcome recording to become an integrated, effortless part of clinical documentation rather than an additional administrative task.

Conclusion: The gap between awareness and implementation in outcome measurement is structural rather than motivational. The challenge for the future is to identify ways of recording only what truly matters, integrating intelligent systems to simplify the process and enable seamless incorporation of outcome measurement into everyday clinical workflow—without adding workload for clinicians or healthcare professionals.

A-0069 CLINICAL OUTCOMES OF ULNAR SHORTENING OSTEOTOMY WITH VERSUS WITHOUT TFCC FOVEAL REPAIR IN IDIOPATHIC ULNAR IMPACTION SYNDROME: STRATIFIED ARTHROSCOPIC ANALYSIS OF THE FOVEAL LESION

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Purpose: This study aimed to evaluate the clinical outcomes of ulnar shortening osteotomy (USO) with or without concurrent triangular fibrocartilage complex (TFCC) foveal repair in idiopathic ulnar impaction syndrome (UIS), with associated TFCC lesion on arthroscopy-based staging system to stratify foveal lesion severity.

Methods: We retrospectively reviewed 127 patients who underwent USO for idiopathic UIS associated with TFCC foveal lesion with a minimum follow-up of two years. Patients were divided into Group U (USO alone) and Group F (USO with concurrent foveal repair). Foveal lesions were arthroscopically classified as Stage 1 (intact with synovitis), Stage 2 (partial tear), or Stage 3 (complete tear). Clinical outcomes were assessed using VAS, DASH, Mayo Wrist Score (MWS), range of motion, and grip strength. Linear mixed models were used to analyze longitudinal clinical outcomes stratified by lesion stage. Secondary TFCC repair cases in Group U were evaluated separately.

Results: Stage 1 lesions were identified only in Group U (n = 31); Stage 2 in 38 patients in Group U and 23 in Group F; Stage 3 in 17 patients in Group U and 18 in Group F. In Stage 2, DASH showed a significant group-by-time interaction favoring Group F (p = 0.039). In Stage 3, DASH (p = 0.003), MWS (p = 0.015), and grip strength (p = 0.023) significantly favored Group F. Eight patients in Group U underwent secondary TFCC repair and showed significant improvement. No major complications occurred.

Conclusions: In patients with idiopathic UIS and arthroscopically confirmed TFCC foveal lesions, concurrent TFCC repair during USO may improve clinical outcomes when partial or complete tears are present.

Level of Evidence: III

A-0070 ADVANCED TRAPEZIOMETACARPAL ARTHRITIS: A COMPARATIVE STUDY OF ARTHRODESIS AND ARTHROPLASTY

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Introduction: Advanced trapeziometacarpal (TM) arthritis is the most frequently operated site of arthritis in the hand. Although many studies have been conducted, no procedure has been clearly shown to be superior, and the available evidence remains limited. Thumb metacarpophalangeal (MCP) hyperextension and zigzag deformity are well-recognized sequelae of advanced TM arthritis and are known to impair thumb function. The purpose of this study was to compare the clinical and radiological outcomes of arthrodesis and arthroplasty with a minimum follow-up of two years, and to perform a subgroup analysis in patients with MCP hyperextension.

Methods: We retrospectively reviewed patients who underwent either arthrodesis with a locking plate or PyroDisk interposition arthroplasty for advanced TM arthritis between 2013 and 2023, with a minimum follow-up of two years.

Patients with neuromuscular disorders or prior fractures were excluded. Demographic data and the presence of passive first MCP hyperextension $>30^\circ$ were recorded. Clinical outcomes included VAS, DASH, and MHQ scores, tip and key pinch strength, and the Kapandji score at the final follow-up. Radiographic outcomes included the 1–2 intermetacarpal angle, the TM angle, and degenerative changes of the first MCP and STT joints. Major complications were defined as infection, neurovascular injury, or implant-related problems necessitating revision surgery, such as dislocation after arthroplasty and nonunion after arthrodesis. In statistical analysis, because age and preoperative pinch strength differed between groups, outcomes were compared using ANCOVA.

Results: A total of 96 patients were included: 52 in the arthrodesis group and 44 in the arthroplasty group. The mean follow-up period was 49.6 ± 35.7 months. Demographic characteristics were comparable between groups except for age. VAS, DASH, and MHQ scores improved significantly after surgery in both groups, with no significant differences between them. Tip and key pinch strength were significantly greater following arthrodesis, whereas the Kapandji score was significantly higher after arthroplasty. No major complications were observed in either group. In the subgroup analysis of patients with MCP hyperextension (29 in the arthrodesis group and 17 in the arthroplasty group), there were no significant differences in VAS, DASH, or MHQ scores at the final follow-up. However, the arthroplasty group demonstrated a significantly lower 1–2 intermetacarpal angle, and TM angle, as well as more frequent arthritic changes at the first MCP joint.

Conclusion: In this study, both arthrodesis and arthroplasty resulted in significant clinical improvement in patients with advanced TM arthritis. Arthrodesis was associated with greater pinch strength, while arthroplasty achieved higher Kapandji scores. However, in patients with MCP hyperextension, radiological outcomes were more favorable in the arthrodesis group.

A-0073 ULNAR NERVE TRANSPOSITION ALONE VERSUS ADDITIONAL SUPERCHARGE END-TO-SIDE ANTERIOR INTEROSSEOUS-TO-ULNAR MOTOR NERVE TRANSFER IN SEVERE IDIOPATHIC CUBITAL TUNNEL SYNDROME

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Introduction: The aim of this study was to evaluate the effectiveness of additional Supercharge End-to-Side Anterior Interosseous-to-Ulnar Motor Nerve Transfer (SETS) for intrinsic function recovery, compared to ulnar nerve transposition (UNT) alone, in cases of idiopathic severe cubital tunnel syndrome with a minimum 2-year follow-up.

Methods: Severe cubital tunnel syndrome was defined as patients presenting with atrophy and weakness (Medical Research Council (MRC) strength of the abductor digiti minimi (ADM) less than 3), and CMAP amplitude below 6 mV. The MRC grade of ADM, key pinch strength ratio, grip strength ratio, two-point discrimination, patient-reported outcomes, and major complications were compared between the two groups.

Results: A total of 26 patients were included in Group U (underwent only UNT), and 30 patients were included in Group S (underwent UNT and SETS). Both groups showed improvement in postoperative outcomes during the 2-year follow-up period. At the final follow-up, poor intrinsic function, defined as an ADM MRC grade of 2 or less, was significantly lower in Group S (Group U, 35% versus Group S, 10%; $p=0.025$). The key pinch ratio difference was significantly higher in Group S compared to Group U (Group U, 0.20 ± 0.21 versus Group S, 0.34 ± 0.22 ; $p=0.036$). There were no significant differences in other outcomes between the two groups. In subgroup analysis, age was higher in the poor intrinsic function subgroup within Group U.

Conclusion: Additional SETS appears to improve reestablishment of intrinsic function in idiopathic severe cubital tunnel syndrome with a minimum 2-year follow-up. In this condition, age was the only factor significantly higher in the poor intrinsic function group that underwent UNT alone.

Level of Evidence: III

A-0076 RELIABILITY OF CONCENTRIC AND ECCENTRIC WRIST FLEXION AND EXTENSION MAXIMAL STRENGTH MEASUREMENTS USING AN ISOKINETIC DYNAMOMETER

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Introduction: Wrist muscle strength plays a critical role in upper-limb function and is commonly evaluated using isokinetic dynamometry, which provides an objective measurement of muscle performance; however, the reliability of concentric and eccentric wrist strength measurements in healthy adults using an isokinetic dynamometer remains insufficiently explored. **Aim:** The aim of this study was to investigate the within-session test-retest reliability of concentric and eccentric wrist flexion and extension strength measurements using an isokinetic dynamometer in healthy adults.

Material & Methods: The study was conducted in the outpatient clinic following the approval of the ethics committee. Wrist strength assessments were performed using a isokinetic dynamometer. Participants were positioned in a comfortable sitting position on the isokinetic dynamometer to allow for 90° of elbow flexion and a neutral wrist support. First, a warm-up session consisting of seven consecutive submaximal concentric wrist flexion and extensions at an angular velocity of 90°/s were completed. Following a 2-minute rest period, seven consecutive, maximal-effort concentric flexion and extensions were performed at 90°/s. After another 2-minute rest, the same protocol was repeated for eccentric muscle contractions. The consistency of the three peak torque values was analyzed using the Intraclass Correlation Coefficient (ICC), Standard Error of Measurement percentage (SEM%), Minimal Detectable Change (MDC), and Minimal Important Change (MIC).

Results: A total of 23 participants (mean age 21.82 ± 2.90 years; 16 females) completed the measurements. Within-session reliability was excellent for wrist flexion ((concentric: ICC = 0.99 (0.981-0.997); eccentric: ICC = 0.98 (0.978-0.995)) and extension ((concentric: ICC = 0.98 (0.964-0.992); eccentric: ICC = 0.98 (0.966-0.992)). The standard error of measurement (SEM) percentages were good as 4% and 6% for concentric flexion and extension, and 7% and 9% for eccentric flexion and extension, respectively. The MDC values for concentric wrist flexion and extension were 1.9 and 1.9, respectively, and the MIC values were estimated as 4.1 and 3.2 units of difference, corresponding to 26% and 29% points of change from the mean values, respectively. The MDC values for wrist eccentric flexion and extension were 3.7 and 3.5 respectively, and the MIC values were estimated as 4.9 and 4.8 units of difference, corresponding to 25% and 33% points of change from the mean values, respectively.

Conclusions: The present study demonstrated excellent within-session reliability of isokinetic concentric and eccentric wrist flexion and extension maximal strength measurements in healthy individuals. These results suggest that isokinetic testing is a robust and reliable method for the assessment of wrist muscle strength in both clinical and research settings.

Keywords: Hand, Wrist, Strength

A-0077 NO SIGNIFICANT RELATIONSHIP BETWEEN ISOKINETIC WRIST STRENGTH AND MEASURES OF PROPRIOCEPTION AND HAND REACTION TIME

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Introduction: Wrist muscle function is crucial for effective hand performance and rehabilitation planning. While wrist strength is commonly assessed in clinical practice, the relationship between muscle strength, proprioception, and reaction time remains underexplored.

Aim: The aim of this study was to investigate the relationship between isokinetic wrist muscle strength, proprioception, and hand reaction time in healthy adults.

Material & Methods: Forty eight right hand dominant healthy adults (22.6 ± 3.0 years) participated. The study was conducted in the outpatient clinic following the approval of the ethics committee. Wrist flexor and extensor muscle strength was assessed using a isokinetic dynamometer at an angular velocity of $90^\circ/\text{s}$ in concentric and eccentric modes, with proper stabilization and alignment. After a familiarization set, seven maximal repetitions were performed, and the mean of the three highest values was included in the analysis. Wrist proprioception was evaluated using the same device by measuring active joint position sense. Participants were taught the target angle by moving their wrists between 0° (neutral) and 30° extension, followed by a familiarization phase consisting of six repetitions under eyes-open and eyes-closed conditions. After removing the motion limits, participants were asked to reproduce the 30° target angle three times. The difference between the reproduced and target angles was recorded as the angular error. The mean angular error from the three trials was calculated as the proprioceptive deviation angle.. Hand reaction time was assessed with the Reaction Time Test mobile application, and the mean of three trials was recorded in milliseconds (ms). The associations between the variables were tested using Pearson's correlation coefficient. A significance level of $p < 0.05$ was adopted for all analyses.

Results: Concentric and eccentric wrist strength showed strong intercorrelations ($r = 0.89-0.95$, $p = 0.001$). No significant correlations were observed between any wrist strength measurements and proprioception or reaction time (All $p > 0.05$).

Conclusion: The findings of this study indicate that different types of wrist muscle contractions operate in a state of dynamic balance and are highly interrelated. However, in healthy individuals, wrist flexion and extension strength are not associated with proprioceptive ability or hand reaction time. These results suggest that although the wrist muscles function synergistically to maintain stability, improvements in proprioception or reaction time cannot be achieved solely through strengthening exercises. Therefore, interventions and preventive strategies should focus on specific neuromuscular and sensorimotor mechanisms beyond merely increasing wrist strength.

Keywords: Hand, Strength, Balance

A-0079 A SIMPLE, SINGLE-STAGED PEDICLED ROTATIONAL FLAP WITH LATERAL BAND TENDON GRAFT FOR RECONSTRUCTION OF COMPOSITE DORSAL FINGER DEFECTS

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Composite defects over the dorsal finger are challenging to reconstruct, especially when they involve the eponychium and extensor tendon. We present cases where a single-stage pedicled rotational flap with lateral band tendon graft was used for reconstruction of the composite defect at the dorsal distal or middle phalanx of the fingers. The flap was based on the

dorsal skin branches of the digital arteries at the proximal phalanx and can extend distally to cover eponychial defects. Two of the three patients also had an extensor apparatus defect of 1.0cm or more and were successfully reconstructed with lateral band tendon graft with good functional outcomes. The flaps healed uneventfully. The flap with tendon graft is a simple, reliable, single-staged procedure that provides like-for-like reconstruction and has minimal donor site morbidity.

A-0080 CUTANEOUS COMPLICATIONS FOLLOWING CORTICOSTEROID INJECTIONS

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Background: Local corticosteroid injections are widely used in the management of musculoskeletal conditions; however, the incidence and timeline of associated cutaneous complications, such as hypopigmentation and subcutaneous fat atrophy, remain poorly defined.

Objective: To prospectively evaluate the incidence, timing, and recovery of hypopigmentation and subcutaneous fat atrophy following corticosteroid injections into the dorsal wrist and elbow regions, and to assess the influence of sex, age, and skin shade on these outcomes.

Methods: Demographic data were collected, and patients were followed up monthly for 1 year. Patients with positive skin reactions were followed up for up to 18 months.

Results: A total of 45 injection cases were analyzed. Hypopigmentation was observed in 17 (37.8%) cases, with significantly higher rates after wrist injections than after elbow injections (48% vs. 8.3%; $P=0.017$; odds ratio=9.9; 95% CI: 1.14–93.8). All hypopigmentation cases were observed exclusively in female patients ($P=0.013$; odds ratio=0.037; 95% CI: 0.002–0.689). Subcutaneous fat atrophy occurred in 3 (6.7%) cases after wrist injections and exclusively in women. No significant associations were found between hypopigmentation/subcutaneous fat atrophy and age or skin shade. Hypopigmentation developed between 4 and 10 weeks after injection and fully resolved in all cases, with a mean recovery time of 7.14 months (range: 2–18 months). Subcutaneous fat atrophy showed incomplete recovery in two of the three cases. The difference in recovery rates between the two reactions was statistically significant ($P=0.016$).

Conclusion: Corticosteroid injections into the dorsal wrist carry a significantly higher risk of hypopigmentation than those into the elbow, with a higher predominance among women. This prospective study is the first to provide data defining a clear timeline for the onset and resolution of these skin reactions, offering valuable information to clinicians for patient counselling and management.

A-0081 RESTORING BALANCE – FUNCTIONAL RELEVANCE AND INNOVATIVE REHABILITATION OF THE DISTAL INTERPHALANGEAL JOINT AFTER FLEXOR TENDON INJURY

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Purpose: The concept of balance is fundamental to coordinated hand function; even small disturbances can affect the entire kinetic chain. The distal interphalangeal joint (DIP), though small, plays a decisive role in maintaining this balance. When the DIP becomes stiff – for example after flexor tendon injury, when scar formation and restricted tendon glide impair distal motion – the harmonious interaction within the finger chain is disrupted. Through the quadriga effect, tendon

excursion in neighbouring fingers is reduced, overall grip strength decreases, and the mechanical equilibrium of the hand collapses. This presentation highlights the functional relevance of the DIP and introduces an effective rehabilitation protocol designed to restore structural and functional balance.

Methods: Using two clinical case examples, typical post-immobilization and post-tendon-injury stiffness patterns of the DIP joint were analysed from anatomical and functional perspectives. The developed exercise protocol integrates:

1. Connective tissue and joint mobilization techniques following anatomical tendon glide paths;
2. Active block exercises;
3. Movement education to improve proprioceptive awareness;
4. TERT-based (Total End Range Time) low-load, long-duration stretching;
5. Fine motor control and grip strength exercises; ADL Training
6. Use of exercise splints – serving not only as mechanical aids but also as visual feedback tools, making movement goals visible and supporting active end-range control.

Results: Both case examples demonstrated progressive recovery of DIP mobility, tendon excursion, and grip strength. As joint motion and tendon glide improved, biomechanical balance within the finger chain was gradually restored, resulting in better coordination and functional use of the hand in daily activities. Patients reported renewed confidence in fine motor tasks such as buttoning, writing, and grasping small objects. Importantly, restoring mechanical and tendon balance also contributed to an improved sense of inner balance and self-efficacy, as patients regained trust and confidence in their hand's performance and control.

A-0082 PHOTVOICE TO EXPLORE THE PATIENT EXPERIENCE OF A RELATIVE MOTION ORTHOSIS FOLLOWING HAND INJURY

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Background: Little is known about the patient experience of relative motion (RM) orthoses, or how they impact hand use and participation in occupational roles.

Purpose: To explore the patient experience of wearing an RM orthosis and provide greater understanding for clinician decision making to facilitate optimal outcomes.

Study Design: Photovoice methodology, Qualitative Participatory research

Methods: Purposive sampling was used to identify adult patients prescribed an RM orthosis as part of their therapy intervention for an acute hand injury. This study received ethics committee approval. Participants had two weeks to take photographs on their personal camera device to capture their experience wearing an RM orthosis and its impact on their daily life. Participants shared 15-20 photos with researchers. At a face-to-face interview, five key photographs were selected by participants context and meaning explored in a semi-structured interview.

Interview data transcribed, captions and context of images confirmed by member checking, and thematic analysis completed.

Results: Three participants (aged 22-46 years) shared 42 photos and completed individual interviews. Seven themes were identified: adherence, orthosis factors, expectations and comparisons, impact on activities of daily living, emotions, relationships, and the photovoice experience. RM orthoses allowed freedom of movement enabling participation in a range of occupations. Challenges included water-based activities, computer use and kitchen tasks. Adherence to orthosis wear was high. Participants expectation of orthoses and recovery seemed to contribute to their overall experience, with

RM orthoses viewed favourably when compared to other orthoses and immobilization methods.

Conclusions: Wearing an RM orthosis enabled functional hand use as well as providing challenges completing everyday activities, in individuals with a hand injury. Individuals had different demands, experiences, expectations and emotions associated with wearing an RM orthosis. Results of this study support the importance of balancing therapist goals with patient-centred factors. Photovoice methodology was a positive process for participant reflection.

A-0083 EARLY OCCUPATIONAL-THERAPY INTERVENTION IN THE CONSERVATIVE AND POST-OPERATIVE MANAGEMENT OF CONGENITAL HAND ANOMALIES: A CASE OF RADIAL CLUB HAND WITH THUMB HYPOPLASIA

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Background: Congenital upper-limb anomalies, including radial club hand and thumb hypoplasia, significantly impair hand function, motor skills, and quality of life. Early occupational therapy (OT) integrated with surgical intervention enhances anatomical correction and functional outcomes. This case report details comprehensive OT across conservative and postoperative phases for bilateral hand anomalies.

Case Presentation: A full-term male infant presented at 3 months with bilateral deformities: left complete radial aplasia (Bayne-Manske grade IV) with thumb hypoplasia (grade V) and right floating thumb (grade IV). No family history or developmental delays were noted.

Conservative OT (4–15 months): Initial evaluation revealed limited wrist range of motion (ROM), postural instability, and poor fine/gross motor control. Interventions targeted ROM preservation, contracture prevention, wrist alignment, and bimanual use via passive/active-assisted ROM, stretching, object manipulation, functional training, and modified constraint-induced movement therapy. A custom thermoplastic radial-gutter splint was fitted and adjusted periodically, with caregiver education for home adherence. Serial assessments showed improved bimanual engagement and splint tolerance.

Surgical and Postoperative OT (16–21 months): Left-hand centralization with K-wire fixation occurred at 16 months; wires removed at 18 months. Postoperative OT addressed stiffness, edema, hypersensitivity, scarring, and fine-motor delays using PROM/AROM exercises, scar mobilization, desensitization, edema management, strengthening, and task-specific training. A revised splint ensured stability; home programs reinforced gains. By 21 months, scar mobility enhanced, hypersensitivity resolved, and active grasp/bimanual reaching progressed.

Outcomes: The child demonstrated increased bimanual tolerance, spontaneous reaching, and age-appropriate fine-motor participation, driven by consistent splinting and family involvement.

Discussion and Conclusion: Family-centered early OT optimizes preoperative limb preparation, while targeted postoperative rehabilitation minimizes complications and promotes hand integration. Multidisciplinary, timely OT is essential for superior functional recovery in radial club hand and thumb hypoplasia.

A-0084 A TECHNICAL MODIFICATION OF HOOK PLATE FIXATION FOR BONY MALLET FINGER -AIMING TO SHORTEN OPERATIVE TIME AND MAINTAIN REDUCTION

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Introduction: Hook plate fixation for bony mallet fractures provides the advantages of direct visualization, accurate reduction, and rigid fixation. However, it is associated with disadvantages such as extensive exposure, technical complexity, and prolonged operative time. To overcome these limitations, we developed several intraoperative modifications to simplify reduction and fixation, achieving favorable outcomes.

Methods: Twelve patients who underwent open reduction and internal fixation for bony mallet fractures were reviewed. Five patients received the conventional method—temporary fixation of the distal interphalangeal (DIP) joint in extension followed by placement and screw fixation of the hook plate. Seven patients were treated with a new technique using a specially designed holding forceps that allows simultaneous grasping of the hook plate and reduction of the fracture fragment, followed by fixation with a Medartis Speed Tip screw. The mean age was 34.4 years (new method) and 41.8 years (conventional). The injured digits included the index (2 vs. 1), middle (1 vs. 0), ring (4 vs. 2), and little fingers (0 vs. 2). Operative time, radiographic reduction quality (anatomic vs. non-anatomic), postoperative range of motion (ROM), and complications were compared between the two groups.

Results: The mean operative time was significantly shorter in the new method (21.3 minutes) than in the conventional method (45 minutes). The postoperative mean DIP flexion/extension ROM was 63.3° – 0.8° for the new method and 44° – 5° for the conventional method. Anatomic reduction was achieved in four cases (new) versus one case (conventional). Redisplacement occurred in one case per group; however, the conventional case with significant joint surface loss required reoperation.

Discussion: The Medartis Speed Tip screw, originally designed for fixing small marginal fragments in distal radius fractures, allows direct insertion without predrilling. Its application to bony mallet fixation shortens the steps of temporary fixation and drilling, minimizing intraoperative loss of reduction. Restoration of the articular surface, rigid fixation, and early mobilization are essential principles for achieving good postoperative motion and pain relief in intra-articular fractures. The new method fulfills all these principles and appears to surpass the conventional technique in operative efficiency, reduction accuracy, and clinical outcomes.

Conclusion: The modified hook plate fixation using a dedicated forceps and Speed Tip screw provides reliable, efficient, and reproducible fixation for bony mallet fractures, with superior operative time, reduction accuracy, and range of motion compared with the conventional method.

A-0085 PATIENT-SPECIFIC THREE-DIMENSIONAL PERI-ARTERIAL COSTOCLAVICULAR DISTANCE ON COMPUTED TOMOGRAPHY ANGIOGRAPHY: DIAGNOSTIC THRESHOLD FOR SUBCLAVIAN ARTERY COMPRESSION IN THORACIC OUTLET SYNDROME

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Objective: Objective measurement of the costoclavicular distance (CCD) in thoracic outlet syndrome (TOS) has not been standardized. We aimed to define a three-dimensional peri-arterial CCD on computed tomography angiography (CTA), identify a CCD threshold indicative of subclavian artery compression, and determine demographic factors associated with CCD.

Methods: This cross-sectional study involved patients with TOS who underwent preoperative upper extremity CTA and subsequent surgery between January 2021 and December 2023. For each patient, the symptomatic arm (the more severely affected side in bilateral cases) was analyzed. A deep-learning algorithm segmented the clavicle, first rib, and subclavian artery. The peri-arterial CCD was defined as the minimum clavicle-to-first-rib distance occurring within 1 mm of the subclavian artery. CCD was compared with upper extremity digital photoplethysmography (PPG) obtained during provocative testing; a $\geq 90\%$ reduction in arterial pulse amplitude with 180° shoulder abduction was defined as positive. Receiver operating characteristic (ROC) analysis determined the CCD threshold. Associations between CCD and age, sex, and body mass index (BMI) were examined using univariable and multivariable linear regression.

Results: Fifty-one extremities were analyzed; 33 (65%) demonstrated vascular compression on PPG. The mean CCD was 10.1 ± 3.1 mm overall and was significantly smaller in compression-positive than -negative extremities (9.3 ± 3.5 vs. 11.7 ± 2.8 mm; $p = 0.011$). ROC analysis yielded an area under the curve of 0.71 (95% confidence interval, 0.57–0.85). The optimal CCD threshold was 9.5 mm, providing 61% sensitivity and 78% specificity for detecting subclavian artery compression. In the multivariable analysis, higher BMI ($\beta = 0.40$, $p < 0.01$) and male sex ($\beta = 1.85$, $p = 0.026$) were associated with a larger CCD, whereas age was not ($\beta = 0.03$, $p = 0.239$).

Conclusions: A patient-specific, three-dimensional peri-arterial CCD measured on CTA predicted subclavian arterial compression, with a 9.5-mm threshold showing moderate diagnostic performance. This objective, reproducible metric may help standardize costoclavicular assessment and inform treatment planning in TOS.

A-0086 CORRELATION OF RADIOGRAPHIC CLASSIFICATION OF TRAPEZIOMETACARPAL JOINT OSTEOARTHRITIS AND PATIENT-REPORTED OUTCOME MEASURES

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Background: The Eaton–Littler classification (Eaton & Glickel 1987) is widely used for the radiological assessment of trapeziometacarpal joint (TMJ) osteoarthritis (OA). The clinical relevance has been questioned since no certain correlation have been reported between the radiographic Eaton classifications and patient-reported symptom severity (Hoeffler et al. 2015).

Lack of agreement in the radiographic classification may contribute to the poor correlation between symptoms and radiographic severity. Ladd et al. (2015) modified the 1987 Eaton–Glickel grading system encompassing multiple views to improve accuracy and added a new measurable index: thumb osteoarthritis (ThOA) index based on trapezial height and width radiographic measurements based on a single Robert view. Multiple views seemingly increased reliability and the ThOA index was tested reliable and matched the degree of articular wear in trapezoids excised during surgery. However, the association between ThOA and symptoms is unknown.

The aim of this study is to investigate the correlation between modified Eaton Glickel classification and ThOA index with the patient reported outcome measures (PROM) in patients with painful TMJ OA.

Method:

Outcomes: Primary outcome: Pain on load (numerical rating scale (NRS). Secondary outcomes: Pain at rest (NRS) and Patient rated Wrist and Hand Evaluation (PRWHE).

Participants/inclusion criteria: 150 patients with TMJ OA that had been included in two interventional studies of patients with painful thumb base OA in our department and have completed PROMs. **Exclusion criteria:** lack of radiographs or too poor quality of the radiographs.

Analysis and Results: The correlation between OA grade and ThOA with PROMs will be presented based on an analyze with ordinal logistic regression (PROMs) and the models will be adjusted for age, sex, and pain catastrophizing (Sullivan 1995). **Significance:** It is important to determine if the radiographic classifications reflect the impact of the disease in TMJ OA. **References:** Eaton RG, Glickel SZ. Trapeziometacarpal osteoarthritis. Staging as a rationale for treatment. *Hand Clin.* 1987 Nov;3(4):455-71. PMID: 3693416.

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A-0087 THE SCAPHOLUNATE GANGLION CYST AND LUNATE MORPHOLOGY: A RETROSPECTIVE RADIOGRAPHIC STUDY Jongmin Kim¹, Brittany Raymond¹, Westcott Tubbs², Tyler Kashuv², Andrew Kaiser², Thomas W. Wright¹

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Hypothesis: The ganglion cyst is the most common soft tissue mass found within the hand and wrist. The scapholunate (SL) ligament is a key stabilizer of the wrist and its articulation is the most common location for the development of ganglion cyst. Recent studies showed the morphology of lunate is associated with carpal instability. The purpose of this study was to evaluate if the presence of a ganglion cyst from the SL articulation is associated with lunate morphology and carpal alignment.

Methods: A retrospective review was conducted on 519 patients with a diagnosis of wrist ganglion cyst, identified using ICD-10 codes between January 1, 2018 and October 1, 2023 at a single academic institution. The cohort was divided into a dorsal ganglion cyst group from SL joint (SLC) and volar ganglion cyst group (VC, control group) based on chart review of cyst location. Radiographs and MRI (within 1 year) were evaluated for lunate morphology (Type I vs Type II), scapholunate angle (SL angle), radiolunate angle (RL angle), and ulnar variance for each group. Statistical analyses comparing SLCs and VCs were performed via t-test for continuous variables and the Chi-squared test for categorical variables.

Results: A total of 343 wrists were examined after exclusion criteria, of which 239 were SLC (70%) and 104 were VC (30%). Of the patients with SLC, 101 (42.3%) patients had Type I lunate morphology and 138 (57.7%) had Type II. Of the patients with VCs, 47 (45.2%) had Type I lunates and 57 (54.8%) had Type II. Type II lunates were more prevalent, representing 56.9% of total patients, however, there was no significant association between the location of ganglion cyst and lunate morphology ($P = 0.61$). SL angle was measured to be 51.6 degrees in patients with SLC and 54.1 degrees in patients with VC, which was a significant finding ($P=0.02$). RL angle was 3.5 degrees in the VC group and 0.2 degrees in the SLC group, which was also significant ($P<0.01$). Patients with SLC initially presented on average at age 36, which was significantly lower than the VC group who presented at 44 years on average ($P<0.01$).

Summary Points: In our study, lunate morphology does not affect the presence of ganglion cyst formation from the SL joint. Volar cysts tend to be associated with larger SL and RL angles, likely reflecting subtle carpal instability due to capsular distension or altered joint mechanics, whereas dorsal cysts more often represent localized scapholunate ligament degeneration without overt angular changes. Long-term effects of SLC and VC require further investigation.

A-0089 EMPOWERING HAND SURGEONS WITH POINT-OF-CARE ULTRASOUND: HOW TRAINING IN PERIPHERAL NERVE IMAGING COULD SAVE MILLIONS FOR THE NHS AND RESTORE THE BALANCE OF CARE

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Background: In the UK, the diagnosis of upper-limb nerve entrapments (especially carpal tunnel syndrome, ulnar neuropathy at the elbow) typically involves formal neurophysiological testing (nerve conduction studies and electromyography, NCS/EMG). These tests are costly, time-consuming and sometimes a barrier to timely diagnosis and treatment.

Objective: To evaluate the potential cost savings to the NHS of shifting to a pathway in which suitably trained hand surgeons perform point-of-care ultrasound (POCUS) to screen or diagnose nerve entrapment, reducing need for NCS/EMG. **Methods:** We review the evidence on cost-effectiveness of ultrasound versus NCS/EMG for nerve entrapments, estimate current NHS cost burden of NCS in upper-limb entrapment, and model potential savings under conservative, moderate and high uptake scenarios. **Results:** Published evidence (for example, a U.S. decision-analysis in carpal tunnel syndrome) shows ultrasound as first-line reduces cost per patient compared to NCS/EMG alone. We estimate annual NHS expenditure on NCS for upper-limb entrapments in England at between ~£7m and ~£19m (mid-estimate ~£12m) under current practice. If hand surgeons were trained and empowered to use POCUS as first-line, and if 50-70% of NCS referrals could be avoided, savings of £3-8m per annum appear plausible (with higher savings possible depending on uptake and credibility of ultrasound pathway). **Conclusion:** The adoption of POCUS by hand surgeons presents a realistic opportunity for the NHS to save millions of pounds annually, improve patient experience (faster diagnosis, fewer visits) and streamline care pathways. Implementation would require training, governance, clear protocols and audit of diagnostic accuracy and outcomes, but the potential return on investment is compelling.

A-0090 DECREASED RADIAL INCLINATION REDUCES ULNOCARPAL STRESS IN DISTAL RADIUS MALUNION: A FINITE ELEMENT ANALYSIS

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Hypothesis: Loss of radial inclination (RI) following distal radius malunion may mitigate the mechanical effects of ulnocarpal abutment syndrome, which typically arises from radial shortening. We hypothesized that decreased RI alters carpal bone alignment and reduces stress concentration and reaction forces on the ulnar head and ulnar carpal bones. This study aimed to evaluate the biomechanical effects of varying RI and ulnar variance (UV) on carpal bone stress distribution using finite element (FE) analysis.

Methods: Nine fresh-frozen cadaveric upper extremities were scanned using computed tomography (CT) in neutral wrist position and at 5°, 10°, 15°, and 20° of ulnar deviation. Anatomical FE models and corresponding models with 5°, 10°, 15°, and 20° loss of RI were developed. The distal radial base was fully constrained, and axial loads ranging from 12 to 25 N were applied to the metacarpals. Ulnar impingement was simulated by incrementally displacing the ulna distally in 0.1-mm steps up to 5 mm. Equivalent stress, minimum principal stress, and contact reaction force were calculated at the ulnar head, triquetrum, and the radial and ulnar sides of the lunate. These parameters were compared among the models to determine the effect of RI loss under progressive ulnar impingement conditions.

Results: Equivalent stress, minimum principal stress, and contact reaction force on the ulnar head consistently decreased as RI loss increased. This decreasing trend persisted under simulated ulnar impingement, with greater RI loss leading to

lower stress and reaction force on the ulnar head. Similarly, stress and force on the ulnar side of the lunate were reduced with increasing RI loss. Notably, models with substantial RI loss exhibited a protective effect against stress elevation, even under maximal ulnar displacement. These findings indicate that reduced RI induces a radial shift of the lunate, altering carpal alignment and minimizing direct impact between the ulnar head and lunate. The redistribution of load across the carpal bones diminishes localized stress at the ulnocarpal interface, suggesting that RI loss may mechanically protect the ulnar side of the wrist from excessive load transmission.

Conclusion: Loss of radial inclination following distal radius malunion alters carpal alignment, producing a radial migration of the lunate and reducing the mechanical load transmitted to the ulnar head and ulnar side of the lunate. This biomechanical change appears to exert a protective effect against ulnocarpal impingement by mitigating stress concentration within the ulnocarpal joint. Clinically, in elderly patients with distal radius fractures that heal with decreased RI, the mechanical consequences of ulnar impingement syndrome may be less pronounced. These results suggest that such deformities might be more tolerable in this population, potentially influencing treatment strategies and supporting the consideration of conservative management when functional outcomes are acceptable despite reduced radial inclination.

A-0091 MC1 MAKEOVER : WHEN THE FIBULA GOES FREELANCE, THE THUMB GETS A TUNE-UP !

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Osteoblastoma, a rare and benign bone tumor, tends to be a quiet guest except when it decides to inhabit the metacarpals, where it causes persistent pain (often worse at night), swelling, and alarming radiological signs of lytic, expansive bone destruction. Treatment typically involves surgical resection, followed by careful reconstruction to restore function.

Our star? A 60-year-old left-handed facade installer, who experienced five months of progressive, mainly nocturnal pain in his left first metacarpal. Radiological investigations (CT and MRI) revealed a destructive, expanding lesion with cortical infiltration and soft tissue involvement, raising concern for a malignant tumor initially suspected to be a chondrosarcoma. However, histopathological analysis later confirmed the diagnosis of osteoblastoma.

Following a multidisciplinary tumor board discussion, a two-stage surgical plan was adopted. On February 21, 2025, the first metacarpal was removed, a bone cement spacer placed, and everything neatly pinned with a Kirschner wire. Histopathology confirmed a complete (R0) resection. The patient's postoperative course was smooth, with good wound healing and preserved vascular function verified by Doppler ultrasound.

Six weeks later, our featured patient was ready for act II: the grand reconstruction. The plan? A free vascularized fibula graft paired with a CMC joint arthroplasty using a Touch prosthesis and a MCP arthrodesis. Vascular connections were meticulously established: the graft's artery was anastomosed end-to-side to the dorsal branch of the radial artery (after a positive Allen's test), and the venous drainage was ensured by connecting the graft to the cephalic vein using a 2.0 mm coupler. In doing so, we gave the fibula a second life in its new role.

Once the vascular pulses were in perfect harmony, like a well-tuned rhythm, we left the concert stage.

The show continued without a hitch in the postoperative period. At 5 months post-operative, the patient demonstrated clinical and radiological healed MCP arthrodesis and a good CMC 1 mobility with a Kapandji score of 10/10. He had good thumb IP joint mobility and fully recovered strength with a Jamar grip of 40 kg on the left versus 32 kg on the right, and a key pinch of 8 kg left versus 7 kg right. Vascularity of the bone graft was checked by ultrasound and showed a good in and outflow. Sensory function were completely intact—no zombie finger here! Overall, the patient's hand is back in the game, and the gong can stay silent.

This case highlights the importance of precise tumor resection and thoughtful reconstruction strategies to preserve hand function after major bone loss. We share five-month clinical and radiological follow-up showing lasting results and complete functional recovery. Proof that even when a tumor tries to steal the show, good teamwork can win the day. We will be happy to present the 1-year results at the FESSH meeting 2026!

A-0093 DELAYED FIXATION FOR MISSED MEDIAL EPICONDYLE FRACTURE IN A CHILD: A CASE REPORT WITH LONG TERM FOLLOW-UP

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Neglected pediatric medial epicondyle fractures with intra-articular entrapment are uncommon. The delayed operative management of these fractures is challenging. We present a case of a 7-year old child that was referred to our unit at 3 months following a reported elbow dislocation with painless, restricted range of motion of the ipsilateral elbow. Clinical assessment and radiographic imaging of the elbow revealed an incarcerated medial epicondyle fragment in the joint. Open reduction and internal fixation of the fragment with concomitant ulnar nerve decompression was preferred over fragment excision. The clinical and radiographic outcomes at the final 5-year follow-up were excellent.

A-0094 BICEPS-TO-FLEXOR DIGITORUM SUPERFICIALIS TENDON TRANSFER WITH TENSOR FASCIA LATA GRAFT: A NOVEL TECHNIQUE FOR FINGER FLEXION RECONSTRUCTION AFTER PAN-BRACHIAL PLEXUS INJURY

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Background: Restoring finger flexion following traumatic pan-brachial plexus injury remains a significant challenge due to limited donor nerves and suboptimal outcomes of conventional nerve transfer procedures. Tendon transfers to the flexor digitorum profundus (FDP) often result in clawing deformities and compromised grasp function. To overcome these limitations, a novel reconstructive technique involving transfer of the biceps tendon to the flexor digitorum superficialis (FDS) tendon using a tensor fascia lata graft was developed to enhance functional grasp by optimizing the biomechanics of finger flexion.

Methods: A retrospective review was conducted on 17 patients with traumatic pan-brachial plexus injuries who underwent biceps-to-FDS tendon transfer between 2014 and 2022. All patients had regained at least Medical Research Council (MRC) grade 4 elbow flexion following prior nerve transfer to restore elbow flexion before undergoing the biceps-to-FDS tendon transfer procedure. The surgical technique involved harvesting a tensor fascia lata graft and using it to bridge the biceps tendon to the FDS tendons. Postoperative management included immobilization followed by a structured rehabilitation program emphasizing gradual re-education of finger flexion.

Results: At a median follow-up of 23 months (range, 3–67 months), finger flexion strength reached MRC grade 5 in eight patients, grade 4 in one, grade 3 in three, grade 2 in two, and grade 0 in two. Most were able to perform functional grasping and hooking activities with the affected hand. Improved flexion at the metacarpophalangeal and proximal

interphalangeal (PIP) joints was consistently observed. Reported complications included one tendon rupture and two cases of finger stiffness, all of which were manageable with revision surgery or physiotherapy.

Conclusion: Biceps-to-FDS tendon transfer with tensor fascia lata interposition graft is a reliable and effective option for restoring active finger flexion in pan-brachial plexus injury. By initiating finger flexion at the PIP joint instead of the distal interphalangeal joint, this technique optimizes grasp biomechanics, increases palmar space, and overcomes the limitations of FDP transfers to improve functional hand use.

A-0095 SHORT-TERM OUTCOMES OF PRIMARY INTERNAL FIXATION FOR OPEN FRACTURES OF THE UPPER EXTREMITY

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Background: In the management of open fractures, external fixation followed by delayed internal fixation as a staged procedure is often employed to minimize the risk of infection. However, in upper extremity trauma, early internal fixation is essential to facilitate functional recovery. At our institution, staged operations are not routinely performed. When soft tissue coverage is required for bone or tendon exposure, the wound is managed with either a “fix-and-flap” or “fix followed by flap” approach. We believe that early surgery is critical, as delayed intervention can exacerbate swelling and increase the risk of complications.

Objective: To evaluate the short-term clinical outcomes of primary internal fixation for open fractures of the upper extremity at our institution.

Methods: We retrospectively reviewed 32 patients who underwent inpatient treatment for open fractures of the upper extremity between June 2019 and June 2025. External fixation was used in only one case with a severely comminuted distal radius fracture, in which combined fixation was performed. The mean age was 41 years; there were 25 males and 7 females. According to the Gustilo–Anderson classification, there were 10 type I, 11 type II, 7 type IIIA, 1 type IIIB, and 2 type IIIC injuries. Five patients had isolated upper extremity trauma, while 27 had multiple injuries. We evaluated the interval to internal fixation, postoperative infection, complications, and hospital stay.

Results: The mean time to internal fixation was 2.8 days. One case of superficial infection and one case of deep infection were observed. Complications included one nonunion and one case requiring corrective surgery for residual deformity. The mean hospital stay was 10.8 days.

Discussion: Primary internal fixation with appropriate soft tissue coverage was feasible in all cases. No cases required external fixation for soft tissue stabilization. The infection rate was low, and even in polytrauma patients, early internal fixation—performed concurrently or in parallel with trunk or lower limb surgery—appeared to contribute to better functional recovery.

Conclusion: Early primary internal fixation for open fractures of the upper extremity resulted in favorable short-term outcomes, with a low rate of infection and complications.

A-0096 THUMB CARPOMETACARPAL JOINT SELECTIVE DENERVATION. LONG-TERM RESULTS

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Introduction: Thumb carpometacarpal joint osteoarthritis is one of the main causes of pain and dysfunction in the hand. Its surgical treatment remains a subject of debate. The aim of this study was to analyze the long-term effectiveness and recurrence rate of thumb selective CMC joint denervation.

Method: Cohort study analyzing patients who underwent thumb CMC joint denervation between 2015 and 2020. Demographic data, preoperative and end-of-follow-up VAS for pain, preoperative and end-of-follow-up recall DASH questionnaire, complications, and recurrences were recorded.

Results: Fifty-six patients were identified. There were 13 losses, so 43 patients with a mean age of 49 years were evaluated. The mean follow-up was 8 years and the minimum was 5 years. The VAS for score improved from 5.3 to 2 points ($p < 0.05$). The recall DASH questionnaire improved from 55 points preoperatively to 15 at the end of follow-up ($p < 0.05$). The time to return to activities was 4 weeks. In three cases, there were postoperative dysesthesias that resolved spontaneously. Six patients did not improve after the operation. At final follow-up the symptoms had recurred in 6 cases.

Conclusions: Thumb CMC joint denervation is effective and safe. Pain and disability improve in 86% of cases, and the results are maintained at 8 years in 84% of patients.

A-0097 CAN VASCULAR FLOW CHANGE DURING PROVOCATION MANEUVERS PREDICT SURGICAL FAILURE IN NEUROGENIC THORACIC OUTLET SYNDROME?

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The need for simultaneous first rib resection during supraclavicular scalenectomy in patients with neurogenic thoracic outlet syndrome (NTOS) remains controversial. We have routinely evaluated vascular flow changes during provocation maneuvers through digital photoplethysmography. We asked whether the vascular flow change during provocation maneuvers can predict surgical failure after isolated supraclavicular scalenectomy for NTOS.

Methods: For 50 patients (mean age of 42.0 ± 16.5 years) who underwent supraclavicular scalenectomy for NTOS, we evaluated vascular flow change through digital photoplethysmography during several provocation maneuvers including Roos test, costoclavicular maneuver, and Adson maneuver before surgery. We calculated the adjusted odds ratio (OR) for surgical failure in association with the vascular flow change during each maneuvers with age, symptom duration, electrodiagnostic study findings, and number of visible vertebrae as covariates.

Results: Compared to the resting position, mean vascular flow during Roos test, costoclavicular maneuver, and Adson's maneuver was $46.0 \pm 51.3\%$, $42.9 \pm 48.2\%$, and $85.4 \pm 64.1\%$, respectively. Twelve patients (24%) were classified into surgical failure, and symptom duration (adjusted OR = 1.04, $p = 0.04$) and absent vascular flow during costoclavicular maneuver (adjusted OR = 23.30, $p = 0.01$) were significantly associated with failure.

Conclusions: A quantitative evaluation of the vascular flow changes that occur during provocation maneuvers can aid not only the diagnosis of NTOS but also help determine the optimal surgical treatment. In particular, if patients show absent blood flow during the costoclavicular maneuver, simultaneous scalenectomy and first rib resection should be considered.

A-0098 IS WALANT TECHNIQUE A MORE COST-EFFECTIVE METHOD IN SINGLE-PORTAL ENDOSCOPIC CARPAL TUNNEL RELEASE COMPARED WITH GENERAL ANESTHESIA?

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Introduction: Single-portal endoscopic carpal-tunnel release (eCTR) accelerates rehabilitation, yet most centres still rely on general anaesthesia (GA). Wide-awake local-anaesthesia-no-tourniquet (WALANT) may streamline care, but robust Asian data are scarce.

Method: Adults treated by a single surgeon between August 2021 and December 2024 were retrospectively reviewed. Ninety-one wrists met inclusion criteria (WALANT = 69, GA = 22). Preparation, skin-to-skin, operating-room (OR) occupancy, post-anaesthesia-care-unit (PACU) time, Boston Symptom Severity (SSS) and Functional Status (FSS) scores, and complications were compared with appropriate univariate tests ($\alpha = 0.05$).

Result: WALANT shortened preparation (20.9 ± 8.1 vs 33.5 ± 6.1 min) and eliminated PACU recovery (0 vs 73.7 ± 11.8 min), reducing total OR occupancy by 25 % (42.3 ± 10.3 vs 56.5 ± 8.3 min, $p < 0.001$). Median time to subjective relief fell from 40 to 11 days ($p = 0.002$). Two-month SSS and FSS gains were comparable between groups, and no conversions or major complications occurred.

Discussion: By obviating airway manipulation, narcotics, and PACU dependence, WALANT enhances theatre efficiency and accelerates early functional recovery without compromising safety or symptom improvement. These results support broader adoption of WALANT for ambulatory eCTR across resource-constrained Asian settings.

Conclusions: WALANT offers a safe, efficient, and patient-centred alternative to GA for single-portal eCTR, delivering faster recovery and significant operational savings.

A-0099 SAFETY AND EFFECTIVENESS OF OPEN REDUCTION AND FRAGMENT SPECIFIC PLATING AFTER DISTAL RADIUS FRACTURES AT THE UNIVERSITY HOSPITAL BASEL

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Introduction: Distal radius fractures are frequent injuries, caused by falls on the hyperextended hand. Depending on energy transfer, force vectors and bone quality, a wide spectrum of fracture patterns can occur. Fractures with complex intra-articular or very distal configurations remain a surgical challenge. Based on the three-column theory (Rikli et al, 1995), the four-corner concept (Brink et al, 2011) and Hintringer classification (Hintringer et al, 2020), fragment-specific plating concepts have been developed to restore the anatomy of the distal radius and – consequently – of the wrist joint. The use of preformed anatomical and fragment specific plates reduces soft-tissue complications like tendon irritations. We analysed all patients treated with Medartis APTUS plates for a distal radius fracture. These plates were mainly used for comminuted or very distal volar fractures, that cannot be adequately addressed with conventional volar plating.

Methods: All adult patients treated with APTUS fragment-specific distal radius plates between January 2023 and December 2024 at the University Hospital Basel were retrospectively identified. Demographic, clinical and radiological data were extracted from institutional databases and the fracture registry. Variables included AO-classification, implant type,

fracture healing, complications and hardware removal. Descriptive analyses were performed and tabulated by plate and fracture types. Ethical approval was obtained (EKNZ ID 2025-00606).

Results: Seventy-one patients (67% female, median age 58 years) were included. Fracture types were AO-C (69%), AO-B (17%), and AO-A (14%). FPL plates were most frequently applied (62%), followed by rim plates (18%) and Adaptive II plates (17%); 15% required supplementary dorsal or hook plating. At a median follow-up of 102 days, 67% of fractures were healed and 31% showed progression to union; only one non-union (1.4%) occurred. Severe complications according to Clavien-Dindo (Grade III) were observed in 13% of patients, predominantly tendon irritations or intraarticular screw placement (7%). All of them were successfully revised. Hardware removal was performed in 13%, mainly for plate irritation. No implant breakage, deep infection or loss of fixation was observed. Healing rates and complication rates were comparable across plate and fracture types.

Conclusions: Fragment-specific fixation of distal radius fractures using angular-stable Medartis APTUS plates resulted in reliable fracture healing and a low complication rate in our single-center cohort. A stable fixation of very distal and intra-articular fractures was achieved, however the rate of tendon-related problems remained low. These results support the concept of fragment-specific plating as a safe and effective treatment for complex distal radius fractures.

A-0100 SURGICAL TREATMENT OF NEUROMAS IN SENSORY NERVES IN THE UPPER LIMB USING NERVOUS RELOCATION TECHNIQUES IN THE MUSCLE OR BONE

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Background: Neuromas of the hand and wrist are frequent causes of disabling neuropathic pain and a problem that we encounter every day in outpatient clinics. Its treatment continues to be a challenge and in the literature there are a multitude of techniques described.

Objectives: The objective of the study is to evaluate the effectiveness of nerve relocation inside muscle or bone in the treatment of sensory nerve neuromas.

Study Design & Methods: A retrospective study was carried out on 23 patients operated by the Hand Unit from April 2021 to September 2024 with an average follow-up of 1 year with persistent and severe scarring neuropathic pain due to an injury to the sensory branches of the radial, ulnar or median nerve without improvement with previous surgeries: neurolysis, grafts or encapsulations that did not respond to third-step analgesics, nerve blocks in the pain unit or local application of capsaicin patches with a positive suppressor test.

Nerve relocation is performed at the muscle or bone level depending on the affected nerve.

On average, patients undergo 3 previous surgeries before repositioning.

Epidemiological variables (age, sex, dominant limb, profession) are evaluated and clinical variables (history, range of motion, Tinell), subjective variables (VAS) and the reduction in the need for opioids are studied pre- and post-surgery.

Follow-up is carried out at 3, 6 months and one year, analyzing evolution and complications.

Results: 87% were women with an average age of 54 years and 13% were men with an average age of 52 years. Statistically significant differences were shown between the pre- and post-surgery VAS measurements with an average improvement of 6 points.

100% were right-handed and the affected limb was the right one in 54% of cases.

100% were manual workers. 27% were discharged with an average of 5 months until returning to work

63% do not present post-surgery Tinel. The rest slight residual Tinel.

There were 17% complications: two surgical wound infections and one case of complex regional pain syndrome.

Conclusions: Treatment of upper limb neuromas is challenging with multiple treatment options.

In the literature we do not find conclusive data that supports the superiority of one technique over another.

In our experience, nerve repositioning of sensory nerve neuromas is an intervention, in cases that cannot be improved with other conservative or surgical techniques, that provides good results in pain control, reduction in the need for analgesia and even suppression, and return to work.

A-0104 SURGICAL OUTCOMES OF SEGMENTAL DIAPHYSEAL FOREARM FRACTURES IN ADULTS: A SMALL CASE SERIES ON PLATE OSTEOSYNTHESIS, INTRAMEDULLARY NAILING, AND OTHER SURGICAL METHODS

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Segmental fractures often result from high-energy or indirect trauma that causes bending or torsional forces with axial loading. We evaluated surgical outcomes of patients with forearm segmental diaphyseal fractures. Methods We retrospectively analyzed data from patients with forearm segmental fractures for which they underwent surgery at the Pusan National University Trauma Center from March 2013 to March 2022. We also analyzed accompanying injuries, injury severity score (ISS), injury mechanism, occurrence of open fracture, surgical technique, and treatment results.

for the result, fifteen patients were identified, one with bilateral segmental diaphyseal forearm bone fracture, for a total of 16 cases. Nine of the patients were male. The overall mean age was 50 years, and the mean follow-up period was 16.2 months. Six cases who underwent surgery using plate osteosynthesis achieved bone union without length deformity at final follow-up. Three of seven patients who underwent intramedullary nailing alone underwent reoperation due to nonunion. Six cases achieved bone union at final follow-up, three of which showed length deformity. Three patients underwent surgery using a hybrid method of IM nailing, plates, and mini cables. One patient who underwent surgery with a plate and one patient who underwent surgery with IM nailing alone showed nonunion and were lost to follow-up. so plate osteosynthesis is considered the gold standard for treatment of adult forearm diaphyseal segmental fractures. In this study, IM nailing was associated with high rates of non-union and length deformity. However, the combination of IM nailing and a plate-cable system may be an acceptable alternative in segmental diaphyseal forearm fracture, achieving a union rate similar to that provided by plate fixation.

A-0105 MARKERLESS POSE ESTIMATION FOR FINGER JOINT POSITION SENSE AND ANGULAR VELOCITY: RELIABILITY ANALYSIS AND NORMATIVE REFERENCE VALUES

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Background: Hand proprioception contributes to functional stability through skeletal alignment, joint congruency, ligamentous support, muscle activity, and intact sensory feedback. Objective, feasible assessment of finger proprioception is still limited in routine practice. Objective: To report joint-specific reference values for index-finger joint position sense

(JPS) and angular velocity, and to evaluate measurement reproducibility using a markerless pose-estimation workflow. Methods: Thirty-eight healthy young adults performed three trials for MCP, PIP and DIP joints of both hands under vision occlusion. Participants reproduced presented target angles. From video analyses we derived absolute JPS error (degrees), target angle, and an angular-velocity-based error (°/s). Reliability (intra- and inter-rater) was calculated using ICC(3,1), with SEM and MDC95. Results: JPS error showed a consistent hierarchy (PIP > MCP ≈ DIP). Dominant hand mean (SD): MCP 4.44° (2.71), PIP 5.80° (2.89), DIP 3.81° (2.20); non-dominant: 5.71° (5.41), 7.43° (5.94), 4.93° (6.31). Angular velocity (°/s) was higher at PIP than MCP/DIP: dominant 30.47 (10.84), 14.16 (6.60), 13.18 (6.10); non-dominant 34.03 (11.88), 16.60 (8.76), 15.29 (6.10). Angular velocity error (°/s) followed the same joint order; dominant MCP 4.57 (2.41), PIP 6.87 (3.45), DIP 3.59 (1.57); non-dominant 5.17 (3.46), 7.54 (3.65), 3.81 (2.31). Inter-rater agreement was excellent for target angle (ICC 0.99–1.00; SEM 0.8–1.8°; MDC95 2.2–4.9°) and JPS error (ICC 0.95–0.99; SEM 0.3–1.1°; MDC95 0.8–3.0°). For velocity error, inter-rater ICCs were moderate-to-high (0.79–0.88; SEM 3.1–5.8 °/s; MDC95 8.7–16.0 °/s). Intra-rater agreement was high for target angle (ICC 0.83–0.90), while JPS error and velocity error showed low-to-moderate repeatability (JPS error ICC 0.00–0.49; velocity error ICC 0.05–0.43). Conclusion: Markerless pose estimation produced joint-specific distributions and excellent between-rater reproducibility for target angle and JPS error, supporting its use for standardized outcome measurement. Both joint-position-based (JPS) and dynamic (angular-velocity-based) error measures were more variable within rater; averaging multiple trials or using composite metrics may improve precision. Joint-wise reference values and MDC95 thresholds derived from healthy adults reflect the inherent measurement precision of the markerless workflow, providing methodological reference points that can inform clinical monitoring of sensorimotor impairment.

A-0106 VIRTUAL GONIOMETRIC MEASUREMENT IN PATIENTS WITH HAND AND WRIST CONDITIONS: A DOUBLE-BLIND PSYCHOMETRIC STUDY

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Introduction: Accurate assessment of joint range of motion (ROM) is essential for evaluating and monitoring hand and wrist disorders. ROM represents the coordination and balance between joint stability, soft-tissue elasticity, and neuromuscular control. With the rise of telehealth, virtual ROM measurement tools have become increasingly important, yet their psychometric properties remain underexplored.

Aim: To examine the validity and reliability of virtual versus manual goniometric measurements for assessing wrist and finger ROM in patients with hand and wrist conditions.

Material & Methods: A double-blind, cross-sectional study was conducted in outpatient hand therapy clinics with 42 adults (mean age = 32.2 ± 14.2 years) with hand or wrist injuries. ROM was measured using a manual goniometer and a web-based virtual goniometer (Protractor v3.1.2). Criterion validity was assessed using Spearman's correlation and Bland-Altman analysis. Intra- and inter-rater reliability were evaluated using intraclass correlation coefficients (ICCs), and measurement error was determined through standard error of measurement (SEM) and minimal detectable change at 95% confidence (MDC₉₅).

Results: Manual goniometry was followed by a virtual assessment of 298 joints; 240 joints were analyzed after excluding low-quality images. Virtual goniometry demonstrated strong criterion validity ($p = 0.956$, $p < 0.001$) with minimal bias

(-0.47° ; limits of agreement: -13.35° to $+12.41^\circ$). Intra- and inter-rater reliability were excellent for MCP, PIP, and DIP flexion (ICC = 0.93–0.99), but lower for wrist (ICC = 0.34) and thumb IP flexion (ICC = 0.29). MDC₉₅ values were acceptable ($<16.5^\circ$) for most joints, except the wrist and thumb.

Conclusion: Virtual goniometry demonstrates high validity and reliability for most finger joints, supporting its use in tele-rehabilitation. By enabling accurate and objective ROM assessment, it contributes to understanding the balance between joint mobility and stability that underpins optimal hand function. Further refinements are needed to improve measurement accuracy in more complex joints such as the wrist and thumb.

A-0107 EFFECT OF SCREW POSITION ON MECHANICAL STABILITY IN HUMERAL SHAFT FRACTURE FIXATION: A FINITE ELEMENT STUDY

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Background: In cases of humeral shaft nonunion, screw pull-out of the proximal fragment is frequently observed in clinical practice. This study aimed to investigate the biomechanical mechanism underlying this phenomenon by comparing the mechanical behavior of proximal and distal screws during plate fixation using finite element analysis (FEA).

Methods: A finite element model of a humeral shaft fracture fixed with a 7-hole plate and six bicortical locking screws (three proximally and three distally) was developed using ANSYS software. The humeral head was fixed, and a pendulum motion was simulated with a downward load applied at the distal end, representing the weight of the forearm. Stress, strain, and deformation were analyzed in both the bone and the screws. To assess screw-loosening tendency, the axial force and the toggle moment (moment acting perpendicular to the screw axis) were calculated for each screw.

Results: Greater deformation was observed in the proximal region of the humerus and in the proximal screws compared with the distal region. The axial force along the screw axis was tensile (positive), representing the pull-out direction, in the proximal screws, but compressive (negative) in the two distal screws. The toggle moment likewise increased proximally, suggesting a higher mechanical tendency for screw loosening and pull-out.

Conclusion: Finite element analysis demonstrated that proximal screws are biomechanically more susceptible to pull-out than distal screws in humeral shaft fracture fixation. Clinically, reinforcement of the proximal fixation may be warranted to prevent screw loosening and improve construct stability.

A-0108 LONG-TERM EFFECTIVENESS OF STEROID INJECTIONS FOR TRIGGER DIGITS: A PROSPECTIVE STUDY WITH 10-YEAR FOLLOW-UP

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Introduction: Stenosing tenosynovitis is one of the most common causes of pain and hand disability. Most trigger digits can be cost-effectively and safely treated by corticosteroid injections with a reported successful outcome ranging from 45 to 92% depending on the number of injections but the risk of long-term symptom recurrence after an effective corticosteroid injection remains undefined.

Method: Prospective cohort study of patients successfully injected for trigger finger or trigger thumb in 2015 using the out-of-sheath dorsal web-space technique or the palmar midline technique. Demographic data, comorbidities, Green's classification, recurrence rate and time to recurrence were collected.

Results: The steroid injection was successful in 85/138 cases. Of those 85 successful cases, 75 completed the 10-year follow-up. Mean age was 60 years. Eight cases recurred at 2, 2, 3, 3, 3, 3, 7, and 8 years after treatment. There were no differences according to the green classification. Four cases recurred with the dorsal technique and four with the palmar technique ($p>0.05$). Four cases recurred after achieving success with a single injection and four after achieving success with two injections ($p>0.05$). Recurrence occurred in 6/24 men and 2/61 women ($p<0.05$).

Conclusions: Steroid injections are effective for trigger digits also in the long-term with only a 10% recurrence at 10 years of follow-up. In our series, the recurrence rate was almost 10 times higher in men than in women, which may have implications when recommending the best treatment.

A-0109 COMPARATIVE STUDY OF SURGICAL OUTCOMES BASED ON THE SITE OF TENDON RUPTURE FOR ACUTE TENDINOUS Mallet FINGER

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Objective: Conservative treatment is generally applied for tendinous mallet finger and often yields favorable outcomes. However, several reports have suggested that unsatisfactory results are more frequent in elderly patients or in cases with large extension lag, and the optimal surgical strategy, especially in relation to the anatomical site of tendon rupture, has not been fully clarified. This study focused on the intraoperatively confirmed rupture site in patients who underwent tendon repair for acute tendinous mallet finger and analyzed the relationship between rupture site, patient background, and clinical outcomes.

Materials and Methods: Twenty-one digits in 21 patients who underwent tendon repair for acute tendinous mallet finger were analyzed. The study group included 12 males and 9 females, with a mean age of 57 years. The affected digits were the index finger in 1 case, middle finger in 2, ring finger in 13, and little finger in 5 cases. The rupture site was identified intraoperatively as either at the distal phalangeal insertion or within the tendon substance. In insertional avulsion ruptures, the tendon was repaired using two suture anchors in the distal phalanx, whereas in substance ruptures, direct end-to-end suture was performed. After repair, the distal interphalangeal (DIP) joint was immobilized with percutaneous pinning for 6–8 weeks. Patients were divided into two groups by rupture site: group A (insertional avulsion rupture, $n=10$) and group S (substance rupture, $n=11$). The following variables were compared: sex, age at surgery, pre- and postoperative extension lag, active DIP joint range of motion (ROM) at 6 months, and outcomes based on Kanie's criteria (Excellent, Good, Fair, Poor).

Results: There was no significant difference in sex distribution between the groups (A: 5 males/5 females; S: 7 males/4 females). The mean age was significantly higher in group A (68 years) than in group S (49 years). The mean preoperative extension lag was greater in group S (55°) than in group A (44°). At 6 months, extension lag improved markedly in both groups, to 6.7° in group A and 4.6° in group S, with no significant difference. The mean DIP joint ROM was 43° in group A and 51° in group S, also not significantly different. According to Kanie's criteria, results were Excellent/Good/Fair/Poor in group A (4/4/2/0 digits) and group S (7/3/1/0 digits), respectively. Both groups achieved favorable results without significant differences in postoperative function.

Discussion: Insertional avulsion ruptures were more frequent in older patients,

whereas substance ruptures occurred in relatively younger individuals and were associated with greater preoperative extension lag. Despite these differences, postoperative recovery of extension and DIP joint motion was comparable between the rupture types. These findings suggest that when properly repaired and immobilized, both insertional and substance ruptures of the extensor tendon can achieve good functional outcomes. Although conservative management remains the first-line treatment for acute tendinous mallet finger, surgical tendon repair may be a reasonable option for elderly patients or those with severe extension lag—factors associated with poor results after nonoperative treatment. Careful patient selection and precise intraoperative assessment of the rupture site are essential for successful outcomes.

A-0110 ULTRASOUND SUPPORTED HAND THERAPY” IS AN ADDED VALUE IN THE TREATMENT OF HAND INJURIES. A PRELIMINARY EVALUATION AND CRITICAL REMARKS

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Hypothesis: “Ultrasound Supported Hand Therapy” (USHT) an added value in the treatment of hand injuries.

Introduction: Ultrasound imaging is a current practice in medicine and the quality is dependent on the skills of the examiner, the settings, and the machine. Low-cost devices have become available that enable therapists to apply this technology in their practice.

Patient education is a crucial component of a successful treatment. However, some words are too abstract to understand for the patients and with ultrasound one can give real-time information about an injury because the power of an image is strong.

Methods: Patients who received USHT (n=38) received an e-mail or a text message with a link to a questionnaire form, five questions were asked, and one could answer anonymously. Questions 1 to 3 were scored between 0 and 5, respectively “absolutely not” and “definitely”. Questions 4 and 5 were yes/no questions.

1. Did you find the ultrasound an added value in the treatment?
2. Did the ultrasound help you better understand your injury?
3. Do you think that your rehabilitation process is better because of the extra information you obtained through the ultrasound?
4. Do you think that something extra should be charged for this high-tech service?
5. Would you recommend this approach (standard therapy + ultrasound) to another person

Results: 20 patients answered the call of this survey. The score of the first question was 4,70 (sd 0,47) or 94%; while it was for the second question 4,60 (sd 0.60) or 92%. The question about the impact on the rehabilitation process was scored with 4,10. (sd 0,85) or 82%.

75 % of the patients found that the therapist could charge something extra for the investment and 95% of the patients would recommend USHT to another person.

Critical notes for therapist perspective

Ultrasound is a novel skill to be learned and mastering this skill is difficult with a long learning curve.

One must be careful for the accurate interpretation of the images. Due to a lack of knowledge and experience, false alarms could be communicated towards the patients.

Scanning takes time, certainly in the beginning phase.

One must be aware that scanning time reduces active therapy time.

Final note, is it really worth the investment?

Conclusion: USHT (Ultrasound in Hand Therapy) offers substantial benefits for both therapists and patients. For therapists, it enhances anatomical understanding, supports follow-up care, and advances scientific work. For patients, it improves insight into their condition and treatment, leading to a more engaging experience. Importantly, patients value USHT enough to pay for it—highlighting its potential for wider implementation.

A-0111 PYRODISK THUMB CMCJ IMPLANT FOR THE YOUNG ACTIVE MALE PATIENTS - OUR RESULTS FROM THE LAST 12 YEARS

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Aim: The aim of our study is to review the results of the Pyrodisk implants in our Unit using PROMS and survivorship analysis

Methods: All pyrodisk implants that were inserted from 2013 to 2021 in male patients where traced using our implant book registries and the operating coding. The patients electronic records were also reviewed.

All the patients were contacted by phone to collect a QuickDASH score and to confirm that no further operations were performed to their CMCJ in another hospital. Comments about their thumb function and satisfaction was reported as well.

We identified 25 Pyrodisk implants in 19 patients

Results: We had 25 Pyrodisk implants. Mean age of our patients was 59.6 years of age (CI95% 55.5-63.6)

Follow up was between 4 and 12 years with a mean of 8.2 (CI95% 7.3-9.1)

Mean QuickDASH score was 16.7 (CI95% 7-26.4)

There were no revision surgeries. Bringing the survivorship to 100%.

Excellent comments were also reported by patients during the telephone call.

Conclusions: To summarise our results showed an excellent survivorship of the Pyrodisk implant in young males with very good QuickDASH scores. It is a good alternative to a CMCJ arthroplasty with more bone preservation, that would have been a suitable choice for this cohort group.

Our limitations are lack of pre-op PROMS and other outcome measures such as ROM and Radiological findings.

A-0112 A FAST-TRACK PATHWAY IN COMPLEX REGIONAL PAIN SYNDROME OF THE UPPER EXTREMITY: PRESERVING BALANCE THROUGH EARLY INTERVENTION

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Introduction: Complex Regional Pain Syndrome (CRPS) of the upper extremity disrupts the balance between sensory, motor, and autonomic domains essential for hand function. Delayed diagnosis and fragmented care may lead to irreversible progression. In 2020, a structured fast-track pathway (FTP) was introduced at a Swiss tertiary hospital to expedite recognition and coordinate multidisciplinary management

Methods: We conducted a retrospective cohort study with a historical control group (pre-FTP: 2015–2019; post-FTP: 2020–2023) restricted to patients with upper extremity CRPS. All patients were identified via standardised screening and fulfilled Budapest criteria and grouped by location of injury (hand, elbow or shoulder). The primary outcome was referral delay (time from inciting event to first specialist consultation), and the secondary outcome was clinical improvement at

12 months, defined by physician assessment of pain, function, or distress. Logistic regression and generalised additive modelling (GAM) tested the prognostic role of referral latency.

Results: Ninety-six patients were included (39 pre-FTP, 57 post-FTP). Referral delay decreased from a median of 715 to 130 days ($p<0.001$). At 12 months, 72% of post-FTP patients improved versus 23% pre-FTP (risk difference 49.1%, 95% CI 29.0–63.7; number needed to treat 2.1 for <6 months). Post-FTP cases more often presented with CRPS type I (91% vs. 66%, $p=0.005$) and showed fewer autonomic abnormalities (temperature, colour, sweating, oedema; all $p<0.01$), reflecting earlier disease stages. Longer disease duration independently predicted poorer outcomes (OR per day 0.999, $p=0.03$). GAM confirmed a non-linear decline in recovery probability, with a sharp drop beyond six months ($p<0.001$). Conclusions: Earlier stages of CRPS remain reversible, whereas diagnostic delays promote pain chronification and progressive functional loss. These findings indicate a critical therapeutic window in which timely referral can preserve recovery potential. In upper extremity CRPS, a structured fast-track pathway halved diagnostic delay and tripled one-year improvement rates. For hand surgeons and pain specialists, early recognition and referral are essential to safeguard the physiological balance that enables hand function and to prevent irreversible disability

A-0114 THE CYPRUS TETRAPLEGIA HAND SURGERY SERVICE (TETRAHAND CYPRUS). 10 YEARS ON, WHAT HAVE WE ACHIEVED?

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Background: The service was created in 2015 and in October 2025 we celebrated our tenth anniversary. The service was created to meet the needs of the spinal cord injury patients of Cyprus as well as patients suffering from spasticity of the upper limb, who wanted to improve the function of their hands. We aim to present our results regarding the procedures that we offered and our advice into how to build and sustain such a service

Materials and Methods: This is a retrospective study. Since 2015, and with a four years hiatus from 2020 to 2024 due to the COVID pandemic, we operated on 12 patients with reconstructive procedures on the upper limb and who have suffered some sort of SCI (15 procedures in total). Additionally, we operated also on 31 patients with spasticity of the upper limb. Six patients had a posterior deltoid to triceps tendon transfer, seven patients had a grip reconstruction procedure, one patient had a biceps to triceps transfer and one patient had spasticity reduction surgery. Evaluation was done with the COPM prior and after the surgery as well as the ability to transfer independently. The spasticity patients had a single multilevel procedure and our most common procedures were the release of the pectoralis major, the release of the pronator teres, the ECU to ECRB transfer and segmental lengthening of all digital flexors as well as wrist flexors.

Results: Five out of six patients with the posterior deltoid to triceps transfer had a satisfactory result which allowed them to transfer independently and drive their wheelchairs better. One patient was never able to fire his posterior deltoid to triceps transfer and eventually this led to loosening of the transfer due to poor compliance. The biceps to triceps patient were very pleased with the outcome of his procedure because it allowed him better body stability. Unfortunately, this patient passed away one year later due to COVID related complications. All the grip reconstruction patients were able to achieve their targets and had increased COPM scores compared to before surgery. Three patients returned to have additional procedures (grip reconstruction in the contralateral upper limb, grip reconstruction following a triceps reconstruction). The spasticity patients had significant reduction of their spasticity which yielded in better balance, elbow opening, wrist extension and a more useful grasp.

Conclusions/discussion: These procedures are well established and are known to work very well. In our experience from

a small regional hospital, we confirm we that these procedures are safe, can yield optimal results for the right patients and should be offered to any suitable patient.

A-0115 ISOLATED FLEXION STIFFNESS OF THE TRAPEZIO-METACARPAL JOINT FOLLOWING POST-TRAUMATIC THENAR MUSCLE FIBROSIS

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Background: Uncommon isolated flexion stiffness of the trapezio-metacarpal (TM) joint resulting from post-traumatic thenar muscle fibrosis.

Case presentation: We report the case of a 47-year-old woman who developed isolated flexion stiffness of the TM joint after a thumb distortion injury. Clinical examination showed a TM joint locked in flexion with preserved interphalangeal and metacarpophalangeal motion and no neurovascular deficit. Imaging (X-ray and ultrasound) was normal, but MRI revealed fibrotic changes within the thenar musculature. At five weeks post-injury, surgical arthrolysis revealed no capsular adhesions but organized fibrotic tissue within the abductor pollicis brevis, flexor pollicis brevis, and opponens pollicis muscles. Histopathology confirmed a pauci-cellular fibrotic scar without inflammation. After excision, full passive range of motion was restored. Postoperative rehabilitation with splinting and dynamic exercises led to complete functional recovery at six months.

Discussion: This case likely resulted from a closed thenar muscle tear with hematoma formation, followed by excessive fibroblast proliferation and dense scar development. Prolonged immobilization may have contributed to fibrosis, while early mobilization could potentially have prevented stiffness. Although treatment of established muscle fibrosis remains challenging, emerging biological therapies targeting the TGF- β pathway or extracellular matrix degradation offer future perspectives.

Conclusion: Early recognition of post-traumatic thenar muscle tears and prompt mobilization are essential to prevent disabling fibrosis. When conservative management fails, surgical release can achieve excellent outcomes.

A-0116 AUTOLOGOUS REPLACEMENT OF THE LUNATE FOR THE TREATMENT OF KIENBOCK'S DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Kienböck's disease is avascular necrosis of the lunate causing wrist pain, functional impairment, and osteoarthritis. Autologous lunate replacement with tendon arthroplasty, local pedicled osteochondral flaps, or free flaps has emerged as a joint-preserving alternative to prosthetic implants or salvage, aiming to restore carpal mechanics. This systematic review evaluated outcomes of autologous lunate replacement for Kienböck's disease.

Methods: MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched for studies with ≥ 6 months follow-up using tendon arthroplasty, local flaps, or free vascularised bone flaps. Outcomes included pain, motion, grip strength, carpal alignment, complications, and reoperations. Pooled estimates used random-effects meta-analysis.

Results: 35 non-randomised studies (n=593) were included. Tendon arthroplasty (palmaris longus, extensor carpi radialis longus or pronator quadratus with or without bone core) was reported in 17 studies (n=306), yielding flexion 46.6°, extension 47.9°, grip strength 75.4%, and complication/reoperation rates 6.5%/1.3%. Local pedicled osteochondral flaps—including capitate osteotomy (Graner), vascularised os pisiform (Saffar), and pedicled scaphoid—were described in 13 studies (n=189), with flexion 45.2°, extension 44.6°, grip 80.9%, and complication/reoperation 8.7%/4.1%. Free vascularised femoral trochlea flaps in 6 studies (n=98) achieved flexion 46.4°, extension 42.7°, grip 82.7%, but with higher complication (25.5%) and reoperation (8.5%) rates.

Conclusion: Autologous lunate replacement appears to preserve motion, relieve pain, and maintain function in patients with Kienböck's disease. Tendon arthroplasty remains the simplest technique but may provides lower grip strength. Local pedicled osteochondral flaps yield intermediate results with moderate strength recovery, while free osteochondral flaps tend to offer better grip and carpal alignment at the cost of higher technical complexity and complication rates.

A-0117 VAMPIRE FLAP TECHNIQUE: COMBINING CHIMERIC ALT-TFL AND INGUINAL FLAPS TO EXTEND RECONSTRUCTIVE COVERAGE IN NECROTIZING FASCIITIS OF THE UPPER LIMB

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Introduction: Necrotizing fasciitis can cause extensive soft-tissue loss that exceeds conventional flap capacities, jeopardizing both protection and function. We report a novel “vampire flap” strategy combining a chimeric anterolateral thigh (ALT)-tensor fasciae lata (TFL) flap with an inguinal flap vascularized through the ALT. This concept expands the reconstructive reach of standard flaps and enables staged restoration of coverage and function in complex upper-limb defects.

Case presentation: Following extensive debridement of necrotizing fasciitis involving the forearm, hand dorsum, and thumb, a 45 cm chimeric ALT-TFL flap provided initial coverage of the tendons and neurovascular structures, while an 20cm inguinal flap, vascularized through the ALT in a vampirization technique, extended the reconstruction to the thumb. Secondary procedures restored the thumb–index pinch and commissure leading to progressive recovery of grasp and functional independence.

Conclusion: This case demonstrates that combining chimeric ALT-TFL flap with an inguinal flap, drawing its vascular supply from the first, can safely extend reconstructive coverage beyond conventional limits. This strategy uses inter-flap vascular integration to expand the anatomical and functional reach of standard techniques.

A-0118 ASSESSMENT OF SCAPHOID MOBILITY IN PATIENTS WITH SUSPECTED SCAPHOLUNATE INSTABILITY: A RADIOGRAPHIC AND FOUR-DIMENSIONAL COMPUTED TOMOGRAPHY STUDY

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In chronic scapholunate instability (SLI), the scaphoid is flexed and pronated, with its proximal pole dorsally displaced relative to the radius. When considering ligament reconstruction, scaphoid mobility and its vertical repositioning are key criteria in balancing conservative and palliative treatment options. Determining whether a scaphoid is reducible

requires assessing its amplitude in flexion–extension. To our knowledge, no existing method provides a quantifiable and reproducible measurement of scaphoid mobility, and therefore of how well the instability can be corrected.

The anteroposterior intrascaphoid angle (APISA) has been used to measure scaphoid angulation on anteroposterior radiographs in cases of non-union. The variation of radioscapoid angle (RSA) on dynamic four-dimensional computed tomography (4DCT) provides a quantitative analysis of the carpus mobility during wrist radioulnar deviation. We hypothesised that APISA measurements on dynamic radiographs and RSA analysis on 4DCT could assess scaphoid mobility in patients with chronic suspected SLI.

We conducted a prospective study to evaluate the validity and reliability of APISA on dynamic radiographs and RSA on 4DCT as indicators of the amplitude of scaphoid flexion–extension. We also assessed the contribution of these two markers, relative to the stage of SLI, in identifying reduced scaphoid mobility. One hundred and fifty patients with suspected chronic SLI were included and classified as having no instability, dynamic instability, or static instability. For each patient, anteroposterior radiographs in radial and ulnar deviation were obtained, and dynamic CT scan was recorded during radioulnar movements. Measurements were performed independently by two readers.

Interobserver agreement for both radiographic and 4DCT measurements was good (ICC: 0.885 [0.713–0.947]). In each group, APISA and RSA range values were positively correlated (no instability: $r = 0.79$, $p < 0.001$; dynamic instability: $r = 0.81$, $p < 0.001$; static instability: $r = 0.77$, $p < 0.001$). Wrists with dynamic instability showed values similar to those without instability ($p > 0.05$). In contrast, mean values were significantly decreased by approximately 35% in wrists with static instability compared with those without instability ($p < 0.01$ for APISA; $p < 0.001$ for RSA). Among wrists with static instability, nine (24%) exhibited markedly reduced values —less than 50% of the mean values observed in the static instability group. These scaphoids could be considered non-reducible given their very limited flexion–extension amplitude relative to the others.

Our findings confirm the validity and reliability of APISA and RSA measurements for assessing the amplitude of scaphoid flexion–extension. These results suggest that impaired scaphoid mobility is associated only with the static stage of instability. The thresholds below which scaphoid mobility is markedly reduced should be interpreted cautiously, as they represent preliminary estimates based on a limited sample. However, as no reference values for non-reducibility currently exist, these findings highlight the need for further research. They may provide clinically relevant guidance for managing chronic scapholunate instability, particularly when deciding between ligament reconstruction and palliative procedures.

A-0119 OUR RESULTS OF HYPERSELECTIVE NEURECTOMY IN PATIENTS WITH ELBOW FLEXOR SPASTICITY. WHY IT IS OUR PREFERRED TECHNIQUE TO RESTORE THE BALANCE OF THE ELBOW

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Introduction: Spasticity of the elbow flexors is very common in patients with CP, traumatic brain injury or post stroke. It is one of the main complaint of these patients and it is a deformity that almost always needs to be addressed in conjunction with other procedures. Traditional methods included biceps tendon lengthening and brachialis lengthening through an extended incision in the antecubital fossa. Postoperatively these patients required prolonged immobilisation. We present our retrospective results in patients with elbow flexor spasticity following hyperselective neurectomy of the musculocutaneous nerve.

Materials and methods: We offered this procedure to nine patients from April 2024 to October 2025. Two of those patients had previously biceps tendon lengthening and lengthening of the brachialis muscle. The spasticity of the elbow flexors

was assessed with preoperative videos as well as patient perceived satisfaction. Five patients also complained about dystonia of the elbow flexors which caused their elbows to flex, triggered when doing certain activities like walking. The procedure was done with a medial approach to the arm, the musculocutaneous nerve was identified to biceps and brachialis and the majority of the branches going towards the muscles were diathermied. On average, we left behind 2/7 branches. In one patient we sacrificed entirely the brachialis branch and in one patient we just left one branch going towards the biceps and brachialis respectively. The procedure was combined in all patients with other procedures for spasticity reduction

Results: All nine patients maintained active flexion of the elbow with MRC 4/5. The dystonic patients were the most pleased as their elbow flexors firing was not as bad as before and it would allow them a better walking posture and balance. All patients mentioned a significant reduction in spasticity of the elbow flexors. To the day, we had no recurrence of spasticity although our series has, to date, a small follow up time. There was also a significant reduction in the Ashworth scale. One of the patients due to very severe spasticity, had to have also a lengthening of the biceps tendon and the brachialis muscle concomitantly. No other complications were noted.

Conclusion: We found the hyperselective neurectomy of the musculocutaneous nerve to the biceps and brachialis a successful and safe procedure. These results are easily reproducible and it has become our preferred procedure for spasticity of the elbow flexors.

A-0120 MANAGEMENT OF RECURRENT AGGRESSIVE GIANT CELL TUMOUR IN THE SECOND METACARPAL WITH AN INNOVATIVE TECHNIQUE WITH 3D PRINTED PLANNING AND RECONSTRUCTION WITH A CUSTOM-MADE IMPLANT
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Introduction: Giant cell tumour (GCT) of bone is a relatively common type of benign tumour involving the epiphyseal region of tubular bones such as the femur, tibia, and humerus. GCT of hand bones have an incidence of around 1–4 %. Although GCT are benign tumours, they can be locally malignant, and they have a higher recurrence. The recurrence rate of GCT in the literature was found 27 to 65 % after isolated curettage, 20 to 35 % after curettage with adjuvants, and 10 to 15 % after en bloc resection.

Material and Methods: Patient female with 58 years-old that underwent surgery at another center with a diagnosis of GCT of the second metacarpal of the hand which was confirmed by core needle biopsy. A curettage with bone grafting was made. Two years later, the patient presented a recurrence of the tumour, with aggressive tumour growth. On physical examination, the patient had been a palpable tumour, painful swelling on the dorsum of the hand, associated with limited second and third metacarpophalangeal (MCP) joint range of motion. Anteroposterior and lateral radiographs as well as CT scan of the right hand showed a lytic expansile lesion involving the diaphysis and head of the second metacarpal bone with and extension of the lesion to the distal articular surface.

For this second operation we carried out an innovative technique with 3D planning and printing of a custom-made implant of the second metacarpal (non-ferromagnetic titanium-Osteobionix[®]). Implant fixation to the third metacarpal and MCP joint stabilization by means of a half of the EIP tendon.

Results: One year after the surgery, MCP mobility was 5° extension/70° flexion. The patient can perform tip, lateral and palmar pinch. No pain. Additional tests indicate no tumour recurrence. GCT have been associated with bony destruction, swelling and recurrence. Various treatment modalities found in the literature include curettage with or without bone grafting, wide resection and tricortical iliac crest bone grafting and ray amputations. Innovative surgical technique include transplantation of 4th metatarsal to replace the affected second metacarpal bone. In our case report we presented the option of 3D planning and printing a custom prosthesis to reconstruct the hand after tumour resection and to preserve hand function.

Conclusion: 3D planning and printing of custom made prostheses should be considered as an excellent reconstruction option in aggressive hand tumours, such as in a metacarpal recurrence of the GCT.

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A-0121 IMPACT ON INSTABILITY OF THE DISTAL RADIOULNAR JOINT ASSOCIATED WITH GALEAZZI FRACTURE-DISLOCATIONS IN THE FOREARM

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Introduction: In order to evaluate the impact on instability of the distal radioulnar joint (DRUJ) in Galeazzi fracture-dislocations a systematic review was performed. The review protocol was registered with Prospero (ID 148345 CRD).

Material and Methods

The Medline database was searched from 1946 to 25 January 2019 and Embase via Ovid, Cinahl databases were searched from 1974 to 25 January 2019. We found 1088 records identified through database searching. Neither randomised controlled trials (RCTs) nor prospective cohort studies of adults were found. Case series in adults with conservative and surgical treatments for wrist instability associated with Galeazzi's fracture-dislocations were included. Data were extracted and checked for accuracy and completeness by pairs of reviewers. Retrospective observational cohorts and case series published with a number of patients equal to or greater than 15 were included. We assessed the studies with process checklist and tidier checklist. Only studies published in a peer-reviewed English-language journal and French-language journal were included.

Results: Out of 1088 studies records identified through database searching. 1053 records remained after duplicates were removed. 998 records that were not the objective of this study and 45 full-text articles were excluded with reasons (exclusion criteria). Ten studies in quantitative and qualitative synthesis were included. DRUJ was stable in 294 patients (58.5%) and unstable in 206 patients (41.5 %). Other complications in addition to DRUJ instability occurred in 50 patients (9.9 %). Unstable DRUJ dislocation associated with Galeazzi fracture-dislocation had been treated with temporary K-wire pinning followed by immobilization with forearm fully supinated with a cast splint. Complications associated with the surgical treatment in Galeazzi fracture-dislocation were: postoperative palsies of the posterior interosseous nerve, chronic regional pain syndrome, nonunion, malunion, infection, and residual DRUJ instability. The final functional evaluation of

these studies has been carried out with three different scales: system of Anderson et al. in 5 articles, Mikic's criteria in 3 articles and Mestdagh's criteria in 2 articles.

Conclusions: There is a high rate of DRUJ instability associated with Galeazzi fracture-dislocations. Appropriate surgical treatment minimizes chronic instability and pain. Systematic review indicates that case series are highly heterogeneous as are the assessment scales. Further research is necessary in order to better define which patients benefit from which specific interventions.

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A-0123 NAVIGATION IN THUMB CMC TOTAL JOINT ARTHROPLASTY: A CLINICAL FEASIBILITY STUDY

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Three-dimensional (3D) navigation has been successfully implemented in large joint arthroplasty surgery to enhance the accuracy of implant positioning and thereby improve postoperative outcomes. Owing to recent technological advancements and miniaturization, similar navigation systems have become feasible for hand surgery.

The aim of this study is to assess the accuracy and feasibility of 3D navigation for cup placement in the trapezium during thumb trapeziometacarpal total joint arthroplasty.

We conducted 20 thumb CMC total joint arthroplasties with the aid of a navigation system.

Cup placement accuracy was assessed after surgery and compared with the preoperative planning.

A-0124 INTRAFOCAL INTRAMEDULLARY THIN WIRE FIXATION FOR EPIPHYSEAL INJURY OF PROXIMAL PHALANGEAL BASE IN CHILDREN

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Objective: For children with severe displacement of the epiphyseal injury of the proximal phalanx base, conservative treatment using external fixation after manual reduction is common. However, in cases where reduction is insufficient due to swelling of the patient's hand or instability after reduction, external fixation may not be sufficient. Therefore, we attempted a minimally invasive surgical method that allows joint motion. We describe intrafocal intramedullary thin Kirschner wire (K-wire) fixation for epiphyseal injuries of the proximal phalangeal base in children and report the postoperative results and its usefulness.

Methods: Eleven patients (5 females, 6 males) with 12 epiphyseal injuries of the proximal phalangeal base (1 thumb, 1 index, 2 middle, 2 ring, and 6 little fingers) were included; one patient had injury of two adjacent fingers. Seven were Salter-Harris type II, and five were juxta-epiphyseal fracture type II with displaced and unstable injury. The mean patient

age at the time of injury was 9.4 years, the mean interval from injury to surgery was 2.8 days, and mean postoperative follow-up was 8 months.

Surgical technique. Surgery was performed under local anesthesia and image intensification. On the side of the laterally displaced fracture, a 0.7-mm K-wire with a bent tip was inserted percutaneously from the side of the extensor tendon proximal to the metacarpophalangeal joint to the fracture site. The dorsiflexion and lateral displacement of the proximal phalanx are reduced, and a K-wire is inserted from the fracture site toward the intramedullary canal of the distal fragment. During surgery, the patient was asked to perform active flexion and extension of the fingers to confirm that there was no overlapping. After surgery, early joint movement was encouraged through buddy tapping with the adjacent fingers. The K-wire was removed approximately three weeks after surgery.

Results: Nine fingers used one K-wire, and three fingers used two. There was no infection at the site of wire insertion during the postoperative course. After surgery, full extension and full flexion of the fingers were restored in all patients. The diaphysal axis-metacarpal head angle was 156.6° before surgery, 178.3° immediately after surgery, and 178.5° at follow-up, and the postoperative reduction was maintained. There was no overlapping of the fingers due to malunion, and no cases of functional impairment of the hand.

Conclusion: This method is useful in that it can hold the distal fragment in the optimal position by inserting a single intrafocal intramedullary pin from the displaced side of the epiphyseal injury.

A-0125 LIGAMENT RECONSTRUCTION AND SIGMOID NOTCH OSTEOPLASTY FOR RECURRENT VOLAR DISLOCATION OF THE ULNA DUE TO DISTAL RADIOULNAR JOINT INSTABILITY; A CASE REPORT

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Objective: Recurrent volar dislocation of the ulnar head due to distal radioulnar joint (DRUJ) instability is relatively rare. We report this case in which DRUJ ligament reconstruction and radial sigmoid notch osteotomy were performed, resulting in satisfactory long-term results.

Case: The patient was a 29-year-old male at the time of his initial consultation. He had a history of right wrist injury while playing rugby at age 20, when he was a student. In his late 20s, he visited our hospital complaining of repeated wrist pain and a sense of dislocation when supporting himself with his hand. A positive ballottement test of the ulnar head revealed severe instability of the DRUJ. MRI revealed avulsion of the TFC from the ulnar fossa, and CT revealed blunting of the volar edge of the radial articular facet of the DRUJ. The patient underwent ligament reconstruction as described by Adams (2002) and sigmoid notch osteoplasty as described by Wallwork (2001). In the long-term follow-up 13 years after surgery (at age 42), bone resorption and mild arthritic changes were observed in the ulnar neck, but the range of motion was full, and no pain or DRUJ instability was observed. The modified Mayo Wrist Score was 100 points, and the Quick DASH score was 29 points before surgery, but was 0 points at the time of follow-up.

Conclusion: Recurrent ulnar head dislocation due to DRUJ instability was thought to have caused the flat face of the sigmoid notch. For this condition, ligament reconstruction and sigmoid notch osteoplasty were performed simultaneously, resulting in satisfactory long-term results. This technique has the advantage that the grafted tendon can hold the bone grafted into the sigmoid notch osteoplasty from above.

A-0126 ANALYSIS OF CORRELATION BETWEEN THENAR MUSCLE THICKNESS BY ULTRASONOGRAPHIC EVALUATION AND CARPAL TUNNEL SYNDROME INSTRUMENT (CTSI)

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Objective: The carpal tunnel syndrome instrument (CTSI) has high sensitivity for clinical symptoms of carpal tunnel syndrome (CTS). The atrophy of thenar muscle is often observed in advanced CTS. The aim of this study is to analyze the correlation between thenar muscle thickness by ultrasonographic evaluation and Japanese version of carpal tunnel syndrome instrument (CTSI-JSSH) in CTS patients.

Methods: Forty-five with thenar atrophy due to CTS (13 males and 32 females) with a mean age of 72.8 years (range, 54–88 years) were included in this study. The abductor pollicis brevis (APB) and opponens pollicis (OPP) muscles were evaluated by ultrasonography: The transducer was applied onto the palmer surface of the hand perpendicularly to the longitudinal axis of the first metacarpal bone. Then, both muscles were measured their thickness: the “APB depth” (from the inserted prominence of the OPP muscle above the first metacarpal bone to the palmar surface) and the “OPP depth” (from the ulnar prominence of the first metacarpal bone to the palmar surface of the OPP). Then, the area of both muscles was measured. The correlation between both the thenar muscle depths and CTSI-JSSH score were analyzed by Pearson's correlation coefficient (r).

Results: The correlation between the APB depth and functional score of CTSI-JSSH ($r = -0.20$) was presented. There was a significant negative correlation between the APB depth and functional score of CTSI-JSSH. No significant correlation was observed for other values.

Conclusion: Clinically, muscle atrophy of APB precedes the ones of OPP and brings discomfort in activities of daily living. Our ultrasonographic evaluation of thenar muscle in CTS supported the adverse value to CTSI-JSSH score.

A-0127 SHORT-DURATION VANCOMYCIN SOAKING FOR UPPER-EXTREMITY TENDON AND LIGAMENT RECONSTRUCTION: AN IN-VITRO VALIDATION OF A 5-MINUTE PROTOCOL

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Introduction: Vancomycin soaking of tendon grafts is widely recommended for infection prevention in ligament reconstruction, typically for 10–20 minutes. However, in upper-extremity procedures such as distal biceps, triceps, or coracoclavicular ligament reconstruction, prolonged soaking can increase operative time and risk of complications. A shorter soaking duration may improve surgical efficiency without compromising bacterial eradication.

Aim: To evaluate the efficacy and safety of a 5-minute vancomycin soaking protocol for potential application in upper-extremity tendon and ligament reconstruction.

Material & Methods: Using a validated in-vitro model, human semitendinosus tendons inoculated with *Staphylococcus aureus*, *Staphylococcus epidermidis* (biofilm and non-biofilm strains), and *Enterococcus faecalis* were treated by direct soaking (5 mg/mL) or gauze wrapping (2.5–10 mg/mL) for 5 minutes. Bacterial cultures, tenocyte and HUMSC viability, and vancomycin release profiles were analyzed.

Results: Complete bacterial eradication was achieved with direct soaking at 5 mg/mL and gauze wrapping at 10 mg/mL. Cell viability remained $\geq 70\%$, and vancomycin release (peak 79 $\mu\text{g/mL}$; cumulative 175 $\mu\text{g/mL}$) was well below chondrotoxic levels. No significant cytotoxicity was observed.

Conclusions: A 5-minute vancomycin soaking protocol effectively eliminates bacterial contamination while maintaining graft cell viability and safety. This shortened method offers a practical and biologically safe alternative for upper-extremity ligament reconstruction, minimizing surgical delay associated with traditional 10–20-minute soaking protocols.

A-0129 INSTABILITY OF THE DISTAL RADIOULNAR JOINT IN DIAPHYSEAL FOREARM MALUNIONS TREATED BY 3D-PLANNED OSSEOUS CORRECTION

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Introduction: This study evaluates the effect of a 3D-planned corrective osteotomy using patient-specific drilling and cutting guides in patients with distal radioulnar joint (DRUJ) instability due to diaphyseal forearm malunion sustained in childhood.

Methods: Nine patients (mean age at trauma, 12 years) with malunion and preserved forearm rotation but symptomatic DRUJ instability underwent a corrective osteotomy of the radius and/or ulna. Function and pain were assessed using the Patient-Rated Wrist/Hand Evaluation (PRWHE) score, the Numeric Rating Scale (NRS), and the Patient-Specific Functional Scale (PSFS). Furthermore, baseline clinical assessments were compared with findings at twelve months of follow-up.

Results: At twelve months, all patients demonstrated significant and clinically relevant improvement in function and pain, as well as a stable DRUJ without additional soft-tissue repair. Median PRWHE scores improved from 44.5 to 5.5 ($p = 0.004$). NRS scores improved from 2 to 0 ($p = 0.063$) at rest and from 7 to 1 ($p = 0.016$) during activity. PSFS scores improved from 7 to 2 ($p = 0.01$). All outcomes showed clinically relevant improvements according to the minimal clinically important difference (MCID).

Conclusion: These findings indicate that precision 3D-guided osteotomy can restore DRU joint stability and improve symptoms in patients with a diaphyseal forearm malunion without the need for (additional) soft tissue reconstruction.

A-0130 THE PHALEN-APB TEST: A MOTOR PROVOCATIVE TEST FOR CARPAL TUNNEL SYNDROME

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Introduction: The diagnosis of carpal tunnel syndrome (CTS) depends on physical examination, which may be overlooked in cases of persistent peripheral neuropathy. This study introduces the Phalen-Abductor Pollicis Brevis (APB) test, a novel motor provocative test for the diagnosis of CTS.

Aim: The purpose of this study was to compare the diagnostic accuracy of the Phalen-APB test with established CTS diagnostic tests.

Material & Methods: A prospective study included patients presenting with hand numbness, and electrodiagnostic studies confirmed CTS. Participants underwent standard provocative tests, including the modified Phalen's test, Durkan test, and the motor provocative Phalen-APB test. The Phalen-APB test evaluates APB muscle strength before and after 60 seconds of wrist flexion, with a positive result defined as decreased APB strength, graded by examination (Gr, grade 0–V) and by dynamometer (N, Newton). Diagnostic accuracy was analyzed using sensitivity, specificity, and area under the curve (AUC) metrics.

Results: Among 80 patients (130 hands), 89% were confirmed to have CTS, with 24% reporting persistent hand numbness. The average age was 60.9 years, with a female-to-male ratio of 4:1; obesity, diabetes mellitus, and thyroid disorder were present in 20%, 30%, and 12.5% of the patients, respectively. Sensitivity and specificity were as follows: modified Phalen's test (49%, 92%), Durkan test (41%, 86%), Phalen-APB test (Gr) (50%, 93%), and Phalen-APB test (N) (68%, 71%). In cases with persistent numbness, the Phalen-APB test (Gr) and (N) decreased by more than 3 demonstrated higher sensitivities (57% and 64%) than the modified Phalen's (39%) and Durkan tests (43%). AUC analysis indicated superior diagnostic accuracy for the Phalen-APB test (Gr: 0.71; N: 0.70) to conventional tests.

Conclusions: The Phalen-APB test demonstrates enhanced diagnostic sensitivity for CTS, particularly in patients with persistent numbness, outperforming traditional tests such as the modified Phalen's and Durkan tests.

A-0131 SURGICAL STRATEGIES FOR PAINFUL END NEUROMAS OF THE HAND

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Introduction: Painful sensory neuromas of the hand present a significant clinical challenge, with management often complicated by inconsistent outcomes and a lack of consensus regarding optimal surgical strategy. Given the functional importance of the hand and the severe impact of neuroma-related pain on daily activities, identifying effective interventions is critical to restoring quality of life and occupational ability. We performed a systematic review to evaluate the reported clinical outcomes of defined surgical strategies and identify evidence gaps.

Aim: To evaluate and compare the reported outcomes of surgical treatments for painful sensory end neuromas of the hand, providing an evidence-based framework to guide clinical decision-making.

Material & Methods: A PRISMA-compliant systematic review was registered with PROSPERO (CRD420251133868). PubMed, Ovid Medline, Embase, Scopus, and the Cochrane Library were searched to 1st August 2025. Eligible studies reported outcomes of surgical treatment for symptomatic end neuromas of the hand, without distal reconstruction. Pain reduction was the primary endpoint; functional outcomes and neuroma recurrence were secondary. Data were pooled using a random-effects meta-analysis with subgroup analyses by technique.

Results: Fifteen studies (431 patients, 655 neuromas) were included, the majority being retrospective (Level IV–VI evidence). Neuroma excision alone provided the least effective pain relief (41–65%) and the highest recurrence rates. Relocation techniques showed highly variable outcomes (14–96%), influenced by the choice of target tissue. Nerve capping achieved 41–81% pain reduction with early silicone devices, improving to 78% with newer bioresorbable co-polyester caps. Centro-central neurorrhaphy and epineural ligation reported >90% pain reduction, though findings were limited to small case series. Regenerative peripheral nerve interface (RPNI) reported 85% improvement in a single study. Reporting of functional outcomes was inconsistent; however the few studies using validated PROMs (DASH/QuickDASH) showed measurable post-operative improvement.

Conclusions: Surgical management reliably reduces pain in patients with end neuromas of the hand, but current evidence does not support one definitive technique. Excision alone should no longer be considered an acceptable primary strategy. Advancement in care will depend on prospective multicentre studies using standardised, validated PROMs, and on translational approaches that target the underlying biology of neuroma formation.

A-0134 UNDERSTANDING ULNAR WRIST PAIN: A CROSS-SECTIONAL ANALYSIS OF CLINICAL AND RADIOLOGICAL MARKERS

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Introduction: Ulnar-sided wrist pain is an increasingly common reason for patient consultations and often presents a diagnostic challenge for clinicians. Among the most common causes of such discomfort are: triangular fibrocartilage complex (TFCC) injuries, distal radioulnar joint (DRUJ) instability, extensor carpi ulnaris (ECU) tendinopathy, ulnar impaction/impingement syndrome, DRUJ-region ganglia, and overuse syndromes.

Aim: The aim of this study is to examine the correlation between clinical symptoms and imaging findings in patients presenting with ulnar-sided wrist pain, and to identify the most frequent underlying causes of symptoms in the studied group.

Material & Methods: The study included 92 patients, evaluating history-taking, clinical tests, ulnar variance on X-ray, abnormalities on MRI or ultrasound, time since potential injury, and the type of treatment (conservative or surgical).

Results: The majority of patients were female (56 women, 36 men; mean age: 41.1 years). In 63 patients, symptoms began following an injury (mean time since trauma: 259 days). The most frequently observed positive clinical signs were: fovea sign (77), ulnar grind test (71), and piano key test (63). MRI was performed in 68 patients, with TFCC pathology identified in 56 of them. On conventional wrist X-rays, 39 patients had a positive ulnar variance, 18 negative, and 35 neutral. Dominant limb involvement was reported by 44 patients.

Positive ulnar variance showed a statistically significant correlation with ulnar-sided wrist pain and TFCC injury ($p = 0.032$). Degenerative changes were more common in older patients ($p = 0.004$) and correlated with the time elapsed since injury ($p = 0.03$). Age and sex did not directly influence the incidence of TFCC damage. Among clinical tests, the DRUJ instability test—piano key test—showed the highest sensitivity (82.8%) and correlation with TFCC injuries ($p = 0.0012$).

Conclusions: Accompanying degenerative changes—such as DRUJ degeneration and calcifications near the TFCC—are more common in older patients. Age and sex do not directly influence the occurrence of TFCC injuries, but positive ulnar variance does. Among clinical assessments, the piano key test for DRUJ instability demonstrates the highest sensitivity and correlation with TFCC injuries.

This study serves as a reference point for clinicians and suggests that, when interpreting X-ray and MRI results, ulnar variance, clinical history, and physical examination should be carefully assessed for accurate diagnosis of ulnar-sided wrist pain.

A-0135 THE ROLE OF M1/M2 RATIO IN FUNCTIONAL OUTCOMES AND COMPLICATIONS FOLLOWING TRAPEZIOMETACARPAL ARTHROPLASTY: A RETROSPECTIVE STUDY OF 187 CASES

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Introduction: Restoration of thumb length is of the main goals of trapeziometacarpal (CMC) arthroplasty; however, the influence of length variation on function is still uncertain.

Aim: To evaluate the correlation between changes in the M1/M2 ratio (first-to-second metacarpal ratio) before and after CMC arthroplasty and their relationship with functional outcomes and complications.

Material & Methods: A retrospective observational study was conducted on patients who underwent CMC arthroplasty (Maia-Lépine), from 2015 to 2023 at a single institution. Functional outcomes were assessed using the QuickDASH questionnaire, the Visual Analog Scale (VAS) for pain, thumb abduction angle, and Kapandji opposition scale. Radiographic measurements of M1/M2 ratio were performed pre- and postoperatively by two independent observers. Inter-rater reliability was assessed by calculating the intraclass correlation coefficient (ICC). Statistical analyses assessed the influence of M1/M2 ratio on patient outcomes and complications.

Results: A total of 187 cases of CMC arthroplasty with a mean follow-up of 3.4 years (minimum of one year) were included. Women represented 79.1% of the patients, with a mean age of 60.2 ± 7.8 years. Complications occurred in 9.6% of cases, with 6 cases classified as major and requiring re-intervention. Implant survival was 97.8% at 12 months and 96.4% at 3 years.

Radiographic analysis showed a median preoperative M1/M2 ratio of $0.71 (\pm 0.03)$, and a postoperative ratio of $0.79 (\pm 0.03)$, with a mean change of $0.08 (\pm 0.03)$. A significant correlation was found between larger changes in M1/M2 ratio and worse QuickDASH score ($p = 0.024$). Patients with major complications demonstrated higher median postoperative M1/M2 ratio (0.83) compared to those without complications (0.79 , $p = 0.04$). No significant correlation was found between postoperative pain and the M1/M2 ratio.

Conclusions: While restoration of thumb length is important in CMC arthroplasty, excessive changes in the M1/M2 ratio were associated with poorer functional outcomes. Elevated postoperative M1/M2 ratios correlated with an increased risk of major complications, suggesting that maintaining an optimal M1/M2 ratio is critical for favorable surgical outcomes.

A-0136 PROSPECTIVE 2 YEAR RESULTS OF 42 CASES OF MOTEC TOTAL WRIST IMPLANT ARTHROPLASTY: OUTCOMES & COMPLICATIONS

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Introduction: Total Wrist Implant Arthroplasty (TWIA) is still comparatively rarely performed compared to Partial- (PWF) or Total Wrist Fusion (TWF) and thus large scale prospective studies of outcomes (especially in young and active patients) are still lacking. New generation Implants have been shown to also work in high demand Patients, prompting an increase in interest in these implants by the hand surgery community.

Aim: Evaluation of short term outcomes and complications after TWIA in posttraumatic and idiopathic cases of wrist osteoarthritis

Material & Methods: An analysis of our in-house hand implant register will be performed and statistically evaluated at 31.05.2026 including all patients with a follow-up of at least 2 years after TWIA. All patients are evaluated preoperatively as well as at 6 weeks, 3 and 6 month and 1 and 2 years after operation regarding Range of Motion (ROM), Grip strength and subjective Patient Reported Outcome Measures (PROMS) including PRHWE and DASH scores.

Results: At current planning, the analysis will include 42 patients with a median age of 56 (24-80) years at implantation. A provisional analysis of the cohort at 1 year postoperative revealed a significant improvement in Range of motion of the affected wrist. Grip strength did not differ from preoperative values. Pain at rest and at maximum as well as PRHWE and DASH did diminish slightly, but not significantly.

There was no significant difference for all parameters between blue- and white collar workers. At 1 year there was no difference in parameters between 20 year age strata.

There were 13 complications requiring surgical revision, 3 of which required exchange of the distal stem for loosening (partial loss) and one explantation of the TWIA (total loss) for hematogenous infection after septicemia caused by an infected vascular bypass.

Complication rates between blue- and white collar workers did not differ significantly.

Conclusion: TWIA is a valid option for high demand patients with wrist OA who want to preserve wrist motion and are willing to accept the possible risks associated with the procedure. Long term data however is still lacking for larger cohorts. Thus implantation (especially in demanding patient populations) should be performed in a study setting, to better work out the long term outcomes, risks and complications.

A-0137 COMPARISON OF PARALLEL VS ORTHOGONAL PLATING FOR CORONAL SHEAR FRACTURES OF THE DISTAL HUMERUS; A-CADAVERIC STUDY

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Introduction: Treatment remains a challenge for type C3 distal humerus fractures (AO classification) when there is also a coronal shear fracture. In general, orthopedic surgeons tend to favor orthogonal plating for coronal shear fractures. However, there is no consensus on whether parallel or orthogonal plating is the most effective method of fixation for these shear fractures.

Aim: We hypothesized that in distal humerus fractures with a coronal shear fragment, parallel plating would provide more rigid fixation and less fragment motion than that seen with orthogonal plating.

Material & Methods: 8 matched pairs (16 elbows) of cadaveric elbows were used. We removed all muscles and capsule but preserve both collateral ligaments. Identical C3 distal humerus fracture patterns were created using a 3D-printed cutting guide to maintain osteotomy consistency. Each specimen-specific 3D digital mesh model was aligned with the matching physical specimen using 3D camera system and fiducial markers so that optical metrology could be performed. The distal humerus fractures were repaired using an orthogonal plating on one humerus and a parallel plating on the contralateral side using Acumed Congruent Elbow Plating System. Right and left humeri were randomized for each plating construct. The displacement and rotation of each fragment was measured with the optical metrology system under 10 cycles axial loading at 100, 200 and 300N sequentially using a material testing loading frame. Translation data were captured in the anterior-posterior (x), proximal-distal (y), medial-lateral (z) axes. Rotation about each of these 3 axes were also captured: varus-valgus (x), internal-external (y) and flexion-extension (z) (Figure 1). Data were analyzed using two-factor repeated-measures analysis of variance.

Results: The average age of the specimens was 86 (83-96) years, 4 male and 4 females. In resisting the proximal (y-axis) translation of the coronal shear fragment, parallel plating was significantly better than orthogonal plating at 300N (*p<0.05, Figure 2). In resisting valgus (x-axis) rotation, parallel plating was significantly superior to orthogonal plating in all loading forces tested (p<0.05). In resisting proximal translation of the posterolateral fragment, parallel plating was significantly superior to orthogonal plating in all loading forces tested (p<0.05). We didn't find any specimens that showed translation greater than 2mm or rotation greater than 8 degrees under these cyclic loads, which we defined as gross failure. Conclusions: Our findings indicate that parallel plating is more rigid overall than orthogonal plating for the fixation of distal humerus fractures with a coronal shear fragment. This was especially true for stabilizing the coronal shear fragment itself.

A-0138 CONSERVATIVE OPERATIONS FOR METASTATIC LESIONS OF THE LONG BONES OF THE UPPER EXTREMITY

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Introduction: Bone metastases cause pain, pathological fractures, spinal cord or nerve root compression, and life-threatening hypercalcemia, and may require surgery, radiation therapy, or medical treatment. The choice of surgical treatment for patients with metastatic bone tumors can be vital in terms of patient survival, quality of life, and postoperative limb function.

Aim: Evaluation of the effectiveness of conservation operations for metastatic lesions of the long bones of the upper limb.

Material & Methods: From 2019 to 2024 26 patients with metastatic lesions of the long bones of the upper limb were under our supervision. There were 14 men, 12 women. The average age of the patients was 59.8 years. According to the localization of the primary source of the metastatic tumor, the following were found: kidney cancer - 10 patients, breast cancer - 7, lung cancer - 5, multiple myeloma - 3, rectal cancer - 1. Reinforced osteosynthesis using bone cement was used in 10 (38.5%) patients, transosseous osteosynthesis using Kostyuk external fixation devices – 6 (23.0%), endoprosthesis of the elbow joint using individual oncological endoprostheses – 4 (15.4%), endoprosthetics of the shoulder joint – 4 (15.4%), endoprosthetics of the diaphysis of the humerus – 2 (7.7%). Patients received courses of pre- and postoperative radiation therapy, intravenous polychemotherapy, hormone therapy, immunotherapy and bisphosphonates in the schemes of complex therapy of this pathology. Limb function was determined using the MSTs system. The degree of pain syndrome was determined according to the scale of Watkins R.G. Quality of life was determined according to the EORTC QLQ-30 questionnaire. Patient survival was calculated using the Kaplan-Meier method.

Results: As a result of the treatment, postoperative complications were revealed in 1 (3.8%) patient, tumor relapses in 2 (7.7%) patients, new foci of metastatic lesions in the bones of the skeleton in 13 (50.0%) patients. Function of the upper limb (according to the MSTs system): after using the external fixation device – 66%, reinforced osteosynthesis – 70%, shoulder joint endoprosthesis – 68%, elbow joint endoprosthesis – 76%, humerus diaphysis endoprosthesis – 82%. The degree of pain syndrome (according to the Watkins R.G. scale): after the use of external fixation devices decreased from 90 to 20%, after reinforced osteosynthesis from 67 to 33%, after endoprosthesis from 88 to 35%. The quality of life of patients improved from 40 to 80 points. The three-year survival rate of patients was $32.6 \pm 7.6\%$.

Conclusions: Performing conservative operations for metastatic lesions of the long bones of the upper extremity in the schemes of complex treatment allows to restore the function of the extremity, reduce the pain syndrome and therefore improve the quality of life of patients.

A-0139 COMPREHENSIVE TREATMENT OF FOREARM BONE TUMORS

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Introduction: According to the literature, malignant tumors of the forearm bones account for 1–2% of all primary malignant bone tumors. Surgical treatment of tumors of the forearm bones is more complicated compared to tumors of bones of other localizations due to the location of muscles and tendons, nervous and vascular structures of the forearm, which ultimately leads to a significant decrease in the function of the upper limb after tumor removal.

Aim: To show the effectiveness of complex treatment of locally aggressive and malignant tumors of the forearm bones.

Material & Methods: 27 patients with forearm bone tumors were treated. There were 17 patients with a tumor of the radial bone, 10 with a tumor of the ulna. Morphologically met: giant cell tumor – 16, osteogenic sarcoma – 2, metastatic tumors – 2, chondrosarcoma – 1, lymphosarcoma – 1, undifferentiated pleomorphic sarcoma – 1, malignant giant cell tumor – 1, Ewing sarcoma – 1, fibrosarcoma – 1, plasmacytoma – 1. The following organ-preserving operations were applied: autoplasty of the bone defect with the fibula bone with metal osteosynthesis – 12, without replacement of the bone defect – 5, endoprosthesis of the elbow joint – 4, reinforced metal osteosynthesis – 2, alloplasty and plastic with ceramic material based on bioactive glass – 1, autoplasty – 1. Chemotherapy and Radiation therapy was performed on patients with osteogenic sarcoma, Ewing sarcoma, malignant giant cell tumor, lymphosarcoma, and solitary plasmacytoma. The functional outcome of the operated limb was determined using the MSTs (Musculo-Skeletal Tumor Staging /System/) scale. The quality of life of patients was determined in points according to the EORTC QLQ-C30 questionnaire. Overall and recurrence-free survival of patients was determined using the Kaplan–Meier method.

Results: Postoperative complications were observed in 3 (11.1%) patients, tumor recurrence – 3 (11.1%), metastases – 2 (7.4%). Functional indicators of the upper limb in operated patients (according to the MSTs scale) were: from 74.8 to 98.4%. The quality of life of patients (according to the EORTC-QLQ-C30 questionnaire) increased from 39 points at the beginning of combined or complex treatment, to 84 points after treatment. The indicators of three-year overall survival of patients were – $82.4 \pm 7.6\%$, three-year recurrence-free survival – $76.6 \pm 8.5\%$.

Conclusions: For malignant tumors of the bones of the forearm, complex treatment is necessary: preoperative and postoperative intravenous polychemotherapy, surgical treatment, and in some cases, radiation therapy.

Tumor recurrence is associated with inadequate tumor response to preoperative courses of polychemotherapy and radiation therapy, as well as with non-radical removal (non-observance of surgical tumor margins during bone resection) of the tumor. Distant metastases are a consequence of tumor recurrence after complex and combined treatment and are a poor prognostic factor for patient survival.

A-0140 SUTURE TECHNIQUES FOR ZONE 2 FLEXOR TENDON REPAIR IN UK SURGEONS

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Introduction: Zone 2 flexor tendon repairs require precise techniques to balance repair strength and preserve gliding. Despite the numerous publications on flexor tendon repair techniques, there is no one "gold standard".

Aim: The aim of this study was to determine which aspects of flexor tendon repair were common practice amongst UK surgeons and the reasons that influenced these practices.

Material & Methods: An online survey was distributed to plastic and orthopaedic surgeons in the UK for anonymous completion. Inclusion criteria were UK surgeons who perform zone 2 flexor tendon repairs of the hand. Data was collected between December 2023 to May 2024. The survey was designed using SurveyMonkey® and all data analysis was completed on this platform.

Results: Of 133 respondents, 119 (89%) were plastic surgeons and 14 (11%) were orthopaedic surgeons. Forty-four percent (44%) were consultants and 56% were registrars. The preferred order of tendon repair was back wall, core suture, then front wall in 69% of the respondents. Sixty percent (60%) favoured a Silfverskiöld suture for the front wall while 70% used a simple running for the back wall. Eighty percent (80%) use a 4-stranded technique for their core suture, with the

preferred core suture techniques being Adelaide (44%) and cruciate (35%). Eighty-three percent (83%) use polypropylene 3/0 with a round bodied needle for the core suture; however, 63% of orthopaedic hand surgeons favoured a braided polyester suture. Polypropylene 5/0 with a round-bodied needle was the preferred epitendinous suture material. Conclusions: This study demonstrates there are commonalities in UK surgeons' practices despite no prescribed guideline. Repair sequences and core suture configuration varied the most; however, most still favoured a 4-stranded technique - consistent with current evidence supporting their strength and reliability. UK practice has evolved over time and is comparable to change seen in other countries.

A-0141 MODIFIED ARTHROSCOPIC SINGLE COMBINED FOVEAL AND PERIPHERAL SUTURE FOR ATZEI'S CLASS 2 AND 3 TFCC TEAR: SURGICAL TECHNIQUE AND PRELIMINARY RESULTS

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Introduction: TFCC injuries, especially those involving the foveal insertion, can lead to significant ulnar-sided wrist pain and loss of wrist function.. Arthroscopy is the preferred method to address the peripheral and/or foveal attachment. **Aim:** This study describes an arthroscopic repair technique that addresses both the foveal and peripheral TFCC tears in a single combined suture, potentially enhancing the stability of TFCC fixation and overall DRUJ stability.

Material & Methods: TechniquernInstability of the DRUJ is confirmed with the ballottement test, revealing significant instability without endpoints. The 3–4, 6R, dorsal DRUJ, and direct foveal portals are used. This technique is indicated for Atzei's class 2 and 3 TFCC tears. The foveal detachment from its footprint to the ulna is confirmed through DRUJ assessment. The undersurface of the disc and foveal footprint are thoroughly debrided to enhance inflammatory fibrosis. An anchor is inserted from the direct foveal portal to the foveal footprint. The outside-in method is used to attach the TFCC to the anchor. The threads are firmly secured through the 6R portal, compressing the TFCC against the foveal footprint. The tails of the threads are not cut. The volar and dorsal radioulnar ligament, are then capture with the same threads that are secured "around the styloid" with the knot pushed against the peripheral capsule in the direct foveal portal. The ulnar peripheral border of the TFCC is now also re-stabilized and the DRUJ ballottement stability is additionally restored. Below-elbow immobilization is maintained for 4 weeks, after which physiotherapy is restarted.

Results: 13 patients were included. Mean age was 43 years (25–61), time between onset symptoms and surgery 12 months (2–36), mean follow-up 12 months (6–18). Significance level set on $p < 0,05$.

Pain VAS reduced significantly by 72%, grip strength increased significantly by 58% compared to preoperative status. Total flexion-extension range, pronation and supination was not significantly different from the contralateral side. Activities were able to be restarted after 4,5 months (3–6).

Conclusions: Recent evidence suggests that the foveal insertion is quite broad, prompting techniques that incorporate four fixation points in the TFCC rather than the traditional two. This modification requires four piercing points in the TFCC, with an additional extraarticular knot "around the styloid" that primarily fixes the peripheral border of the TFCC to the capsule. It may enhance the stability of TFCC fixation and overall DRUJ stability, potentially reducing the need for strict postoperative immobilization that excludes forearm rotation. Long-term prospective trials are necessary to evaluate whether this modification provides additional stabilization for the TFCC and DRUJ without increasing stiffness compared to the conventional suture anchor technique.

A-0142 IMPROVED SUBJECTIVE OUTCOMES IN OPERATED BUT NOT IN CONSERVATIVELY TREATED SUPERELDERLY (>80 YEARS) PATIENTS WITH A DISTAL RADIUS FRACTURE (DRF). A PROSPECTIVE AND CONSECUTIVE REGISTER STUDY FROM 2003 TO 2018

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Introduction: With new national guidelines in Sweden 2021, age as a selection factor for surgical treatment was abandoned and replaced by the patient's need of a well functioning wrist and the ability to undergo surgery and rehabilitation.

Aim: More healthy and independent superelderly will therefore undergo surgery, but what were the results in this high age group before the guideline change?

Material & Methods: Since 2002, all DRF-patients at our hospital, 18 years and older, are prospectively registered. Patient-reported outcomes are collected at 1 year using DASH. Between 2003 and 2018, 5077 patients, 18 years or older were treated for a DRF. 1088 were older than 80 years (median 85, range 80-97, 133 men/955 women).

Results: 617/1088 of the 80+ patients had returned a valid DASH score at one year. In all patients 80+, the mean DASH at one year was 29 (SD 24) and median 23 (range 0-100) with no trends of improvement over the years from 2002-2018. With increasing age, the subjective outcomes worsened.

51 underwent surgery (13 ex fix, 1 K-wires, 5 fragment-specific fixation (FSF), 32 volar locking plate (VLP). For the operated, the mean DASH was 28 and the median 23. Operated patients with AO type A fracture had better DASH at one year compared to AO type C (median 18 vs 36). Patients treated with VLP had better outcome (median DASH 12) compared to FSF (median DASH 42) and ex fix (median DASH 43). External fixators were predominantly used in the early period, whereas the VLPs became more common in later years.

Conclusions: - The subjective outcome in conservatively treated superelderly patients has remained largely unchanged over the years

- The subjective outcome in surgically treated superelderly patients has significantly improved since the early 2000s, likely due to advancements in fixation techniques (VLPs vs external fixators).

- The outcomes of surgically treated patients > 80 years in recent years are comparable to the median DASH score in the adult DRF population (Landgren 2017).

A-0143 CORRELATION ANALYSIS BETWEEN THE ARTHROSCOPIC EWAS CLASSIFICATION SUBGRADING AND RADIOLOGICAL & MRI IMAGING FOR DYNAMIC SCAPHOLUNATE INSTABILITY

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Introduction: Scapholunate instability can result in pain and dysfunction. Diagnosing remains a complex task. Radiological views and MRI are commonly used to confirm clinical suspicion. Wrist arthroscopy is considered the gold standard to assess extent of the instability. This study aimed to evaluate the relationship between these imaging measurements and the arthroscopic European Wrist Arthroscopy Society (EWAS) subgrades. The goal is to enable accurate predictions of instability degrees using non-invasive radiologic methods.

Material and Methods: All 133 included participants underwent arthroscopic EWAS grading performed by the primary author. Two independent observers retrospectively assessed the preoperative radiographs and MRI scans, separate

from the primary author and each other. Measurements included scapholunate distance (SLD) on unloaded and stress posteroanterior views, and scapholunate angle (SLA), radiolunate angle (RLA), and capitulunate angle (CLA) on lateral views. MRI evaluations assessed the presence of scapholunate tears or cysts, bone edema, capsular synovitis, dorsoradial capsular distention and dorsal scaphoid translation. Interobserver reliability, the correlation of radiographic and MRI findings with wrist arthroscopic assessments, and the predictive value of radiographs and MRI regarding EWAS grading were analyzed.

Results: The interobserver reliability for SLD on stress radiographs was good (0.75, 95% CI = 0.68–0.82), while reliability for other radiographic measurements ranged from 0.50 to 0.75. All MRI measurements showed interobserver reliability of less than 0.50, indicating poor agreement and interpretive complexities. The EWAS grading demonstrated significant associations with SLD on unloaded radiographs ($p < 0.0001$), SLD on stress radiographs ($p < 0.0001$), and SLA ($p < 0.0001$). In EWAS grades 2 to 3, the mean SLD was under 2.5 mm for both unloaded and stress radiographs, and the mean SLA was less than 60°. Increased mean values for SLD on unloaded (3.2 mm, 95% CI = 2.9 – 3.6 mm) and stress radiographs (4.2 mm, 95% CI = 3.8 – 4.6 mm), as well as for SLA (64°, 95% CI = 60 – 67°), were noted only in EWAS grades 4/5. On MRI, EWAS grading was significantly associated with the presence of dorsal ligament tears or cysts ($p < 0.0003$). A dorsal tear or cyst indicated a low probability (probability < 0.5) in EWAS grades 2 to 3, whereas the probability increased to over 0.6 in EWAS grade 4/5. Similarly, the presence of a volar tear or cyst was less likely (probability < 0.5) in EWAS grades 2 and 3b, but its probability rose above 0.6 in grades 3a, 3c, and 4/5. The evaluated radiographic and MRI measurements showed limited predictive value of only 40% for the correct EWAS grading.

Conclusion: This study highlights that the various arthroscopic subdegrees of scapholunate instability are not typically identifiable through plain radiographs or MRI. While these imaging techniques serve as valuable supplementary investigations, wrist arthroscopy remains the gold standard for diagnosis.

A-0144 ENCASED IN GRAINS- A DIAGNOSTIC CHALLENGE OF CHRONIC WRIST SWELLING

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Introduction: Tuberculous tenosynovitis (TB tenosynovitis) is a rare extrapulmonary manifestation of *Mycobacterium tuberculosis* (*M. tuberculosis*) that presents a significant diagnostic challenge due to its indolent presentation and resemblance to inflammatory arthritis.

Aim: This case study aims to elucidate the diagnostic dilemma associated with chronic wrist swelling and underscores the crucial role of imaging and histopathological examination in confirming the diagnosis.

Materials and Methods: A 36-year-old male patient with a history of retroviral positivity and cervical TB lymphadenitis presented with a one-year history of painless swelling on the wrist and palm, which progressively increased in size. Additionally, he experienced numbness in his fingers and limited flexion. Clinically, a soft, doughy, poorly defined swelling was observed over the volar aspect of the wrist and palm, accompanied by reduced sensation over the median nerve distribution.

Results: Magnetic resonance imaging (MRI) revealed extensive rice body formation within the carpal tunnel, encapsulating the flexor pollicis longus (FPL) and flexor digitorum tendons. Subsequently, an excision biopsy with extensive synovectomy was performed through a volar incision. Intraoperatively, well-encapsulated masses engulfing the tendons of FPL, FDP, and FDS were noted. The mass contained multiple rice bodies. Histopathology showed fibro collagenous tissue with cystic-like lesions composed of multiple foci of granuloma formation, which is characteristic of chronic granulomatous inflammation.

Polymerase chain reaction (PCR) analysis of the tissue confirmed the presence of *Mycobacterium tuberculosis* DNA, leading to a definitive diagnosis. The patient was subsequently initiated on a comprehensive course of anti-tuberculous therapy, and there was no recurrence of swelling observed during follow-up.

Conclusions: Chronic wrist swelling can present a diagnostic conundrum. Tuberculous tenosynovitis can be a probable differential diagnosis, particularly in immunocompromised individuals and endemic regions.

A-0145 THE DIAMOND CONCEPT FOR PERIPHERAL NERVE REGENERATION - WHY SHOULD WE THINK ABOUT IT, AND HOW CAN WE USE IT?

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Introduction: Achieving a functional result after peripheral nerve repair or reconstruction with grafts or other techniques, including nerve transfers, remains a very challenging topic, and, according to different authors, recovery varies between 51% and 70% of the function in the hand/foot/limb before the injury. Every year, scientists develop new technologies that can help achieve good functional outcomes. Still, each technology has pros and cons, which is why the latest experimental methods rarely reach all groups of injured patients. Clinical implementation of some basic science achievements may be difficult, expensive, and hardware-demanding for various reasons. Meta-analyses of the literature and some extensive studies may provide clinicians with debatable information about the functional outcomes of implementing these technologies or surgical techniques. In our opinion, understanding the entire process of nerve regeneration, including its influencing factors, can give the surgeon a sense of which technology and/or surgical technique may be the optimal treatment for each unique patient.

Aim: To present our thoughts and vision on the factors that can influence peripheral nerve regeneration, and to initiate discussion among specialists to crystallise the concept.

Discussion: "The Diamond concept of bone healing" is a conceptual framework of the essential factors for successful bone healing, and it helps orthopaedic surgeons assess and plan the management of fracture nonunions. In the same way, the factors that influence peripheral nerve regeneration: e.g., growth and other essential factors, Schwann cells and macrophages, nerve scaffolds (a group of sural nerve grafts, or nerve allograft), quality of nerve connection (nerve suture, fibrin glue or nerve tape), adequate vascularity of the surrounding tissue, the nerve graft(s) or the nerve ends, condition of the target muscles or the innervation area, and patient comorbidities (e.g., diabetes, hormonal disorders, smoking) – can be organized as "The Diamond concept of nerve regeneration".

For example, the standard nerve conduit may be sufficient in a case of a minor sensory nerve defect with good vascularity of the surrounding tissues. In case of significant mixed nerve defects, using graft(s) with a scaffold and relevant nerve trunk cells to support the nerve regeneration is a better alternative. Suppose a major mixed nerve defect is surrounded by scar tissue. In that case, the nerve surgeon should consider reconstructing a gliding system with optimal nerve vascularity, which may require additional techniques, e.g., a nerve transfer or flap coverage.

Conclusions: Implementation of "the Diamond concept for peripheral nerve regeneration" can facilitate understanding of clinical requirements for better functional outcomes after nerve repair or reconstruction, and determine which technology and surgical technique are ideal for a particular case.

A-0146 FUNCTIONAL NEUROLOGICAL DISORDERS OF THE HAND: PREDISPOSING AND PERPETUATING FACTORS IN A SERIES OF 13 PATIENTS

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Introduction: Functional neurological disorders (FND) of the hand present a major diagnostic and therapeutic challenge at the crossroads of neurology, psychiatry, and hand surgery. They are characterized by non-organic movement impairment, often with dystonic posturing or digital immobility.

Aim: This study aimed to describe the clinical and psychosocial characteristics of patients with hand FND and to identify factors contributing to symptom onset and persistence.

Material & Methods: A retrospective, single-centre review of 13 patients diagnosed with hand FND was conducted. Demographic data, clinical presentation, psychiatric comorbidities, and relevant life events were collected. The relationship between symptom onset, preceding trauma, and psychosocial factors was explored, along with surgical history and treatment outcomes.

Results: The cohort included 11 women and 2 men (mean age 45 years). Seven patients had known psychiatric comorbidities. All reported a prior traumatic event involving the upper limb as a triggering factor. Digital immobility and functional exclusion of the limb were universal findings. Spontaneous neuropathic pain occurred in 8 cases. Among patients previously operated on, 8 described a negative experience related to regional anaesthesia and/or conflict with the surgeon. Half underwent examination and mobilization under anaesthesia without improvement in range of motion. One patient required transhumeral amputation for a painful, non-functional, excluded limb. All received multidisciplinary management including rehabilitation, pain medicine, psychiatry, and orthopaedic follow-up.

Conclusions: The clinical presentation was consistent with the “psychoflexed hand” described in previous reports. Spontaneous pain, low socio-educational background, and significant secondary gain appear to constitute adverse prognostic factors. We contend that certain long-standing dogmas within the surgical community—such as the principle of surgical abstention and the practice of withholding the diagnosis from the patient—merit critical re-evaluation. Early recognition of psychological and iatrogenic factors may help prevent this disabling functional disorder of the hand.

A-0147 WHICH MATTERS MORE RISK OR PROTECTIVE FACTORS? - A STUDY USING THE PASTPANE PROGNOSTIC SCREEN

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Introduction: Multiple psychological factors have been proposed to influence pain and disability in musculoskeletal disorders. To date, the literature primarily focuses on negative psychological factors, rather than positive psychological factors.

Aim: The overall objective of this paper was to better understand the positive screening rates and relative importance of specific positive and negative psychological factors as determinants of pain and function/disability, reported by patients presenting for care of upper extremity musculoskeletal problems. The specific purposes were:

1. Which positive and negative factors are screened in for men and women?

2. Which positive and negative factors are associated with upper extremity pain and function/disability? Does this vary by sex?
3. What is the relative contribution of age, sex, the positive and negative psychological subscale scores on patient reported pain and function/disability?

Material & Methods: This was a single-center retrospective cohort design from a single upper extremity clinic. Patients who were over the age of 18 years old, able to read and write English, completed a set of baseline PROMs between July 4th, 2022 – June 17th, 2024, and willing to provide informed consent were included. Patients completed The Psychological and Social Traits-Positive and Negative Elements (PAST-PANE, 13 negative items and nine positive items), numeric pain ratings, a global function/disability (SANE) and a joint-specific PROM (hand/wrist, elbow or shoulder). Pearson correlation and backwards multivariate linear regression analysis described associations.

Results: Correlations between individual psychological factors and pain were low to moderate (0.07-0.54), negligible to low with the SANE (-0.04 to -0.28), and negligible to moderate with specific disability PROM (0.03 to -0.43) for overall patients. Negative factors that were most influential ($r \geq 0.40$) were XX, positive were XX). Sex ($R^2 = 0.26$) had the largest effect on Upper Extremity Pain, and the positive and negative psychological scores ($R^2 = 0.07$) had the largest effect on SANE scores, while age had the largest effect on Upper Extremity Function ($R^2 = 0.21$).

Conclusions: Both positive and negative psychological factors should be measured and considered as prognostic in clinical assessment and research.

A-0148 IS THERE AN INDICATION FOR SURGICAL MANAGEMENT OF PALMAR PLATE INJURIES? A NEW TREATMENT CONCEPT

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Introduction: Isolated ruptures of the palmar plate at the interphalangeal (IP) and metacarpophalangeal (MCP) joints are generally treated conservatively. However, some fail to heal properly, leading to joint instability, often resulting in a swan-neck deformity with hyperextension, pain, and functional impairment. There are currently no reliable criteria to identify which lesions will progress to such instability. If recognized early, surgical treatment can restore joint stability and promote proper healing, preventing long-term consequences.

This study proposes a hypothesis regarding the etiology and subgroup prone to chronic instability and evaluates the outcomes of surgical palmar plate refixation in a respective case series.

Aim: To identify a subgroup of isolated palmar plate injuries at risk of developing chronic instability and to evaluate their clinical and functional outcomes after surgical refixation.

Material & Methods: We retrospectively reviewed 12 patients (10 male, 2 female; mean age 40.2 years) operated between 2009 and 2024 for isolated palmar plate ruptures with confirmed proximal flipping of the plate on ultrasound. Three were acute (< 4 weeks), three subacute (1–3 months), and six chronic (> 3 months). Several patients presented a reducible swan-neck deformity. Lesions involved seven cases at the PIP joint of the fifth finger, two at the PIP of the fourth finger, two at the IP joint of the thumb, and one at the MCP joint of the thumb.

Surgery consisted of direct refixation using V-shaped bone tunnels ($n = 11$) or a Juggernaut all-suture anchor ($n = 1$). Pain, hyperextension, and flexion mobility were assessed preoperatively and at final follow-up using standard goniometric measurements.

Results: The Wilcoxon signed-rank test showed a significant reduction in hyperextension ($p = 0.0015$), from a mean of

28° preoperatively to 4° postoperatively. Flexion significantly improved ($p = 0.0015$), from 20° to 71°. All patients who reported preoperative pain were pain-free at the last follow-up.

Conclusions: In palmar plate injuries with proximal flipping, the ligament complex remains trapped in a non-anatomical position beneath the flexor tendons, preventing spontaneous relocation and proper healing under conservative management. These avulsion-type lesions tend to progress to chronic instability with functional limitation and therefore require surgical treatment.

This series demonstrates that surgical refixation of isolated palmar plate injuries effectively restores joint stability, corrects hyperextension, and improves flexion. Early identification with ultrasound is crucial, as conservative management fails once proximal retraction occurs. Given the scarcity of literature on surgical indications for palmar plate ruptures, this study provides new clinical evidence supporting early operative management. Further prospective studies are needed to refine surgical indications and optimize outcomes.

A-0150 SURGICAL MANAGEMENT OF CHRONIC ULNAR COLLATERAL LIGAMENT INJURY OF THE THUMB: A SYSTEMATIC REVIEW

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Introduction: Chronic or missed ulnar collateral ligament (UCL) injuries of the thumb differ from acute tears in tissue quality and surgical options. Whether direct repair or anatomic reconstruction offers superior outcomes in chronic cases remains uncertain.

Aim: To synthesise surgical techniques, rehabilitation protocols, outcomes, and complications for chronic, closed thumb metacarpophalangeal (MCP) UCL injuries in adults.

Material & Methods: PRISMA-aligned systematic review of MEDLINE (PubMed) and Embase (Ovid) from inception to October 2025. Two reviewers independently screened and extracted data. Risk of bias was assessed with ROBINS-I for non-randomised studies and the NIH case-series tool; certainty of evidence was appraised with GRADE. Primary outcomes were MCP stability, patient-reported function, and re-operation/failure.

Results: Of 338 records identified (336 screened after de-duplication), 56 full texts were assessed and 24 studies met inclusion ($n=331$; 19 case series, 5 case reports; no RCTs/comparative trials). Direct repair ($\pm$ suture anchors) was infrequently feasible in chronic cases. Most series described anatomic reconstruction with tendon grafts (commonly palmaris longus; also flexor carpi radialis or plantaris as alternatives) fixed using interference screws, suture anchors, or pull-out techniques. Immobilisation typically lasted 4–6 weeks, some cohorts used temporary K-wire fixation for ~6 weeks. Where reported, reconstruction generally restored stability and produced clinically meaningful functional improvement; re-rupture and reoperation were uncommon. Outcome reporting was heterogeneous follow-up varied, and overall risk of bias was fair to poor, limiting certainty.

Conclusions: For chronic thumb UCL insufficiency without established MCP arthritis, anatomic reconstruction is the predominant and most consistently successful approach. Well- designed prospective comparative studies using validated PROMs and standardised follow-up are needed to define optimal fixation and rehabilitation.

A-0152 DUPUYTREN'S DISEASE AND DERMOFASCIECTOMY WITH FULL-THICKNESS SKIN GRAFTS: RECURRENT CONTRACTURES IN THE ABSENCE OF DISEASE

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Introduction: Recurrent contractures after fasciectomy and z-plasty for Dupuytren's Fibrosis occur in 40% of cases with an estimated serious adverse event (SAE) of 1 to 3%. The recurrence rates and SAE's are probably under-reported. It has been documented that Dupuytren's fibrosis occurs extremely rarely under a full-thickness skin graft performed after dermofasciectomy. The reason we embarked on primary dermofasciectomy and full-thickness skin graft was to abolish recurrent Dupuytren's Fibrosis.

Aim: The current study aims to describe the surgical technique and post-operative management for primary dermofasciectomy with a full-thickness skin graft. It also aims to show rates of recurrent contractures in patients who underwent dermofasciectomy with full-thickness skin grafts.

Material & Methods: This retrospective study was performed from 2016-2023. All patients had a dermofasciectomy with full-thickness grafts from the distal segment to the level of the mid-palmar crease. Total flexion deformities (TFD) were recorded pre- and post-surgery and were classified using Tubiana's staging (REF). Patients' follow-up ranged from 6 months to 5.5 years. Recurrence was defined as contracture of >20 ° from 6-week measurements.

Results: 118 patients and 142 fingers were included in the study. The average follow-up time was 18.7 months. No recurrent contractures in 79.2% of patients. A recurrent contracture rate of 21.8% was recorded. Of these, 61.3% (n=19) had improved overall TFD measures, but had a recurrence of contracture more than 20 degrees when compared to 6-week follow-up; 16.1% (n=5) had no improvement in TFD; and 22.6% (n=7) had worse TFD at the end of their follow-up compared to pre-treatment measures. The average time to recurrent contracture was 12.4 months. No recurrence of Dupuytren's fibrosis was identified in the patients who experienced recurrent contractures.

Conclusions: The current study provides an interesting insight into the evolution of Dupuytren's Disease. While we have demonstrated that dermofasciectomy with FTG abolishes recurrent Dupuytren's fibrosis, there remain problems with recurrent contractures and loss of motion. This raises the interesting question: 'In the absence of disease, what is the cause for recurrent contractures?'.

A-0153 RECURRENT PLEXIFORM SCHWANNOMA IN THE DIGITAL NERVE: LESSONS FROM A RARE CASE AND REVIEW OF THE LITERATURE

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Introduction: Plexiform schwannoma (PS) is a rare benign peripheral nerve sheath tumour and uncommon subtype of schwannomas, accounting for approximately 4.3% of schwannomas. It typically affects the head and neck region and rarely involves the upper limb or digital nerves. Recurrence is uncommon, with very few cases reported in the literature. To the best of our knowledge, we are not aware of any previous reports in the English literature of a recurrent digital nerve PS in a child, less than a decade following the first surgical excision.

Aim: We report a rare case of recurrent PS of the right little finger radial digital nerve in a 16-year-old patient and perform a literature review of this topic.

Material & Methods: The patient presented at the age of 9 years old with a 4-year history of a painless nodular swelling of her right little finger. An attempt was made to dissect the tumour free from the RDN under microscopic magnification but this was not possible. There were no normal terminal nerve branches in the distal phalanx pulp rendering the nerve unsuitable for nerve grafting. The tumour was excised and the proximal stump of the RDN was anastomosed end-to-side with the ulnar digital nerve to decrease the risk of a painful neuroma. Histology of the excised mass showed features consistent with PS. She remained well for four years before presenting with a recurrent swelling, which was excised and confirmed histologically to be recurrent PS. At 7 months follow-up after her most recent surgery, the patient did not have pain, paraesthesia or restricted range of motion. She is still on ongoing surveillance and follow-up.

Results: Although uncommon, schwannoma is the most common type of primary neural tumour in the upper extremity. Without a high index of suspicion, diagnosis can be delayed or mistaken for mimickers such as benign soft tissue tumours or peripheral neuropathy. Oftentimes, the lesion may be asymptomatic as in this case, and both times before the lesion was excised. Symptomatic lesions lack distinctive features from other soft tissue tumours, which may also present with paraesthesia, tenderness and Tinel's sign. Even with this knowledge and advancements in the understanding of schwannomas, misdiagnoses were not infrequently made in existing case series. Regarding long term outcomes, PS recurrence in the upper extremity has only been reported once in the existing English literature, hypothesized to be aggressive due to the child's age, supported by an apparent regression and quiescence of the tumour at puberty.

Conclusions: Our case highlighted the need for long term surveillance in patients following index surgical excision of PS, and an accurate diagnosis relies on maintaining a strong suspicion for this condition despite its many mimickers.

A-0155 UTILITY OF VIDEO-BASED PHOTOPLETHYSMOGRAPHY FOR EVALUATING TISSUE PERFUSION AFTER REPLANTATION AND FREE FLAP SURGERY

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Introduction: After digital replantation or free flap surgery, there is a risk of tissue necrosis due to thrombus formation in the reconstructed vessels. Therefore, capillary refill time (CRT) is routinely assessed every 4–6 hours to monitor circulation. However, this method is subjective, time-consuming, and increases the workload for medical staff. Video-based photoplethysmography (VPPG) is a noninvasive optical technique that detects subtle color changes in the skin corresponding to cardiac pulsation using an ordinary digital camera and image analysis. This technology may be applicable for evaluating perfusion in reconstructed tissues after microsurgical procedures.

Aim: To evaluate the usefulness of video-based photoplethysmography for postoperative assessment of blood flow after digital replantation and free flap surgery.

Material & Methods: Three cases were analyzed. Case 1: a 44-year-old man with incomplete amputation of the right ring finger, in which the radial digital artery was anastomosed. Case 2: a 60-year-old man with complete amputation of the left index finger, treated by replantation. Case 3: a 61-year-old man with a right lower leg skin defect reconstructed with a free latissimus dorsi musculocutaneous flap. After surgery, 15-second stationary videos were recorded using a digital camera. Regions of interest (ROI) were set, and pulse wave analysis was performed to generate two-dimensional power maps representing pulsation intensity. Blood flow of the fingertip or flap was evaluated based on these maps.

Results: In Case 1, necrosis occurred, and the pulse power was lower than that of the surrounding normal tissue. The

pulse wave disappeared after the onset of black necrosis. In Case 2, on postoperative day 1, CRT was not detectable, and poor perfusion was suspected clinically; however, VPPG analysis revealed clear pulsation, and the replanted finger survived. In Case 3, pulsation could be visualized even through the film dressing and vacuum-assisted closure system, and the flap survived.

Conclusions: Video-based photoplethysmography enabled high-sensitivity and objective assessment of microcirculation in reconstructed tissues, even when flow was not visually apparent to the examiner. The technique was applicable not only to fingers but also to free flaps of the lower limb and enabled pulse extraction even through dressing films. VPPG appears to be a useful, noninvasive method for evaluating postoperative blood flow after digital replantation and free flap surgery. Further accumulation of cases and quantitative pulse power analysis may allow prediction of necrotic areas and real-time perfusion monitoring in the future.

A-0156 NORMATIVE DATA ON EXTENSOR POLLICIS LONGUS FORCE, LIFT-OFF HEIGHT, AND TENDON GLIDING AMPLITUDE

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Introduction: The extensor pollicis longus (EPL) is the primary extensor of the thumb, typically assessed with the hand flat on a surface during clinical examination. As the hand is commonly immobilized or functions in 20–30 degrees of wrist extension (the functional position), it is important to understand EPL function in both positions.

Aim: To establish normative reference values for EPL extension force measured with the hand in flat and functional positions and assess normative values for lift-off height and EPL tendon gliding amplitude.

Material & Methods: Two hundred healthy individuals (100 males, 100 females; aged 18–85 years, median age 46 years) were included. A custom-built device capable of measuring isolated finger force with simultaneous electromyography was used. Lift-off test height and EPL tendon gliding amplitude were documented.

Results: EPL force peaked in the third decade of life and declined thereafter. In the flat position, the median extension force was 9.3 N (range: 1.1–18.8 N) for females and 15.8 N (6.4–33.0 N) for males. In the functional position, the median values were 14.0 N (3.8–35.2 N) for females and 21.2 N (6.4–50.6 N) for males. Lift-off height was comparable between the sexes, with median values from 46 to 48 mm (10–75 mm). Likewise, gliding amplitude exhibited no differences between the sexes, with a median of 30 mm (5–50 mm). Both parameters demonstrated weak correlations with extension force (Spearman's $\rho = 0.18$ – 0.24 , $p < 0.05$).

Conclusions: Reference values for EPL extension force, lift-off height, and tendon gliding amplitude were established. Maximal force occurred at 30° wrist extension, peaking in the third decade and declining after the fourth. Lift-off height reflects thumb mobility rather than EPL muscle strength

A-0157 POSTOPERATIVE CT EVALUATION FOR ISOMETRIC TFCC FOVEAL REPAIR WITH INSIDE-OUT TECHNIQUE

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Introduction: During arthroscopic repair of the triangular fibrocartilage complex (TFCC), we have aimed to place sutures at the isometric position described by Matsumoto et al. (The Optimal Suture Placement and Bone Tunnels for TFCC Repair: A Cadaveric Study, *Journal of Wrist Surgery* 2018 Vol.7(5):375-381.) According to this theory, the ulnar attachment site of the TFCC should be centered at the volar–dorsal midpoint of the ulnar fovea, with some mediolateral width, while the TFCC side itself has an isometric point slightly dorsal to the volar–dorsal midpoint of the ulnar styloid base.

To verify whether our sutures were indeed placed at the isometric position, we retrospectively analyzed postoperative CT findings and clinical outcomes in patients who underwent inside-out arthroscopic repair with postoperative consent for CT evaluation.

Methods: We reviewed 24 consecutive patients (14 men, 10 women; mean age 30.4 years) who underwent arthroscopic repair for isolated TFCC foveal tears between January 2021 and December 2022 and consented to postoperative CT evaluation. The mean follow-up period was 5.5 months.

On transverse CT images, the relative position of the bone tunnel between the volar and dorsal rims of the distal radioulnar joint surface was expressed as “% isometric.” Forearm rotation was measured as the ratio of operated to contralateral side (% pronation and % supination), and grip strength as “% grip strength.” Relationships between these parameters and postoperative pain (VAS) were analyzed.

Results: The mean % supination was 98.1%, mean % pronation was 98.0%, and mean % grip strength was 102.3%. The mean postoperative VAS score was 0.7. The average % isometric value was 7.3%. However, in two cases where the % isometric exceeded 20%, significant restriction of supination and worsening of VAS scores were observed.

A-0158 EXPERIENCE MATTERS: PREDICTING ADVERSE EVENTS IN 476 PROXIMAL INTERPHALANGEAL JOINT SURFACE-REPLACING IMPLANTS

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Aim: The aim was to analyse predictors of adverse events and the risk of implant revision surgery up to 10 years after proximal interphalangeal (PIP) joint surface replacement.

Material & Methods: Adverse events in patients who underwent PIP surface replacement with the CapFlex-PIP prosthesis between 2010 and 2024 were analysed. We developed uni- and multivariate logistic regression models to identify predictors of the three events: 1. Limited range of motion (ROM) [= postoperative ROM less than 30°]; 2. Implant-related problems [e.g., implant dislocation, loosening]; 3. Implant revision surgery [implant removal or exchange]. Covariates included in the models were preoperative sociodemographic data, clinical measures, patient-reported outcomes, and surgical details. Odds ratios (OR) were calculated.

Results: We analysed 431 patients with 476 implants and developed the following models:

1. Limited ROM after surgery was 2 times (=OR) more likely in patients who had prior surgery on the affected finger compared to those without prior surgery. In contrast, the odds of limited ROM was 0.41 times lower (a 59% reduction) if the ring finger was affected, 0.45 times lower for joints with an instable radial collateral ligament and 0.96 times lower (a 4% decrease) for each additional year of age ($R^2 = 0.10$).

2. More experienced surgeons had an 83% lower risk (OR: 0.17) of implant-related problems compared to residents. The little finger (OR: 6.2) had a significantly higher risk of implant-related problems compared to the index finger.

3. Greater surgical experience was associated with a 76% reduced risk of revision (OR: 0.24) compared to residents. A 3 mm high distal implant component (size M) reduced the odds of revision surgery (OR: 0.46).

Conclusions: Greater surgical experience was associated with fewer implant-related issues or the need for revision surgery. The risk of limited ROM increased with younger age and prior hand surgeries but decreased for the ring finger and for fingers with lateral joint instability. Surgery on the little finger was associated with a higher risk of implant-related problems. However, the models explained only a small proportion of the variance in adverse events, suggesting that there are additional contributing factors.

A-0159 FIVE-YEAR OUTCOMES OF DUAL-MOBILITY THUMB CMC IMPLANT ARTHROPLASTY: HIGH SURVIVAL AND PATIENT SATISFACTION

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Introduction: Implant arthroplasty has become an increasingly attractive alternative to trapeziectomy for thumb carpometacarpal (CMC I) osteoarthritis. Dual-mobility designs were introduced to address the high complication and revision rates of earlier implants.

Aim: The aim was to analyse patient-reported and clinical outcomes, as well as implant survival, 5-years after thumb CMC arthroplasty with the Touch® prosthesis (KeriMedical, Switzerland).

Material & Methods: All patients receiving a Touch® implant were prospectively documented in a single-center registry. For the analysis of 5-year outcomes, we included patients who underwent primary thumb CMC arthroplasty between May 2019 and September 2020. Preoperatively and at 5 years, patients completed the brief Michigan Hand Outcomes Questionnaire (MHQ, range 0–100), rated pain during daily activities on a Numeric Rating Scale (range 0–10), and reported satisfaction with treatment outcome on a 5-point Likert scale. Key pinch strength was assessed with a pinch gauge. Baseline and 5-year outcomes were compared using linear mixed-effects models with follow-up time, age, and gender as fixed effects. Kaplan–Meier survival analysis was performed on the full cohort of patients treated up to September 2025. **Results:** A total of 102 patients underwent surgery until September 2020, and 90 (88%) completed 5-year follow-up. Patient-reported outcomes improved significantly: the mean brief MHQ score increased from 45 (± 14) at baseline to 88 (± 15) at 5 years ($p \leq 0.001$), while pain scores decreased from 7.5 (± 1.6) to 1.0 (± 1.7 ; $p \leq 0.001$). Key pinch strength improved from 5.2kg (± 2.8) to 6.8kg (± 2.1 ; $p \leq 0.001$). At final follow-up, 91% of patients reported being satisfied or very satisfied with their surgical outcome.

Until September 2025, 687 patients were treated with the Touch® implant. Eighteen patients underwent revision surgery, corresponding to an estimated 5-year implant survival of 93% (95% confidence interval: 88–97).

Conclusions: This prospective registry study demonstrates that dual-mobility thumb CMC implant arthroplasty provides good medium-term outcomes. At 5 years, patients reported substantial and sustained improvements in function and pain, high levels of satisfaction, and reliable restoration of key pinch strength. Importantly, the 5-year implant survival rate of 93% indicates that the dual-mobility implant arthroplasty is durable and safe, supporting its role as a standard surgical option for appropriately selected patients with isolated thumb CMC osteoarthritis.

A-0160 WHAT ARE RISK FACTORS FOR IMPLANT FAILURE AND ASSOCIATED REVISION SURGERY AFTER THUMB CARPOMETACARPAL IMPLANT ARTHROPLASTY?

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Aim: The aim was to identify risk factors of implant failure and associated revision surgery up to 5 years after thumb carpometacarpal (CMC) implant arthroplasty.

Material & Methods: Implant failure and associated revision surgery in patients who underwent thumb CMC implant arthroplasty with the Touch prosthesis between 2018 and 2024 and who should have at least a 1-year follow-up were analysed. The following pre- and intraoperative variables were included into univariate logistic regression models to identify associations with implant failure: age, gender, affected hand, diagnosis, Eaton stage of osteoarthritis, cysts, pain, brief Michigan Hand Outcomes Questionnaire, mental and overall health measured with the EQ-5D-5L, key pinch strength, hyperextension of the metacarpophalangeal joint, surgeon experience, cup shape, neck inclination, joint capsule stitched or resected. Variables with $p \leq 0.2$ and clinically relevant variables were further entered into a multivariate logistic regression model. Odds ratios (OR) were calculated.

Results: In total, 474 patients (24% males) received 546 implants. Out of 546 implants, 25 implants were revised (4.6%)—15 in female and 10 in male patients. The reasons for revisions were cup loosening ($n=8$), impingement ($n=5$), implant dislocation ($n=5$), polyethylene liner fracture ($n=5$) and others ($n=2$). The mean time of revision was 18 (± 13) months after primary surgery.

Univariate models showed possible associations only for male gender ($p=0.07$) and preoperative pain ($p=0.06$). These variables and key pinch strength, which we hypothesized would be relevant, were entered into a multivariate model. This model ($R^2=0.05$) showed that males had a 2.75-fold higher risk of implant failure compared to females ($p \leq 0.05$). Higher baseline pain was associated with a slightly higher risk of implant failure ($OR=1.41$, $p \leq 0.02$), but key pinch strength did not predict implant failure ($OR: 1.01$, $p=0.9$).

Conclusions: Male patients seem to have a higher risk of implant failure, probably due to greater mechanical loading on the prosthesis. Nevertheless, the multivariate model explained only a small proportion of the variance in implant failure due to the limited number of available cases.

A-0161 LONG-TERM OUTCOMES AFTER PROXIMAL INTERPHALANGEAL JOINT ARTHROPLASTY USING A SURFACE-REPLACING IMPLANT: A 10-YEAR REGISTRY ANALYSIS

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Aim: The aim of this registry-based study was to analyse patient-reported and clinical outcomes as well as implant survival ten years after proximal interphalangeal (PIP) joint arthroplasty.

Material & Methods: All patients receiving a CapFlex-PIP prosthesis (KLS Martin, Germany) were prospectively documented in a single-center registry. For the analysis of 10-year outcomes, we included patients who underwent primary PIP arthroplasty between May 2010 and May 2015. Preoperatively and at ten years, patients completed the brief Michigan Hand Outcomes Questionnaire (MHQ, range 0–100) and rated pain during daily activities on a Numeric Rating Scale (range 0–10). Active range of motion (ROM) of the affected PIP joint was measured with a goniometer. Deviations from the longitudinal joint axis was assessed on posteroanterior radiographs. Baseline and 10-year outcomes were compared

using linear mixed-effects models with follow-up time, age, and gender as fixed effects. Kaplan–Meier survival analysis was performed on the full cohort of patients treated up to September 2025.

Results: A total of 95 PIP joints were operated on until May 2015, and 58 (61%) completed 10-year follow-up. Patient-reported outcomes improved significantly: the mean brief MHQ score increased from 48 (± 13) at baseline to 69 (± 19) at ten years ($p \leq 0.001$), while pain scores decreased from 6.7 (± 1.5) to 1.5 (± 1.9 ; $p \leq 0.001$). ROM significantly increased from baseline 48° (± 18) to 61° (± 19) at one year ($p \leq 0.01$), with a slight, non-significant decrease to 57° (± 24) at ten years ($p = 0.75$). Axis deviation of more than 5° was observed in 71% of the joints preoperatively but in only 11% at ten years. By September 2025, a total of 548 implants had been placed. Thirty-eight implants were revised, corresponding to an estimated 10-year implant survival of 86% (95% confidence interval: 81–93). Most revisions occurred within the first 2.5 years postoperatively.

Conclusions: Ten years after PIP joint arthroplasty with the CapFlex-PIP prosthesis, patients demonstrated substantial and sustained improvements in hand function and pain reduction. ROM gains were largely maintained over time, and joint axis alignment improved significantly. Implant survival at ten years was high, with most failures occurring early after surgery. These findings support the long-term effectiveness and durability of the CapFlex-PIP prosthesis for primary PIP joint arthroplasty.

A-0162 SHORT AND MIDDLE TERM CLINICAL RESULTS OF THE SILICONE MCP (INTEGRA) IMPLANT ARTHROPLASTY OF THE METACARPOPHALANGEAL JOINTS FOR RHEUMATOID ARTHRITIS AFFECTING THE HANDS

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Introduction: There have been few reports of metacarpophalangeal (MCP) joint arthroplasty using the SILICONE MCP (Integra), and detailed clinical outcomes are unknown.

Aim: We report the short- to mid-term treatment outcomes of MCP joint arthroplasty using the SILICONE MCP for finger disorders caused by rheumatoid arthritis.

Material & Methods: We retrospectively reviewed 66 fingers from 17 patients who underwent MCP joint arthroplasty using the SILICONE MCP and had a follow-up period of at least 2 years. The mean age at the time of surgery was 67.7 years, and the mean follow-up was 4.2 years. Preoperative and postoperative evaluations included measurement of clinical (active range of MCP joint motion, grip strength), radiographic (ulnar drift, implant fracture), and self-administered upper limb disability (the Hand20 questionnaire) parameters. The Hand20 scores range from 0 to 100, with high scores indicating more disability.

Results: The MCP joint active extension significantly improved (from -61° to -4°), active flexion significantly decreased (from 83° to 63°), and total range of motion significantly improved (from 22° to 58°) after surgery. Ulnar deviation significantly improved (from 40° to 8°), grip strength (from 6.3 kg to 7.0 kg) and Hand20 (from 70.3 to 60.0) showed a tendency to improve after surgery. Implant fractures occurred in 6 fingers, and were confirmed 24-77 (median 56) months after surgery. No additional surgery was necessary. In a patient undergoing treatment for oral cancer, implant infection was found in one finger 29 months after surgery, and the implant was removed.

Conclusions: Like other silicone implants, SILICONE MCP caused a shift in joint range of motion toward extension, the total range of motion was significantly improved, and ulnar deviation was also improved, so good clinical outcomes can be expected in the short to medium term even for cases with poor total range of motion before surgery.

A-0163 VALUE OF THE MRI IN BRACHIAL PLEXUS WARFARE INJURIES

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Introduction: The most frequent indications for brachial plexus MRI are traumatic lesions. In peacetime, motorcycle injuries took first place; however, in the realities of war, the frequency of gunshot and shrapnel injuries on the battlefield increased. Because brachial plexus injuries require precise diagnostics to assess injury severity, we consider the role of MRI in their diagnosis.

Aim: To present our experience and practical cases of performed MRI, followed by a comparison during surgery.

Materials & methods: Brachial plexus MRI performed on a 1.5 T tomograph in 45 patients (90% men, 22-47 years old) — used sequences in three planes: T2_dix, T2_tirm, T1WI, DWI, T2_spc, T2WI. Surgical intervention was performed in 96% of the patients examined.

Results: Identified preganglionic injuries in our case series were: pseudomeningocele in 6%, complete or partial root avulsion in 12% of patients, and spinal cord injuries in 2%.

Postganglionic lesions were: brachial plexus rupture with neuroma formation – in 65%, secondary damage to the trunks due to the fracture of the 1st rib or clavicle – 8%, brachial plexus compression with fibrotic tissues, and others – in 7%.

Discussion: MRI provides insight into the integrity of the brachial plexus, detects nerve swelling, and reveals injury to paraneural structures such as bones, muscles, and vessels. By MRI, we can also track the severity of denervation in target muscles. It is essential to identify preganglionic lesions; an isometric T2 sequence should be used to supplement a brachial plexus MRI and assess the intradural portion of the spinal nerves.

Conclusions: Brachial plexus MRI can help identify traumatic lesions and correlates well with intraoperative findings. Timely and accurate MRI performance is crucial for selecting treatment strategies.

A-0166 COMPUTER ASSISTED SURGERY IN HAND SURGERY : APPLICATION OF 3D MODELING AND SIMULATION IN CLINICAL PRACTICE

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Introduction: In recent years, computer-assisted surgical techniques have become increasingly common in various orthopedic subspecialties, including spine and joint surgery. Their application in hand surgery, however, remains relatively limited. Advances in three-dimensional (3D) imaging, modeling, and printing technologies now make it possible to visualize complex bone deformities and plan surgical procedures with greater precision.

Aim: This study reports three cases of hand surgery in which computer-assisted technologies were utilized for deformity assessment, surgical simulation, and intraoperative guidance.

Material & Methods: From April 2020 to March 2022, three patients underwent hand surgery utilizing computer-assisted methods. Preoperative computed tomography (CT) scans of the affected areas were obtained, and STL files of the target bones were reconstructed using specialized software.

Case 1: STL files of the affected and contralateral sides were imported into the software to calculate the degree of rotational and angular deformity. These quantified data were used as intraoperative reference values to guide reduction.

Case 2: STL files were used to print a three-dimensional (3D) model of the middle phalanx. Reduction was achieved using

ligament taxis with external fixation, and the 3D full-sized bone model served as an intraoperative reference to confirm fragment alignment and screw insertion points. Dorsal screw fixation was then performed.

Case 3: For corrective osteotomy of a malunited metacarpal fracture, preoperative simulation was conducted. STL files of the affected and contralateral bones were analyzed to determine the appropriate osteotomy site and correction angle. A 3D printer was used to make models representing the bone before and after osteotomy, as well as the graft bone.

Results: In Case 1, preoperative quantitative analysis of deformity angles enabled efficient intraoperative correction, reducing the time required for reduction.

In Case 2, intraoperative use of a 3D model allowed the surgeon to visualize bone morphology on the direct surgical field, assisting accurate screw placement and reducing dependence on intraoperative fluoroscopy.

In Case 3, the osteotomy plan determined during the preoperative simulation was implemented precisely and smoothly during surgery.

Overall, the incorporation of computer-assisted techniques improved preoperative understanding of three-dimensional bone morphology and contributed to more efficient and accurate surgical execution.

Conclusions: Manual correction based on surgeon experience and correction guided by computer simulation represent two ends of the spectrum in operative planning. Although experienced hand surgeons may rely heavily on their tactile and visual judgment, computer-assisted technology provides objective, three-dimensional insights that enhance surgical precision and reproducibility. The integration of such technology allows surgeons to better visualize deformities, optimize surgical strategies, and potentially improve clinical outcomes. Our experience suggests that this balanced approach—combining surgical expertise with digital planning tools—is a practical and valuable method for modern hand surgery. Further accumulation of cases will be necessary to evaluate its full clinical utility and cost-effectiveness.

A-0167 DEVELOPMENT AND INITIAL VALIDATION OF THE TETRAPLEGIC HAND OPENING AND CLOSING (THOC) SCALE: A NOVEL TOOL FOR CLINICAL AND RESEARCH ASSESSMENT

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Introduction: The injury profile of people who sustain a cervical spinal cord injury is changing. Today cervical spinal cord injury (SCI) frequently results in incomplete SCI and in a older population. Traditionally, the primary goal in tetraplegic hand rehabilitation has been the development of the tenodesis grip, targeting the complete C6-7 injury with wrist extension as the only active function in the hand. Now, with mostly incomplete SCI, the pure tenodesis function is frequently complemented by various active functions and, in many cases, spasticity. The older age of cervical SCI increases the risk of comorbidities and secondary complications. From a surgical perspective, the introduction of nerve transfer as a complement to tendon transfer has lead to new, more complex interventions that aims of improve both the hand opening and closing. To accurately describe this complex clinical picture and evaluate interventions targeting hand opening and closing, standardized terminology and assessment tools are needed.

To address this gap, the development of a scale capable of quantifying hand opening and closing in the tetraplegic hand

was initiated. Predefined key prerequisites for the scale were: a) Inclusion of both fingers and thumb, b) Be independent of voluntary motor function, c) Be feasible for clinical use, and d) Allow calculation for research purposes.

Aim: To describe the development of the Tetraplegic Hand Opening and Closing Scale (THOC Scale) and report initial psychometric testing.

Material & Methods: A working group of five experienced tetrahand therapists from three counties led the development process, beginning with a literature review of existing scales. An expert panel (n=9 therapists from six counties) provided iterative feedback. Three pilot studies (n=24, 10, and 8) were conducted to refine the scale for clarity and clinical relevance. Additionally, individuals living with tetraplegia reviewed the scale for usability and acceptability. Thereafter a full scale survey with initial psychometric testing including intra-reliability and validity was commenced.

Results: The THOC Scale assesses hand opening and hand closing, each rated across the three components: wrist, fingers, and thumb.

In the first pilot test (n=24), tetrahand surgeons and therapists rated the THOC Scale on a 0–5 scale as follows (mean): Clinical relevance: 4.1, Research relevance: 4.5, Fills an assessment gap: 4.3, Ease of understanding: 3.5.

Following expert feedback and refinements, the third pilot test (n=12) showed that 83% agreed or strongly agreed that the scale was easy to understand and the more comprehensive psychometric testing was then commenced. Preliminary data (n=17) indicate 100% strongly/mostly agreement on relevance, clarity, and inclusion of all essential aspects. Early inter-rater reliability results suggest higher agreements in rating fingers than the thumb. Further analyse and inclusion of more participants are needed and will be presented at the conference.

Conclusions: The THOC Scale provides a structured assessment of hand opening and closing across three key components. Initial psychometric testing shows the scale clinically feasible, well-tolerated by patients, and addresses a critical gap in both clinical practice and research. The scale is currently implemented in a multicenter study, and further psychometric validation is ongoing.

A-0168 ONE STAGE SURGICAL RESECTION AND FUNCTIONAL RECONSTRUCTION FOR UPPER LIMB SOFT TISSUE SARCOMA

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Introduction: Nowadays, the gold standard of treatment for extremity soft tissue sarcoma (ESTS) is limb-sparing surgery. When the upper extremity is involved, the functional outcome is frequently poor. A one step resection and functional reconstruction would be advisable to obtain a fast recovery.

Aim: Our study aims at retrospectively analyzing our casuistry of immediate nerves and tendons reconstructions of the upper limb after soft tissue sarcoma resection, while combining a review of the literature.

Material & Methods: A retrospective review was conducted on a consecutive series of patients who underwent an immediate functional reconstruction after soft tissue sarcoma resection of the upper limb between 2015 and 2022 among the IRCCS Foundation “Istituto Nazionale dei Tumori”. The DASH score was considered the primary outcome. The obtained DASH scores were compared through groups which underwent different reconstructive procedures. The literature review was conducted according to the PRISMA criteria among three databases (Pubmed, Embase and Cochrane) using the search

parameters “(((upper extremity) OR (upper limb)) AND (functional reconstruction)) AND (soft tissue sarcoma)”.

Results: The ANOVA procedure applied to the mean DASH scores obtained from different reconstructive procedures reported a statistically significant difference. The literature review reported few articles focusing on immediate functional reconstruction after soft tissue sarcoma resection and only 6 articles were included in the review.

Conclusions: Our review aimed at reporting our casuistry of immediate functional reconstructions after STS of the upper extremity, which is currently the most substantial one reported in literature to set an effective baseline for further studies in the field.

A-0169 A RARE CASE OF DISTAL RADIOULNAR JOINT LOCKING CAUSED BY VOLAR DISLOCATION OF THE ULNAR HEAD Norihiko Sugita¹, Yuzo Honda², Shota Hirashima¹, Toshihiro Kanda¹

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Introduction: We report a rare case of distal radioulnar joint (DRUJ) locking associated with chronic ulnar styloid nonunion and volar dislocation of the ulnar head.

Case: A 36-year-old woman presented with right wrist pain during dishwashing. She was unable to pronate from the supinated position and was referred to our department after reduction at a nearby clinic. Similar episodes had occurred about ten times previously, each requiring manual reduction. She also had a history of wrist fracture in childhood, though details were unknown. On examination, wrist range of motion was 80° dorsiflexion, 85° palmar flexion, and 80° pronation–supination. Although DRUJ instability was present, there was no pain.

Radiographs taken before reduction at another hospital showed volar displacement of the ulnar head and dorsal displacement of the pseudoarthrotic ulnar styloid fragment, both of which resolved after reduction. The ulnar variance was –1 mm. MRI suggested that the foveal attachment of the triangular fibrocartilage complex (TFCC) was located on the ulnar styloid fragment. Post-arthrography CT revealed no contrast filling of the ulnar fovea but pooling of contrast anterior to the ulnar head. Based on these findings, DRUJ locking was diagnosed. Because of recurrent locking, surgery was performed under general anesthesia.

With the forearm in supination, volar pressure on the ulnar head caused volar dislocation and DRUJ locking, accompanied by skin dimpling on the dorsal ulnar side. Arthroscopy revealed a combined rupture of the disc proper and the dorsal capsule, together with laxity of the volar capsule. During locking, the torn disc proper collapsed along the ulnar head. After a 2 mm ulnar-shortening osteotomy, repeat arthroscopy confirmed restoration of volar capsular tension, and locking could no longer be reproduced.

After one month of postoperative immobilization, range-of-motion exercises were initiated. At six months, bone union at the osteotomy site was achieved, with wrist motion of 85° dorsiflexion, 75° palmar flexion, and 85° pronation–supination. No recurrence of locking was observed, and clinical results were excellent.

Discussion: Dislocation of the ulnar head occurs predominantly dorsally, whereas volar dislocation is extremely rare, accounting for approximately 0.02% of all forearm injuries. Most reported cases of volar dislocation are acute, and chronic cases generally involve persistent dislocation or locking. To our knowledge, recurrent DRUJ locking of this nature has not been previously reported.

In this case, DRUJ instability due to TFCC foveal detachment and volar capsular laxity allowed recurrent volar dislocation. During dislocation, the torn TFCC became interposed dorsally against the ulnar head, acting as an obstacle to spontaneous reduction and leading to locking. Ulnar-shortening osteotomy restored tension of the volar structures, eliminated instability, and achieved a favorable postoperative outcome.

Conclusion: Recurrent DRUJ locking caused by volar dislocation of the ulnar head associated with ulnar styloid nonunion is exceedingly rare. Ulnar-shortening osteotomy effectively restored joint stability and prevented recurrence.

A-0170 MODIFIED ULTRASONOGRAPHIC CLASSIFICATION OF TENDINOUS MALLET INJURIES BASED ON A COMBINATION WITH WANG'S CLASSIFICATION HIGHLIGHTING LATERAL BAND INVOLVEMENT

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Introduction: Although ultrasonography is useful for assessing soft-tissue injuries, its role in classifying tendinous mallet injuries remains underdefined. Wang et al. suggested an ultrasonographic classification method for acute mallet finger injuries. In this classification, Type B represents a complete rupture of the extensor tendon without an associated fracture, while Type C indicates a contusion of the extensor tendon.

Aim: This study aimed to propose a modified ultrasonographic classification system that combines the framework of Wang's classification with additional subtypes emphasizing lateral band involvement to improve diagnostic accuracy and prognostic assessment.

Material & Methods: A retrospective cross-sectional study was performed on 36 patients with acute closed tendinous mallet injuries of the fingers. All patients underwent ultrasonographic evaluation. Based on the modified classification, Wang's Type B was subdivided into Subtype B1 (complete terminal tendon rupture) and Subtype B2 (rupture of either the radial or ulnar slip of the lateral band). Clinical outcomes were recorded at a minimum of four months follow-up. Data on pinch strength, pain, extension lag, and functional scores were analyzed to compare outcomes across the three injury types.

Results: Thirteen Subtype A, 15 Subtype B1, and eight Subtype B2 injuries were identified. In all types, as the length of the injured tendon increased, pinch power relative to the contralateral side was significantly weaker. Additionally, the injured tendon was significantly longer in type C injuries than in type B1 and B2 injuries. As the length of the injured tendon increased, pinch strength relative to the contralateral side decreased across all injury types. Nevertheless, the pain score, functional score, and initial extension lag did not show statistically significant variations among injury types. Crawford criteria showed that types B2 and C injuries mostly were graded as "excellent" or "fair," whereas type B1 injuries were more often classified as "poor" or "fair."

Conclusions: The modified ultrasonographic classification provides a more detailed framework for assessing tendinous mallet injuries by integrating Wang's classification and distinguishing partial lateral band ruptures. This approach enhances diagnostic precision and may improve functional prognostication.

A-0171 ULNAR STUMP STABILIZATION USING EXTENSOR DIGITI MINIMI TENDON IN THE SAUVE-KAPANDJI PROCEDURE

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Introduction: The Sauvé-Kapandji procedure is a well-established surgical option for the treatment of distal radioulnar joint (DRUJ) disorders, particularly those associated with osteoarthritis and instability. However, postoperative instability

or painful prominence of the proximal ulnar stump remains a recognized complication. Various methods for stabilization of the ulnar stump have been reported, including the use of half slips of the flexor carpi ulnaris (FCU) or extensor carpi ulnaris (ECU) tendons, forearm fascia, or pronator quadratus. Each method has its own technical demands and donor site morbidity. We report a case in which the extensor digiti minimi (EDM) tendon, rendered redundant after tendon transfer for extensor tendon rupture associated with distal radioulnar joint osteoarthritis, was utilized to stabilize the proximal ulnar stump in the Sauvé-Kapandji procedure.

Aim: The purpose of this report is to present a simple, low-morbidity technique for proximal ulnar stump stabilization using the extensor digiti minimi tendon, and to discuss its potential advantages compared with conventional methods.

Material & Methods: An 86-year-old woman presented with a one-month history of little finger extension loss. Physical examination and imaging suggested rupture of the extensor digitorum communis (EDC) tendons secondary to osteoarthritis of the distal radioulnar joint. The patient underwent wrist arthroplasty using the Sauvé-Kapandji procedure combined with tendon transfer. Intraoperatively, complete rupture of the EDC to the little finger (EDC5) and the extensor digiti minimi (EDM) tendon was identified. The EDC5 was transferred to the EDC4 to restore finger extension. The EDM tendon was dissected proximally and used for ulnar stump stabilization. Bone tunnels, each 3.0 mm in diameter, were created in the proximal ulnar stump and in the ulnar side of the radius at the osteotomy site. The tendon was passed through these tunnels, tensioned appropriately, and securely sutured.

Results: At three months after surgery, the patient showed no pain, instability, or prominence at the proximal ulnar stump. Forearm rotation was well preserved, with 80° of pronation and 80° of supination. The postoperative course was uneventful, and no complications related to tendon fixation were observed.

Conclusions: The extensor digiti minimi tendon is frequently redundant following reconstruction of little finger extension. Utilizing this tendon for ulnar stump stabilization eliminates the need to harvest other tendons, thereby minimizing donor site morbidity and operative time. The present technique is straightforward, requires no additional incision, and provides adequate stability with minimal invasiveness. Although this report describes a single case, the favorable functional and radiographic outcomes suggest that the method may represent a useful alternative option for proximal ulnar stump stabilization in the Sauvé-Kapandji procedure. Further clinical experience and longer follow-up are required to evaluate its long-term effectiveness and reproducibility.

A-0172 LONG TERM OUTCOMES OF CAMPTODACTYLY IN OUR CASE SERIES

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Introduction: Camptodactyly is a congenital abnormality characterized by flexion deformity of the fingers. Although conservative treatment with orthoses and surgical intervention have been reported, there is no consensus regarding their efficacy. We previously examined both conservative and surgical treatments and reported that orthotic therapy is effective as an initial treatment; however, some cases exhibit resistance to conservative management.

Aim: To evaluate the long-term treatment outcomes of camptodactyly, including radiographic findings, and to examine its characteristics.

Material & Methods: Eight cases of camptodactyly (nine fingers) treated at our department between 2005 and 2020, with more than five years of follow-up available, were included in this study. The cohort comprised three males and five females; and the affected side was 2 right, 5 left, and 1 bilateral. All cases were classified as isolated type without associated

anomalies or congenital malformations, excluding partial syndromic forms. The patient's age at initial consultation was 24.5 months old (range, 1–60 months old). The follow-up period was 12.8 years (range, 5.0–21.1 years). We evaluated the affected finger, treatment method, range of motion, and radiographic findings.

Results: The affected fingers included the index finger in one case, the middle finger in three cases, the ring finger in two cases, and the little finger in three cases. Initial treatment consisted of orthotic therapy using extension splints for all cases. Surgical intervention was performed on three fingers with residual extension limitations of over 30° and poor improvement underwent surgical intervention. The age at the time of surgery was 4.3 years (range, 3–6 years). Of the six fingers treated conservatively, five exhibited favorable improvements in range of motion, while one finger continued to demonstrate residual extension restriction. Among the three surgical cases, one finger showed good improvement, whereas two experienced recurrence of extension limitation. Radiographic findings, excluding one case where image evaluation was challenging, revealed flattening or deformity of the proximal phalangeal head at initial presentation in all cases. At the final follow-up, deformity was observed in six cases, including three conservatively managed and three surgically treated. No evidence of joint degeneration was observed.

Conclusions: Long-term outcomes of camptodactyly treatment suggest that orthotic therapy can achieve relatively favorable results, whereas the efficacy of surgical intervention remains uncertain. Although deformity of the proximal phalanx may persist over mid-long-term follow-up, it appears to be unrelated to limitations in joint range of motion.

A-0173 OUTCOME OF OPERATION FOR DISTAL RADIUS FRACTURE ACCORDING TO BONE DENSITY

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Introduction: Distal radial fractures (DRF) are frequently the first fragility fracture.

Aim: To investigate cases of DRF that underwent surgery and subsequently measured bone mineral density (BMD) after injury.

Material & Methods: From 2020 to 2022, 715 cases underwent surgery for DRF at our department's affiliated facilities and were available for follow-up observation for at least 6 weeks. Among the 137 cases (19%) who underwent femoral neck BMD measurement, this analysis targeted those who sustained injuries from low-energy trauma due to a fall. Patients were stratified based on a % Young Adult Mean (YAM) value of 70%. Age, gender, fracture type, presence of ulnar fracture, and loss of reduction were investigated. Fracture type was classified using the AO/OTA classification. Loss of reduction was assessed by evaluating volar tilt (VT), radial inclination (RI), and ulnar variance (UV) immediately postoperative and at the final follow-up, and calculating the difference between these measurements. Statistics were analyzed using the Mann-Whitney U test and Fisher's exact test.

Results: The study included 126 cases, comprising 53 cases in the high-value group with %YAM values of 70% over and 73 cases in the low-value group with values below 70%. The mean age was 69 years in the high-value group and 71 years in the low-value group, with the low-value group being significantly older ($p = 0.02$). The high-value group included only females, while the low-value group included 5 males and 68 females. The mean follow-up periods were 10 months and 13 months, respectively. In the high-value group, there were 22 type A fractures, 5 type B fractures, and 26 type C fractures. In the low-value group, there were 29 type A fractures, 2 type B fractures, and 42 type C fractures. The proportion of comminuted fractures (A3, C2, C3) was 75% in the high-value group and 55% in the low-value group, with a significantly higher proportion in the high-value group. The incidence of ulnar fracture complications was 72% in the high-value group

and 63% in the low-value group. Loss of reduction in the high-value group was VT 4.9 degrees, RI 2.4 degrees, and UV 1.1 mm, while in the low-value group it was VT 3.4 degrees, RI 2.2 degrees, and UV 0.7 mm; only VT was significantly greater in the high-value group. One case of reoperation due to loss of reduction was observed in the low-value group. Conclusions: The significantly greater loss of reduction in the high-value group may be influenced by the higher proportion of comminuted fractures in that group. In DRF, favorable outcomes were achieved even with low bone density through appropriately robust fixation.

A-0174 CHALLENGES IN THE SURGICAL TREATMENT OF THE PERIPHERAL NERVE WARFARE INJURIES

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Introduction: The specifics of modern warfare determine the severity of injuries, which, in turn, burden and complicate medical aid. According to the data of the National Military Medical Centre statistics department, 69% of warfare injuries are injuries to extremities. About 32% of the injured had peripheral nerve lesions. Nerve lesion combined with injury of other structures was observed in 86%. Injury of two or more nerves simultaneously – 15%.

Aim: To highlight the main challenges in surgical treatment of the peripheral nerve warfare injuries, such as: polystructural nature of the injury, significant fibrotic and ischemic tissue changes, and frequent massive nerve defects.

Materials and methods:

We analysed the nature of injury and surgical treatment in 732 patients (males – 704; mean age – 36.2 ± 10.23 years) with war-related peripheral nerve injuries. About 53.1% had a primary nerve defect that required surgical treatment.

Results: At the time of surgery, the average size of the primary nerve defect was about 4.88 ± 3.22 cm. Moreover, primary nerve defects in the lower extremities (5.26 ± 3.14 cm) were significantly ($p < 0.01$) larger than those in the upper limbs (4.77 ± 3.26 cm). In the case of shrapnel injury (90% of the patients), significantly greater ($p < 0.05$) damage to the surrounding tissues was observed (bone fractures – 46.9%; massive skin defects – 10.5%; central vessel lesion – 7.8%; muscle defects that required reconstruction – 7.0%). A nerve defect of 5-10 cm was observed in 28% of patients, and a defect of more than 10 cm in 5%.

Discussion: Before starting the reconstruction of peripheral nerves, the following conditions must be fulfilled: 1) Eradication of infection; 2) Soft tissue reconstruction with flaps; 3) Achievement of final bone stability. In the case of peripheral nerve injury, a disruption of the blood supply occurs not only in the nerve but also in paraneural tissues, leading to fibrous degeneration of the mesoneurium, the formation of additional "fixation points" of the nerve, and its secondary compression and ischemia. The use of lipofilling can help reconstruct the nerve gliding system. Combinations of nerve and tendon transfers can help with early function.

Conclusions: Warfare injuries of the peripheral nerves are complex and, in most cases, polystructural injuries that require staged planning and an understanding of the extremity's final function from the beginning.

A-0175 FLEXOR CARPI RADIALIS AND DORSAL INTERCARPAL COMPLEX ELONGATION AFTER 3 LIGAMENT TENODESIS

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Introduction: To improve the surgical procedure and rehabilitation after surgery, a better understanding of the biomechanical properties of the three ligament tenodesis (3LT) procedure is necessary.

Aim: The objective of this anatomical specimen-based study is to evaluate the absolute and relative elongation of the FCR tendon slip and the dorsal intercarpal complex (DIC) during flexion. Secondary, this study aims to assess the reconstructions capacity to endure maximal flexion without failure. In the event of failure, we aim to objectify the nature of the failure.

Material & Methods: This study examined elongation in relation to flexion, and type of failure after 3LT using ten anatomic specimens, each wrist undergoing five tests.

Results: At 80° flexion mean elongation of the flexor carpi radialis (FCR) tendon slip was 0.96 ± 0.38 mm. Mean elongation of the Dorsal Intercarpal Complex (DIC) was 3.75 ± 0.91 mm. at 80° flexion. Relative elongation at the FCR tendon slip was 4.1% and 33.4% at the DIC. In two tests (4%), sutures loosened at the proximal side of the DIC after 30° flexion. Ruptures of the radiotriquetral ligament, pull-outs of the bone anchor or FCR tendon ruptures were not observed.

Conclusions: This experiment suggests that following 3LT, the most elongation occurs at the DIC. Since instances of failure were noted at the proximal aspect of the DIC, if early active motion protocols are used, it is recommended to initiate wrist flexion with a limitation to 30° wrist flexion.

A-0176 RECOVERY PROFILES AFTER CARPAL TUNNEL RELEASE: A PROSPECTIVE COMPARISON OF ULTRASOUND-GUIDED, ENDOSCOPIC, AND MINI-OPEN TECHNIQUES

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Introduction: Carpal tunnel syndrome is the most frequent entrapment neuropathy of the extremities. Surgical decompression of the median nerve has been the preferred treatment, however different surgical approaches have been described. Our study aims to compare three of them - endoscopic, ultrasound-guided, and mini-open carpal tunnel release - in their ability to achieve effective decompression while minimizing postoperative morbidity and facilitating rapid functional recovery. Ultrasound-guided release has recently gained popularity and is believed to result in faster recovery due to the minimally invasive aspect of the procedure. To our knowledge, this is the first prospective study comparing these three techniques simultaneously. Pain, restoration of normal function, return to work or daily activities and safety are the most important outcome parameters. Our hypothesis is that ultrasound-guided release will lead to faster recovery, less postoperative pain, and earlier return to work or daily activities while maintaining equivalent safety and efficacy.

Aim: Prospectively compare the recovery profiles, clinical outcomes, and safety of ultrasound-guided, endoscopic, and mini-open carpal tunnel release techniques, with the goal of determining whether ultrasound-guided release offers faster recovery, reduced postoperative pain, and earlier return to work or daily activities while maintaining equivalent efficacy and safety.

Material & Methods: A prospective cohort of 150 patients with idiopathic carpal tunnel syndrome was evaluated between May and December 2025. The study was conducted in our hand unit consisting of four full-time hand surgeons, two performing endoscopic release, one performing mini-open release and one performing ultrasound-guided release. Patients were treated with the preferred method of the surgeon they visited by chance. 50 patients were treated by ultrasound-guided release, 50 were treated by mini-open release and 50 underwent endoscopic release. Outcome measures included the Boston Carpal Tunnel Questionnaire (BCTQ), QuickDASH, Visual Analog Scale (VAS) for pain and the Patient and Observer Scar Assessment Scale (POSAS), grip strength and time to return to work or daily activity. Data were collected daily during the first two postoperative weeks, then at 2, 3, and 4 weeks, and subsequently at 3 and 6 months. Further follow-up up until 5 years is planned to look for long term differences in outcome. Also the differences in cost and ecological influences will be taken into account as they are increasingly important in current healthcare.

Results: We will present the results of this prospective study aiming to evaluate whether all three surgical techniques are equally effective or if one offers advantages in terms of recovery. The analysis will focus on postoperative pain, restoration of function and earlier return to work or daily activities as well as safety of the procedure.

Conclusions: All three surgical techniques – ultrasound-guided, endoscopic and mini-open – aim to achieve the same goal by effectively decompressing the median nerve in the carpal tunnel and thus restoring the balance in the hand. This study evaluates whether one of the techniques provides superior results over another resulting in faster recovery for our patients and possibly guiding future treatment strategies in carpal tunnel release surgery.

A-0177 DEVELOPMENT OF A NEW ARTHROSCOPIC TECHNIQUE WITH TENDON GRAFT FOR FLAP CMC ARTHRITIS

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Introduction: Osteoarthritis of the trapeziometacarpal joint (TMJ) is a common condition in elder patients, who develop pain at the base of the thumb and limitations in activities of daily living.

Multiple surgical treatments have been described for TMC osteoarthritis, but some complications of the different treatment options have been reported. Arthroscopic techniques have been developed to reduce these complications.

We have developed a new surgical technique for the arthroscopic treatment of TMC osteoarthritis, which achieves stability in the TMC joint by combining different biomechanical mechanisms that restore the thumb and hand to their natural pincer function. This technique allows the surgeon to control factors such as the position of the thumb and the tension of the tendon suspension, adding a biological factor to the integration between tendon and bone.

Aim: To develop an appropriate surgical technique that solves the different pathological components of rhizarthrosis with minimal complications.

Material & Methods: We present a 71 year old right handed woman who works at home and present pain in the CMC-1 joint in both hands, these symptoms began 2 years ago and her left hand (Non Dominant) is more painful than right one, we did hand X-rays and found Rizarthrosis in stage III of the Eaton-Littler scale.

Under tourniquet anesthesia we gained access through two arthroscopic portals (1-U and Volar/Tenar), the distal portion of the trapezium is partially resected and verified with an image intensifier. A transverse approach is made in the region of the first extensor compartment at the level of the radial styloid, the APL tendon is identified, and a release and hemitenon harvest is performed with tenotomy from its most proximal portion, preserving its distal insertion. The loose proximal end is recovered through the 1U portal with subcutaneous passage of the flap, verifying its proper insertion at the base of the first metacarpal. With fluoroscopic assistance, a 2.5 mm drill bit is passed to the base of the second metacarpal and

an open (bicortical) tunnel is made in it. The flap is passed intra-articularly and complete passage through the tunnel at the base of the second metacarpal is verified. The necessary tension is established, preserving adequate intermetacarpal space, and the APL tendon is fixed within the canal of the second metacarpal with an interference screw (biotenodesis). Results: The patient improved from a preoperative Quick Dash score of 68/100 disability to a score of 11.36/100 in the sixth postoperative week.

Thumb functionality in terms of mobility was rated at 10 on the Kapandji score.

Conclusions: This is a reproducible technique that combines different biomechanical mechanisms previously defined as effective for the treatment of TMC osteoarthritis.

It is a technique that allows control of tension and, therefore, the position of the first metacarpal bone in relation to the TMC joint and the intermetacarpal joint. It provides a factor of biological osseointegration between the tendon flap and the second metacarpal bone.

A-0178 VASCULARIZED BONE GRAFTING FOR EXTENSOR POLLICIS LONGUS RUPTURE CAUSED BY SCAPHOID NONUNION, CONVERTED TO TWO-STAGE RECONSTRUCTION DUE TO INTRAOPERATIVE CARDIAC ARREST

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Introduction: Rupture of the extensor pollicis longus (EPL) tendon associated with scaphoid nonunion is extremely rare. We report a case of scaphoid nonunion complicated by EPL tendon rupture. Although vascularized bone grafting and tendon transfer are typically performed separately in a staged manner, we initially planned to perform both procedures simultaneously in a single operation. However, intraoperative cardiac arrest occurred, necessitating staged reconstruction. Bone union was ultimately achieved following the secondary procedure.

Case: A 47-year-old man had a history of a left wrist fracture around the age of 20; however, the details were unclear. He had no history of cardiovascular disease. Approximately two years before presentation, he noted progressive difficulty in extending the left thumb interphalangeal (IP) joint without preceding trauma or identifiable cause. Radiographs and CT scans revealed scaphoid nonunion with sclerosis, humpback deformity, and a third fragment, indicating tendon rupture at the nonunion site.

Locking plate fixation with vascularized bone grafting from the distal radius and transfer of the extensor indicis proprius (EIP) tendon to the extensor pollicis longus (EPL) tendon were planned under general anesthesia. The vascularized pedicle was elevated using the Zaidenberg method, and temporary plate fixation was performed on the palmar side of the scaphoid. The tourniquet was released 120 minutes after the start of surgery. Six minutes later, ventricular fibrillation occurred, and spontaneous circulation was restored after four defibrillation attempts.

The operation was discontinued; the vascularized bone graft was returned to the donor site, the skin was sutured, and the patient was transferred to a cardiac specialty hospital. The patient was diagnosed with vasospastic angina and recovered without sequelae. Three weeks later, secondary surgery was performed under axillary nerve block. After confirming viable blood flow in the vascular pedicle, bone grafting with locking plate fixation and tendon transfer were completed. Postoperatively, a thumb spica cast was applied for six weeks. At three months postoperatively, bone union had been achieved, and satisfactory extension of the left thumb IP joint was observed. At six months postoperatively, the Mayo wrist score was 75%.

Discussion: In this case, long-standing scaphoid nonunion with humpback deformity and the presence of a third fragment may have caused the tendon rupture. Although a two-stage operation was required, solid fixation with a locking plate achieved bone union, suggesting the effectiveness of this staged surgical strategy.

A-0179 PROGNOSTIC THRESHOLD FOR CORONAL DEVIATION PROGRESSION AFTER VOLAR SILICONE ARTHROPLASTY FOR THE PROXIMAL INTERPHALANGEAL JOINT OSTEOARTHRITIS

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Introduction: Coronal deviation is a critical determinant of postoperative function and implant survival after proximal interphalangeal (PIP) joint arthroplasty, yet the safe limit of preoperative deformity remains unclear.

Aim: This study aimed to define the preoperative deviation threshold associated with postoperative instability after volar silicone arthroplasty for PIP joint osteoarthritis.

Material & Methods: Thirty-eight fingers in 26 patients (mean age, 67.8 years) with primary PIP joint osteoarthritis underwent volar silicone arthroplasty. All cases had at least one year of radiographic follow-up.

Worsening progression was defined as a $>10^\circ$ increase in the final coronal deviation angle compared with the baseline. Functional outcomes, including pain visual analogue scale (VAS), Hand20 score, and PIP/DIP range of motion, were reviewed in cases with complete data. Correlation and subgroup analyses were performed.

Results: Postoperative coronal deviation progression was strongly associated with preoperative deformity severity.

- Preoperative $\geq 20^\circ$ deviation $\rightarrow$ 100% developed $\geq 15^\circ$ worsening at final follow-up.
- Preoperative $< 20^\circ \rightarrow$ the majority remained stable, though 20–30% worsened even when the initial deviation was $< 10^\circ$.

A moderate positive correlation was observed between pre- and postoperative deviation ($r = 0.45$, $p = 0.0046$).

The proportion of cases with preoperative deviation $\geq 10^\circ$ and the rate of postoperative worsening ($\geq 10^\circ$) did not differ significantly between index/middle and ring fingers (both $p > 0.3$).

Functional outcomes improved in cases without marked progression of coronal deviation.

Conclusions: Volar silicone arthroplasty for the Proximal Interphalangeal Joint Osteoarthritis can maintain alignment and functional improvement when the preoperative coronal deviation is $< 20^\circ$ and the collateral ligament can be preserved. Deviation $\geq 20^\circ$ predicts postoperative failure and should prompt reconsideration of the surgical strategy.

A-0180 OBJECTIVE ELECTROPHYSIOLOGICAL EVALUATION OF REINNERVATION AFTER SIDE-TO-END AIN TRANSFER USING THE AIN-SETS PROTOCOL

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Background: Side-to-end anterior interosseous nerve (AIN) transfer is a promising adjunct procedure for motor recovery in advanced cubital tunnel syndrome. However, objective evaluation of its efficacy remains limited. Existing studies primarily rely on patient-reported outcomes such as key pinch strength or DASH scores, or on conventional nerve conduction studies (NCS) that cannot distinguish the effects of AIN transfer from standard ulnar nerve decompression.

Methods: To address this gap, we developed a novel electrophysiological assessment tool, the AIN-SETS protocol, which directly evaluates reinnervation of intrinsic hand muscles via the median nerve after AIN transfer. Since February 2024, we

have applied this protocol to all postoperative follow-ups in patients undergoing SETS AIN transfer. A total of 13 patients were assessed using this method, which involved stimulating the median nerve and recording CMAPs from both the first dorsal interosseous (FDI) and abductor digiti minimi (ADM) muscles.

Results: Among the 13 patients, 4 demonstrated reproducible CMAP signals from the median nerve to the FDI muscle, with significantly greater amplitudes in FDI compared to ADM. These findings strongly suggest selective and effective reinnervation of the FDI via the transferred AIN. Such signals were not detectable using standard ulnar NCS, highlighting the specificity of the AIN-SETS protocol.

Conclusion: The AIN-SETS protocol offers a novel and objective method to assess true motor reinnervation following SETS AIN transfer, overcoming the limitations of previous outcome measures that were either subjective or non-specific. These early results support the utility of this protocol as a precise tool for evaluating peripheral nerve transfer efficacy in clinical and research settings.

A-0181 BEYOND BODY MASS INDEX: APPENDICULAR LEAN MASS INDEX–DEFINED SARCOPENIA AND CARPAL TUNNEL SYNDROME — A CROSS-SECTIONAL ANALYSIS

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Introduction/Aims: Carpal tunnel syndrome (CTS) is the most common peripheral entrapment neuropathy of the upper extremity. Although obesity has been consistently associated with CTS, little is known about the contribution of muscle loss. We aimed to investigate the association between sarcopenia and CTS.

Methods: We retrospectively analyzed 214 consecutive patients over 40 years of age who underwent carpal tunnel release by a single surgeon at a tertiary center during a 4-year period. An age-matched control group of 6,714 participants from the Korea National Health and Nutrition Examination Survey (2022–2023) was included. Body mass index (BMI) and sarcopenia, defined using the Appendicular Lean Mass Index (ALMI), were compared between groups. Multivariable logistic regression was applied to examine independent associations with CTS.

Results: CTS patients showed significantly higher BMI and higher prevalence of sarcopenia compared with controls. Obesity was more evident in younger patients, whereas sarcopenia predominated in older patients. In multivariable models, both BMI (OR 1.1, 95% CI 1.07–1.15) and sarcopenia (OR 2.3, 95% CI 1.7–3.0) were independently associated with CTS. However, among CTS patients, disease severity was not significantly associated with body composition measures.

Discussion: These results indicate that CTS is associated not only with obesity but also with muscle loss. Sarcopenia may contribute to the pathophysiology of CTS beyond conventional metabolic factors, underscoring the importance of assessing muscle health in CTS risk evaluation.

A-0182 THE YIELD OF POST OPERATIVE CLINICAL FOLLOW-UP FOLLOWING MINOR HAND SURGERY, IS A FACE-TO-FACE ENCOUNTER NECESSARY?

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Introduction: Postoperative clinical follow-up is standard practice for wound monitoring, patient reassurance, and surgical outcome assessment. However, overburdened healthcare systems necessitate optimized resource allocation.

Aim: To evaluate the utility of routine postoperative follow-up after elective, non-infectious soft tissue upper limb procedures.

Material & Methods: We retrospectively reviewed patients aged ≥ 18 years who underwent elective soft tissue procedures between January 2023 and December 2024, including carpal tunnel, trigger finger and de Quervain's tenosynovitis release, foreign body removal, and excision of skin and subcutaneous finger and palm masses. Medical records were analyzed for interventions performed during routine postoperative visits and unplanned procedure-related encounters.

Results: Of 394 patients meeting inclusion criteria (mean age 57.7 ± 17.8 years; 42% male), mean time to follow-up was 22.2 ± 6.1 days. Only 12 routine visits (3%) yielded clinically significant interventions: five for wound complications, four for specific therapy instructions, two for postoperative neuropraxia, and one for severe pain management. Twenty-two surgical site infections and wound complications were reported. Most (77.3%) were identified and managed before the scheduled visit through emergency department or primary care encounters. Ninety-nine patients (25.1%) declined follow-up; of these, 83 required no additional surgical or medical care and 16 were lost to follow-up. Twenty-nine patients used the visit to raise unrelated new complaints.

Conclusions: Routine postoperative follow-up after elective, clean, soft tissue procedures proved beneficial in only 3% of cases, with most complications presenting through alternative care pathways. Further research should examine patient safety and satisfaction outcomes with voluntary, on-demand postoperative follow-up models.

A-0183 COMPARISON OF SURGICAL TREATMENT FOR CARPAL TUNNEL SYNDROME WITH CORTICOSTEROID INJECTION AND PLATELET-RICH PLASMA INJECTION

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Introduction: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy of the upper extremity, caused by compression of the median nerve at the wrist. Although both conservative and surgical interventions are widely used, there is no consensus on the optimal treatment approach for mild-to-moderate CTS. Minimally invasive injection therapies such as corticosteroid (CS) and platelet-rich plasma (PRP) injections are increasingly preferred, yet their long-term efficacy compared to surgical decompression remains controversial.

Aim: This study aimed to compare the clinical, electrophysiological, and ultrasonographic outcomes of surgical decompression, ultrasound-guided CS injection, and ultrasound-guided PRP injection in patients with mild-to-moderate CTS.

Material & Methods: A prospective randomized controlled study was conducted between January 2022 and January 2023, including 68 patients (92 wrists) diagnosed with mild-to-moderate CTS confirmed by electromyography. Patients were randomized into three treatment groups: (1) surgical decompression performed under the wide-awake local anesthesia no tourniquet (WALANT) technique, (2) ultrasound-guided CS injection using 1 mL triamcinolone 40 mg/mL, and (3) ultrasound-guided PRP injection prepared from 10 mL autologous venous blood. Clinical assessments included the Visual Analog Scale (VAS) and Boston Carpal Tunnel Questionnaire (BCTQ), while electrophysiological parameters—sensory nerve conduction velocity (SNCV), distal motor latency (DML), sensory nerve action potential (SNAP), and compound muscle action potential (CMAP)—and ultrasonographic measurements (cross-sectional area [CSA], flattening ratio [FR])

were recorded at baseline and at 1-, 3-, and 6-month follow-ups. Statistical analyses were performed using appropriate parametric and non-parametric tests, with significance set at $p < 0.05$.

Results: All three treatment groups showed significant improvements in pain and function according to VAS and BCTQ scores ($p < 0.05$). The surgical decompression group demonstrated the most pronounced and sustained improvements at all follow-up intervals. Electrophysiologically, significant recovery in SNCV and DML was observed in the surgical group at 3 and 6 months, whereas CMAP amplitude remained stable across groups. Ultrasonographic evaluation revealed a significant reduction in median nerve CSA at the first month in all groups, while FR values did not change significantly. No major procedure-related complications such as nerve injury, infection, or hematoma occurred in any group.

Conclusions: Both corticosteroid and PRP injections provide effective short-term symptom relief in mild-to-moderate CTS; however, surgical decompression under WALANT offers superior and more durable outcomes in both clinical and electrophysiological parameters. Ultrasound-guided injections are safe and minimally invasive, making them reasonable first-line options for selected patients. Nevertheless, surgical release remains the gold standard for persistent or recurrent CTS. Future studies with standardized PRP preparation protocols and longer follow-up are necessary to further clarify the long-term efficacy of regenerative injection therapies in median nerve entrapment.

A-0185 FUNCTIONAL OUTCOME AFTER EXTENSOR INDICIS PROPRIUS TO EXTENSOR POLLICIS LONGUS TENDON TRANSFER FOR RUPTURES FOLLOWING DISTAL RADIUS FRACTURES

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Introduction: Rupture of the extensor pollicis longus (EPL) tendon is a well-known complication after distal radius fracture (DRF) that hampers thumb extension. Transfer of the extensor indicis proprius (EIP) tendon to the EPL is a common reconstructive procedure, but prospective outcome data are limited.

Aim: To evaluate functional and patient-reported outcomes after EIP-to-EPL tendon transfer following DRF.

Material & Methods: Thirty patients (26 women; mean age 59 years, range 17–80) who underwent EIP-to-EPL transfer between 2021 and 2025 for EPL rupture secondary to DRF, were included. Thumb motion, grip and pinch strength, and QuickDASH scores were measured at 3 and 6 months postoperatively.

Results: At six months, mean height of lift-off test reached 65.6% (SD 33.7) of the contralateral side, and total thumb flexion 83.6% (SD 14.2). Grip strength recovered to 79% and pinch strength to 79–86% of the uninjured hand. Mean QuickDASH improved significantly from 28.6 to 20.6 points ($p = 0.015$).

Conclusions: EIP-to-EPL tendon transfer restores thumb motion and grip strength after satisfactory EPL rupture associated with DRF.

A-0186 EXPERT CONSENSUS CRITERIA FOR TECHNICAL PERFORMANCE AND QUALITY ASSESSMENT IN SUPERCHARGING END-TO-SIDE NERVE TRANSFERS: A DELPHI STUDY

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Introduction: Supercharging End-to-Side (SETS) nerve transfers are intended to augment distal muscle innervation in the setting of proximal nerve injury, safeguarding motor end-plates while native axons regenerate. Despite growing use, there is no unified operative technique, agreed anatomical terminology, or accepted benchmark for technical quality. We sought to define expert-derived criteria for assessing the quality of SETS transfers in the Anterior Interosseous Nerve (AIN) to Motor Ulnar Nerve (MUN) construct and to propose a structured performance grading matrix.

Aim(s):

1. Establish expert agreement on key quality indicators
2. Standardise anatomical terminology for the AIN-to-MUN transfer
3. Define the essential and reproducible procedural steps
4. Validate a novel performance grading matrix to evaluate technical outcomes.

Material & Methods: A three-stage Delphi study was conducted with an international panel of peripheral nerve experts. Two iterative rounds of structured questionnaires were used to establish consensus on quality-defining criteria for SETS AIN-to-MUN transfers (agreement threshold $\geq 70\%$). A final consensus session using moderated discussion and live polling categorized criteria as primary or secondary, confirmed the key procedural steps constituting the SETS technique, standardized anatomical nomenclature, and endorsed a proposed performance grading matrix.

Results: Experts were recruited via the Global Nerve Foundation based on clinical experience with the SETS AIN transfer. Consensus (100%) was achieved on anatomical nomenclature. Seven quality-defining criteria were established: Primary - tension at coaptation site, correct SETS position in motor fascicle group, absence of fascicle extrusion at inset, avoidance of recipient transection, and adequate interfascicular epineurium dissection. Secondary criteria were size of the epineural window and suture depth placement.

Common practices included use of 9/0 nylon sutures under magnification for neurorrhaphy, fibrin glue as an adjunct and immobilization for a median of 21 days.

Dissection of Guyon's canal and intraoperative nerve stimulation were considered optional.

Conclusions: This Delphi study presents the first expert consensus criteria for assessing technical quality in SETS AIN-to-MUN transfers, alongside standardized terminology and a grading matrix. These tools aim to guide surgical practice, facilitate outcome comparisons, and support future studies evaluating SETS efficacy.

A-0187 COMPARISON OF 3D MOTION OF THE THUMB AFTER TRAPEZIOMETACARPAL FUSION AND IMPLANTATION OF PYROCARBON

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Introduction: There are different surgical treatment options for trapeziometacarpal (TMC) osteoarthritis. TMC fusion and pyrocarbon interposition arthroplasty is performed in manual laborers, because they allow higher loads of the thumb compared to other treatments. However, these surgical methods have not yet been studied in-depth with regard to their effects on thumb kinematics and grip strength.

Aim: The aim of the study is to compare the functional outcome after surgical treatment of TMC osteoarthritis between patients with TMC fusion or Pyrocarbon implant.

Material & Methods: Age- and sex-matched patients' group after TMC fusion (n=8) and implantation of Pyrocarbon (n=7) were investigated subjectively and clinically (median 48.0 range 31-69 years; 2 females, 13 males). In addition, grip strength and thumb kinematics during basic motions and daily activities were measured in a 3D motion analysis lab with 20 infrared cameras to measure light-reflective skin markers to collect the kinematic data of the hand. To evaluate the kinematic data, the lab-internally developed Matlab analysis routine is used. Subjectively the patients were evaluated using the Michigan Hand Questionnaire (MHQ).

Results: Motion of the first metacarpal (includes TMC and STT joint motion) in patients after TMC fusion was as expected slightly more reduced compared to patients after Implantation of Pyrocarbon. Median flexion range of motion (ROM) in the metacarpophalangeal (MP) joint was 76° (range 66°-107°) in the fusion group compared to 73° (range 53°-88°) in the Pyrocarbon group. Thumb flexion was comparable between the two groups, but patients with Pyrocarbon implant showed a better opposition. Motion of the tip of the thumb showed no significant difference neither during basic motion tasks nor during ADL's. Summarized over all ADL, the fusion patients achieved 88% and the Pyrocarbon patients 99% of the force of their contralateral hand, median 4.05Nm (range 1.47-5.13Nm) and 3.68Nm (range 2.39-5.47Nm) respectively. When opening a bottle, the patients with a Pyrocarbon implant showed significantly more force; in all other tasks similar force values were achieved. Median MHQ score (Fusion 92, Pyrocarbon 88) showed no statistically significant difference.

Conclusions: Despite the fusion of the TMC joint, the patients have the good circumduction and opposition of the thumb due to the compensation in the MP joint. Patients after Pyrocarbon implantation achieved a more natural pinch grip position, while the fusion patients showed a compensatory increased MCP flexion during the ADL. Both patients' groups achieved almost the same force as in the contralateral healthy hand. Fusion of the TMC joint and implantation of Pyrocarbon are good treatment options in manual laborers regarding restoration of grip force and adequate thumb kinematics.

A-0188 THE ABERDEEN EXPERIENCE OF LEAN AND GREEN WARD-BASED CARPAL TUNNEL SURGERY: A SAFETY AND EFFICIENCY AUDIT

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Introduction: Carpal Tunnel Decompression (CTD) is the most commonly performed hand surgery in the UK. Increasing demand, limited theatre access, and NHS sustainability goals have led to an increase in the adoption of ward-based CTDs across the UK.

Aim: This audit aimed to evaluate the safety, efficiency, and environmental impact of CTDs performed in theatre versus the ward (Department of Scheduled Admissions, DOSA) in NHS Grampian.

Material & Methods: A total of 279 patients meeting inclusion criteria underwent CTD under local anaesthetic between August 2023 and April 2025 (150 in theatre, 129 on DOSA). Infection rates were analysed across all patients. Additional evaluations included operative time (n=38 DOSA, n=41 theatre), staffing (n=91), adherence to BSSH out-of-theatre guidelines (n=40), patient questionnaires (n=27), and waste output (n=4 cases). Statistical analysis used Fisher's Exact Test and Clopper-Pearson confidence intervals.

Results: Infection rates were low and not significantly different between cohorts: 2.00% (3/150) in theatre vs 1.55% (2/129) in DOSA (p=0.95). All infections were superficial or suture abscesses; no deep infections were reported. Patients in DOSA had shorter hospital stays (mean 2.15 vs 4.40 hours), lower staff numbers (mean 3 vs 9 per procedure), and equivalent operative duration (13.6 VS 15.3 minutes). Questionnaire feedback (n=16 DOSA, n=11 theatre) showed greater patient satisfaction and lower perceived wait times in DOSA. All patients reported symptomatic improvement. Waste produced per case was also lower in DOSA (2.10kg vs 2.99kg). Full compliance with BSSH safety standards was achieved on ward-based lists.

Conclusions: Ward-based CDs are safe, efficient, and align with environmental sustainability targets. Comparable infection outcomes, shorter stays, reduced staffing needs, and positive patient feedback support expanding ward-based CTD as a viable alternative to theatre-based procedures.

A-0189 PROXIMAL INTERPHALANGEAL JOINT SURFACE REPLACEMENT ARTHROPLASTY USING THE WALANT TECHNIQUE BY VOLAR APPROACH

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Introduction: Osteoarthritis of the proximal interphalangeal joint (PIPJ) is a common condition characterized by pain, weakness, stiffness, malalignment, and loss of movement in the affected hand. Conservative treatments such as medication, physical therapy, and splinting, as well as surgical procedures like synovectomy and debridement, may occasionally help; however, arthrodesis and proximal interphalangeal joint (PIPJ) arthroplasty are the definitive surgical options. The goal of replacement arthroplasty is to relieve pain, restore movement, and maintain the stability of the affected joint. Designing an effective replacement arthroplasty requires a deep understanding of current biomaterials and an appreciation for the complex biomechanics of the PIP joint. The use of local anesthetic (wide awake local anesthesia non-tourniquet - WALANT) offers advantages such as the absence of discomfort from a tourniquet, reduced personnel and sedation costs, faster recovery, and intraoperative assessment of motor function.

Aim: Our aim is to determine whether the WALANT technique is safe and effective in the context of PIPJ arthroplasty.

Material & Methods: A 36-year-old male patient reports that 9 months prior to his evaluation sustained trauma to the fourth right hand finger after this incident, he began to experience constant pain localized in the proximal interphalangeal joint along with deformity and difficulty achieving full flexion and extension.

Range of motion is limited, flexion 70 degrees and extension -2 degrees, exhibiting a varus deformity.

A radiographic study shows ulnar deviation of the middle phalanx and osteoarthritis signs.

A surface replacement arthroplasty of the proximal interphalangeal joint through a volar approach of the finger was performed, we began with the administration of local anesthetic using the WALANT technique

The procedure was completed without immediate complications, allowing for early mobilization of the joint. Trans and Postoperative dynamic radiographs were performed to rule out malalignment, with all results being negative. One year after the surgery the movement of the PIP joint allows 90 degrees of flexion and total extension without pain and no deformity.

Results: The use of local anesthesia (WALANT), which is a combination of lidocaine with adrenaline is safe and allow the patient and the surgeon to know immediately the range of movement achieved with the surgery demonstrating the benefits obtained.

The use of volar approach for this kind of arthroplasty is safe and allow earlier mobilization of the joint.

Conclusions: The Proximal Interphalangeal Joint Surface replacement arthroplasty using the WALANT technique by volar approach is a safe way to perform arthroplasty of the PIP joint wich allows early mobilization of the finger with good results.

A-0190 OPEN REDUCTION AND INTERNAL OSTEOSYNTHESIS IN HUMERUS HEAD FRACTURES

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Introduction: Open reduction and internal fixation (ORIF) with locking plates is widely selected for proximal humerus fractures' operative treatment in skeletally mature patients as such fractures predominantly affect elderly patients and often result from low-energy trauma. Effectiveness, long-term clinical results and prognostic factors influencing the outcome continue to be debated especially in complex fracture patterns for which reverse shoulder arthroplasty is gaining popularity.

Aim: To evaluate healing rates, functional outcomes, and complication incidence following ORIF using anatomic locking plates for Neer type II–IV proximal humerus fractures, and to identify prognostic factors associated with improved post-operative results.

Material & Methods: A retrospective review was conducted including 72 patients (52 females, 20 males; mean age 65.8 years, range 45–82) who underwent ORIF between 2012–2023. All cases were treated via a deltopectoral approach using anatomical locking plates. Patients with pathological fractures, previous ipsilateral shoulder surgery, and <12-month follow-up were excluded. Mean follow-up was 32.4 months. Fracture complexity (according to Neer classification), radiological union, complications, and age influence on outcomes evaluated using the Oxford Shoulder Score (OSS) and quickDASH (qDASH) were analyzed.

Results: Adequate fracture healing was achieved in 90.3% (65/72). Mean functional scores were OSS 53.4 (range 44–60) and qDASH 20 (range 5–44). Superior functional recovery was observed in younger patients (<70 years) and in 2-part fractures compared with 3- or 4-part injuries. Overall complication rate was 13.8% (10/72) including avascular necrosis in 4 patients requiring conversion to reverse arthroplasty or hemiarthroplasty, superficial infection in 3 cases successfully treated with IV antibiotics, and 3 malunions associated with limited abduction. No cases of implant failure or neurovascular injury were recorded.

Conclusions: ORIF with anatomical locking plates is a reliable treatment choice for proximal humerus fractures, providing high union rates and favorable functional outcomes, especially in younger individuals and less complex patterns. Careful patient selection and meticulous surgical technique are essential to reduce complications such as avascular necrosis and malunion.

A-0192 ARTHROSCOPIC RESECTION OF THE PROXIMAL CAPITATE WITH TENDON INTERPOSITION FOR ISOLATED CAPITULUNATE OSTEOARTHRITIS: A RETROSPECTIVE SERIES OF SIX CASES

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Introduction : Isolated capitulunate joint osteoarthritis is a rare condition with a poorly understood pathophysiology. To avoid midcarpal arthrodesis in active patients, we propose arthroscopic resection of the proximal pole of the capitate with tendon interposition (arthroscopic capitulunate tendinous interposition [ACLTI]). This study aimed to present the outcomes of patients after undergoing ACLTI.

Methods: This retrospective, single-center study included six patients with isolated capitulunate osteoarthritis who underwent capitate resection combined with ACLTI. The mean follow-up period was 89.3 months. Assessments included the visual analog scale score for pain, joint range of motion, grip strength, Patient-Rated Wrist Evaluation (PRWE) score, and Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) score. A descriptive and comparative preoperative and postoperative analysis was conducted.

Results: The postoperative results showed substantial improvement in the median pain scores, with a visual analog scale score of 0/10 compared with 5/10 before surgery. The mean PRWE score improved to 17.2 ± 14.2 , QuickDASH score to 21.5 ± 6.5 , extension to $74.2^\circ \pm 11.1^\circ$, flexion to $70^\circ \pm 13.8^\circ$, and grip strength to 25 ± 9.5 kg. No complications were reported.

Conclusions: Arthroscopic resection of the proximal capitate with tendon interposition appears to be an effective therapeutic option for active patients with isolated capitulunate osteoarthritis. This approach does not preclude the possibility of secondary arthrodesis in case of failure.

A-0193 ENTRUSTABLE PROFESSIONAL ACTIVITIES (EPAS) IN HAND THERAPY – DEVELOPING A STRUCTURED APPROACH FOR EDUCATION, ONBOARDING, AND INTERPROFESSIONAL COLLABORATION

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Background / Aim: In many clinical settings, hand therapists have taken on responsibility for wound management as part of their professional role. However, the knowledge and skills required for this task are not systematically taught in undergraduate occupational or physical therapy curricula. To ensure safe and effective on-the-job learning and clinical practice, the development and definition of Entrustable Professional Activities (EPAs) for wound management in hand therapy were initiated. EPAs are defined as holistic, profession-specific tasks that integrate multiple competencies (Hennus et al., 2023).

Methods: In an interprofessional setting within an acute care hospital, competencies, workflows, and responsibilities related to wound assessment and treatment performed by hand therapists were jointly discussed and defined by physicians, wound care specialists, and hand therapists. Based on this collaborative process, an EPA cluster for wound management was developed, reflecting key activities and the required knowledge, skills, and professional attitudes.

Results: The resulting EPA cluster comprises five key areas: (1) wound assessment, (2) therapy planning, (3) wound treatment and dressing application, (4) hygiene and infection control, and (5) interprofessional collaboration. Each EPA integrates relevant clinical tasks with corresponding competencies and entrustment levels. The development process highlighted the value of shared professional reflection and role clarification between disciplines, improving mutual understanding and standardization of practice.

Conclusion: The EPA cluster developed for wound management by hand therapists provides a valuable framework to enhance interprofessional communication, support the onboarding of new staff, and guide the education of students in hand therapy. The next step will be to evaluate its implementation in clinical practice and refine it as needed. Furthermore, there are plans to extend the EPA framework to additional areas of hand therapy, such as orthotic fabrication.

Hennus, M. P., Jarrett, J. B., Taylor, D. R., & Ten Cate, O. (2023). Twelve tips to develop entrustable professional activities. *Medical teacher*, 45(7), 701–707. <https://doi.org/10.1080/0142159X.2023.2197137>

A-0194 SUTURE-BUTTON SUSPENSIONPLASTY FOR THUMB CARPOMETACARPAL ARTHRITIS: COMPARISON BETWEEN ARTHROSCOPIC AND OPEN PARTIAL TRAPEZIECTOMY

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Introduction: Suture-button suspensionplasty (SBS) is a minimally invasive surgical technique for thumb carpometacarpal (CMC) arthritis that does not require tendon harvesting and has been reported to yield favorable clinical outcomes. Since its introduction, SBS has become the standard procedure in our institution. However, the method of trapezium resection varies depending on the surgeon's preference. The arthroscopic approach offers the advantages of minimal soft-tissue invasion, whereas the open approach provides a wider surgical field that facilitates trapezial bone resection. Direct comparisons between the two approaches remain limited.

Aim: The purpose of this study was to retrospectively compare the clinical and radiographic outcomes of arthroscopic partial trapeziectomy followed by SBS (arthroscopic group) and open partial trapeziectomy followed by SBS (open group) for patients with thumb CMC arthritis.

Materials & Methods: Patients who underwent surgery for Eaton stage II or III thumb CMC arthritis between 2017 and 2023 were reviewed retrospectively. Those with collagen diseases or revision cases were excluded. A total of 40 thumbs in 40 patients with a minimum of 12 months of follow-up were analyzed. The arthroscopic group included 24 thumbs (5 men, 19 women; mean age, 70 years), and the open group included 16 thumbs (3 men, 13 women; mean age, 71 years). In both groups, partial trapeziectomy was performed to restore CMC joint mobility, and fixation between the first and second metacarpals was achieved using the Mini TightRope® CMC (Arthrex Inc., Naples, FL, USA). Clinical and radiographic outcomes were compared between the preoperative and 1-year postoperative periods, as well as between the two groups at 1 year postoperatively. Postoperative assessments included pain visual analog scale (VAS), grip strength, key pinch strength, and Kapandji score. Radiographic evaluation included trapezial bone resection amount, trapezial space ratio, and postoperative dorsal and radial subluxation rates.

Results: VAS pain scores improved significantly in both groups (arthroscopic: 69→9; open: 67→11; $p<0.001$). No significant differences were observed in grip strength, key pinch strength, or Kapandji scores before and after surgery in either group. The operative time was significantly longer in the arthroscopic group (mean 105 min) than in the open group

(mean 58 min) ($p < 0.001$). The mean amount of trapezial bone resection was smaller in the arthroscopic group (2.0 mm) compared with the open group (4.7 mm) ($p < 0.001$). The trapezial space ratio remained nearly unchanged in the arthroscopic group (0.39→0.38) but significantly decreased in the open group (0.37→0.30) ($p < 0.001$). Postoperative dorsal and radial subluxation rates of the CMC joint did not differ significantly between the two groups (arthroscopic: 0.15/0.02; open: 0.17/0.05).

Conclusions: Clinical outcomes were favorable, with no significant differences between the two groups. Although the arthroscopic group required a longer operative time, it demonstrated superior maintenance of the trapezial space. This is likely attributable to the smaller amount of bone resection and the minimal soft-tissue invasion associated with the arthroscopic approach.

A-0195 MID-TERM OUTCOMES OF THE NOTTINGHAM PALMAR PLATE ARTHROPLASTY FOR METACARPOPHALANGEAL JOINT OSTEOARTHRITIS

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Introduction: A soft tissue interposition technique referred to as the Nottingham Palmar Plate Arthroplasty for Metacarpophalangeal joint (MCPJ) osteoarthritis, demonstrated promising mid-term outcomes in the original small case series. Outcomes outside of Nottingham have not been reported.

Aim: To assess the overall outcomes and reproducibility of the Nottingham Palmar Plate Arthroplasty procedure in the treatment of non-inflammatory MCPJ arthritis.

Material & Methods: This is a retrospective review of 15 Nottingham Palmar Plate Arthroplasties in 12 patients. Patient Reported Outcomes Measures (PROMs) including Numerical Rating Scale for pain (NRS), Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) and the Patient Evaluation Measure part 2 (PEM2) were collected along with clinical outcomes.

Results: The median follow-up was 45 months (range 3-91). Final QuickDASH was 18 (2-82), PEM2 was 18 (2-77) and NRS for pain was 2/10 (0-7/10).

Comparative data were available for only 6 patients, with a median follow-up of 75 months (3-83). All measures improved: QuickDASH from 71 (59-75) to 14 (7-54) and PEM2 from 72 (63-77) to 13 (5-77). NRS for pain also improved from 8/10 to 1/10 at median follow-up 75 months (12-91). Improvements were sustained over time.

Outcomes were maintained in those patients with longer-term follow-up. In 9 fingers in 6 patients at median of 75 months (30-91) post-operatively; QuickDASH scores were 18 (2-55), PEM2 18 (2-77) and NRS for pain 0/10 (0-5/10).

No major complications or revisions occurred. Some patient demonstrated poorer subjective outcomes, but often had new or concurrent hand pathology as confounding factors.

Conclusions: The Nottingham Palmar Plate Arthroplasty for non-inflammatory MCPJ arthritis showed a substantial improvement in pain and hand function, even when performed outside of Nottingham. Subjective outcomes are as good or better than previously reported and were durable over time.

These results are comparable to silastic arthroplasty PROMs, and may avoid the associated expense. While promising, findings should be interpreted with caution due to the limited sample size, and wide data ranges.

A-0196 VALIDITY OF TENDON MORPHOMETRY USING FRACTURE MRI: A CADAVERIC COMPARISON

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Introduction: FRACTURE is an MRI sequence that provides CT-like bone contrast and was originally developed for high-contrast bone imaging, and has been reported to depict hand and wrist tendons as bright structures with clearly defined margins, facilitating their visualization. However, the validity of tendon morphologic measurements obtained from FRACTURE images remains unclear. The purpose of this study was to evaluate the validity and reproducibility of FRACTURE-based tendon morphometry using fresh-frozen cadaveric upper extremities as the reference standard.

Material & Methods: Six fresh-frozen cadavers (six upper limbs) were examined using a 3T MRI scanner with the FRACTURE sequence. A total of 24 flexor and extensor tendons were evaluated. For each tendon, five anatomical levels were assessed: the metacarpophalangeal (MCP) joint, mid-metacarpal level, carpometacarpal (CMC) joint, wrist level including the carpal tunnel, and distal forearm. At each level, maximum tendon diameter and tendon perimeter were measured on FRACTURE images. One observer performed two measurements, and another observer performed one measurement. Immediately after imaging, the same levels were identified by anatomical dissection, and direct anatomical measurements at the corresponding levels were obtained as the reference standard. Agreement between MRI-based and anatomical measurements was assessed using Bland–Altman analysis (mean difference and 95% limits of agreement). Intra-observer reproducibility was evaluated using the intraclass correlation coefficient (ICC[3,1]), repeatability coefficient (RC), and within-subject coefficient of variation (wCV%), and inter-observer reproducibility using ICC(2,1), all with 95% confidence intervals. **Results:** For maximum tendon diameter, Bland–Altman analysis demonstrated a mean difference of +0.24 mm, with 95% LoA from –1.06 to +1.54 mm across all tendons and measurement sites. For tendon perimeter, the mean difference was –0.23 mm, with 95% LoA from –2.02 to +1.55 mm. The LoA for extensor tendon perimeter (–2.11 to +1.56 mm) were slightly wider than those for flexor tendons (–1.93 to +1.73 mm), suggesting somewhat greater variability among extensors with flattened or irregular cross-sectional shapes. Intra-observer and inter-observer ICC values were uniformly high for maximum diameter and perimeter, whereas RC values were small and wCV% values were low, indicating excellent reproducibility and limited measurement error for FRACTURE-based assessments.

Conclusions: FRACTURE-based measurements of tendon morphology showed good agreement with anatomical reference values for both maximum diameter and perimeter, with 95% LoA of approximately ± 1.5 mm and ± 2.0 mm, respectively. These results suggest that FRACTURE provides sufficient accuracy and reproducibility for quantitative assessment of hand and wrist tendons and may be applicable to clinical situations requiring size selection in 1–2 mm increments, as well as to future studies using FRACTURE for quantitative assessment of tendon morphology.

A-0197 ARTHROSCOPIC TREATMENT OUTCOMES FOR SPORTS-RELATED SCAPHOID FRACTURES AND NONUNION

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Introduction: Scaphoid fractures are relatively common among upper limb injuries caused by sports trauma. Arthroscopic surgery offers direct visualization of the fracture site, enabling bone grafting and precise reduction assessment. It also

provides a minimally invasive approach for treating scaphoid nonunion.

Aim: This study aimed to evaluate the clinical outcomes of arthroscopic surgery for scaphoid fractures and nonunion resulting from sports-related trauma.

Material & Methods: Among 95 cases of sports-related scaphoid fractures and nonunion treated since 2001, 47 cases underwent arthroscopic surgery. These included 6 cases of acute fractures and 41 cases of nonunion. The average duration from injury to surgery in the nonunion group was 4.5 months (range: 2–18 months). We analyzed the type of sport involved and postoperative outcomes.

Results: Bone union was achieved in all cases. The average time to union was 8.0 weeks in the acute fracture group and 10.1 weeks in the nonunion group, with no significant difference between them. Final range of motion and Mayo Wrist Scores were favorable in both groups. The most frequent injury mechanism was soccer goalkeepers blocking shots (28%), which was associated with a higher incidence of proximal-type fractures.

Even in cases of proximal nonunion or displaced fractures such as humpback deformities, which are difficult to visualize from the midcarpal portal, arthroscopic management was feasible using radial and volar portals. The injury mechanism in goalkeepers likely involves palmar-directed force combined with shearing stress at the scaphoid fossa of the radius.

Conclusions: Scaphoid fractures and nonunion due to sports trauma were frequently observed in soccer players, particularly goalkeepers with proximal-type fractures. Arthroscopic surgery proved to be a valuable treatment option, offering minimally invasive intervention with early bone union and favorable postoperative outcomes.

A-0198 KEEPING THE BALANCE: TIMING, COMPLIANCE AND COMPLICATIONS AFTER FLEXOR TENDON ZONE I INJURY

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Introduction: Flexor tendon injury recovery is multifactorial and time-critical, with outcomes highly dependent on surgical timing, early rehabilitation, and patient adherence. This study examines postoperative complication rates following Zone I repair, exploring how timing and compliance influences outcomes.

Aim: Primary outcome: Incidence of postoperative complications (defined as infection, rupture, tenolysis) within 12 weeks of flexor tendon Zone I repair.

Secondary outcomes:

- Association between time to surgery and complication rate.
- Association between time to first hand therapy session and complication rate.
- Association between patient compliance and complication rate.

Material & Methods: A single-centre retrospective cohort study was conducted including all patients who underwent flexor tendon Zone I repair between January 2017 and November 2024 at a tertiary referral centre within the UK. Inclusion criteria: open or closed injury involving only flexor tendon zone I. Exclusion criteria: (1) multi-zone injury, (2) defined complication occurring prior to definitive surgical repair, (3) incomplete hand therapy appointment data.

Demographic and clinical data were extracted from electronic records and hand therapy databases, including age, sex, mechanism of injury, time to tendon repair post-injury, time to first hand therapy session post-surgery, compliance (non-compliance defined as not attending 1 or more clinic or hand therapy appointments) and complications (infection, rupture or tenolysis).

Time to tendon repair post-injury was dichotomised as ≤ 4 days or > 4 days. Time to first hand therapy session post-surgery was dichotomised as ≤ 5 days or > 5 days. Both timing variables were guided by BSSH flexor tendon injury recommendations.

Associations between timing variables, compliance, and complications were assessed using Chi-Squared.

Results: A total of 156 patients who underwent flexor tendon Zone I repair were identified between 2017 and 2024. After excluding 17 patients due to multi zone injury (n=13), missing hand therapy data (n=3) and complication proceeding definitive surgery (n=1), 139 patients were included in the final analysis. Median age was 37.1 years (range 16.0–68.0), with 80.0% male. Median time from injury to surgery was 3 days, with 73.4% receiving surgery in ≤ 4 days. Median time to first hand therapy session was 5 days after surgery, with 51.8% attending first hand therapy ≤ 5 days after surgery. 68.6% of patients were documented as showing evidence of non-compliance with outpatient attendance.

Postoperative complications occurred in 12.9% of patients, including infection (n=11), rupture (n=6), tenolysis (n=5) within 12 weeks of surgery. Patient non-compliance was associated with a higher complication rate ($p = 0.035$). No significant associations were found for time to surgery and time to first hand therapy. On further analysis, no significant association was found between individual infection, rupture or tenolysis rates and time to surgery, time to first hand therapy or patient non-compliance.

Conclusions: Successful flexor tendon recovery relies on balance between prompt surgical repair, early functional rehabilitation, and patient participation. Our findings reinforce that disruption to this through patient non-compliance, increases the likelihood of complications and impairs recovery potential.

A-0199 ACUTE SCAPHOID FRACTURE AT THE SITE OF A PRE-EXISTING SCAPHOID STRESS FRACTURE NONUNION: A CASE REPORT

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Introduction: Scaphoid stress fractures are rare injuries that typically occur in sports involving repetitive wrist extension. We report an extremely rare case of an acute scaphoid fracture caused by a fall, occurring at the site of a preexisting nonunion of a scaphoid stress fracture.

Aim: To describe a rare case of an acute scaphoid fracture at the site of a preexisting nonunion of a scaphoid stress fracture, including its clinical findings, management, and outcome.

Material & Methods: A 17-year-old right-hand-dominant male fell onto his outstretched left hand during a blocking motion in a school volleyball game. The patient visited a local clinic the following day, was diagnosed with a scaphoid fracture, and was referred to our hospital on the same day. Plain radiographs revealed a fracture line with sclerosis at the scaphoid waist and a scapholunate angle of 74° , consistent with a dorsal intercalated segment instability (DISI) deformity. Computed tomography (CT) showed a waist nonunion with sclerosis, cystic changes, and a humpback deformity, as well as a new acute fracture line at the proximal dorsal cortex. Magnetic resonance imaging (MRI) demonstrated bone marrow edema limited to the acute fracture site, with no edema at the nonunion and no evidence of avascular necrosis of the proximal pole. Although the patient had no prior history of trauma such as falls, he had been a member of the middle school tennis club and experienced left wrist pain during tennis that persisted for several months, which improved after he stopped playing tennis. Based on these findings, it was considered that a scaphoid stress fracture from tennis had progressed to nonunion, and that an acute scaphoid fracture had subsequently occurred as a result of the recent fall.

At 22 days post-injury, nonvascularized autologous iliac bone grafting and fixation with a double-threaded screw were performed through a palmar approach under general anesthesia.

Results: After 6 weeks of immobilization, range-of-motion exercises were initiated. Bone union was confirmed three months after surgery. At the final follow-up, the patient was pain-free, with wrist flexion of 90° and extension of 80° .

Grip strength was 27.1 kg on the right and 28.8 kg on the left, and he returned to sports without restriction. Conclusions: Scaphoid stress fractures are most frequently reported in gymnastics and badminton, while tennis-related cases are rare. To our knowledge, no previous reports have described an acute scaphoid fracture occurring at or adjacent to a preexisting stress fracture nonunion. Although the patient was right-hand dominant, the repetitive two-handed backhand motion likely caused a left scaphoid stress fracture that subsequently developed into a chronic nonunion. The acute fall appears to have precipitated an acute fracture at this site. Nonvascularized autologous iliac bone grafting with screw fixation achieved excellent outcomes; however, untreated nonunion may progress to scaphoid nonunion advanced collapse (SNAC). Given the low awareness of scaphoid stress fractures and their often mild symptoms, such injuries are easily overlooked. Education and awareness among athletes, coaches, and healthcare professionals are essential.

A-0200 A RARE COHORT: BALANCING TIMING, COMPLIANCE, AND COMPLICATIONS IN FLEXOR TENDON ZONE III INJURIES

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Introduction: Flexor tendon injury recovery is multifactorial and time-critical, with outcomes dependent on surgical timing, early rehabilitation, and patient adherence. Zone III injury is uncommon and therefore underreported. This study examines postoperative complication rates in a proportionately large cohort of repaired Zone III injuries, exploring how timing and compliance influences outcomes.

Aim: Primary outcome: Incidence of postoperative complications (defined as infection, rupture, tenolysis) within 12 weeks of flexor tendon Zone III repair.

Secondary outcomes:

- Association between time to surgery and complication rate.
- Association between time to first hand therapy session and complication rate.
- Association between patient compliance and complication rate.

Material & Methods: A single-centre retrospective cohort study was conducted including all patients who underwent flexor tendon Zone III repair between January 2017 and November 2024 at a tertiary referral centre within the UK. Inclusion criteria: open or closed injury involving only flexor tendon Zone III. Exclusion criteria: (1) multi-zone injury, (2) complication occurring prior to surgical repair, (3) incomplete hand therapy appointment data.

Demographic and clinical data were extracted from electronic records and hand therapy databases, including age, sex, mechanism of injury, time to tendon repair post-injury, time to first hand therapy session post-surgery, compliance (non-compliance defined as not attending ≥ 1 clinic or hand therapy appointments) and complications (infection, rupture or tenolysis).

Time to tendon repair post-injury was dichotomised as ≤ 4 days or > 4 days. Time to first hand therapy session post-surgery was dichotomised as ≤ 5 days or > 5 days. Both timing variables were guided by BSSH flexor tendon injury recommendations. Associations between timing variables, compliance, and complications were assessed using Fisher's Exact Test.

Results: A total of 32 patients who underwent flexor tendon Zone III repair were identified between 2017 and 2024. After excluding 2 patients due to multi zone injury, 30 patients were included in the final analysis. Median age was 32.5 years (range 17.0–77.0), with 80.0% male. Median time from injury to surgery was 3.5 days, with 66.7% receiving surgery in ≤ 4 days. Median time to first hand therapy session was 6 days after surgery, with 36.7% attending first hand therapy ≤ 5 days after surgery. 60.0% of patients were documented as showing evidence of non-compliance with outpatient attendance.

Postoperative complications occurred in 16.7% of patients, including rupture (n=3), tenolysis (n=2), infection (n=0), within 12 weeks of surgery. No significant associations were found for time to surgery, time to first hand therapy or patient compliance. On further analysis, no significant association was found between individual infection, rupture or tenolysis rates and time to surgery, time to first hand therapy or patient non-compliance.

Conclusions: In this cohort of flexor tendon Zone III injury, no significant associations were found between timing variables or patient compliance and complications. Although our cohort was large for Zone III injury, our findings may have been limited by insufficient sample size for robust statistical analysis.

A-0201 AN EXPLAINABLE, EVIDENCE-INFORMED ARTIFICIAL INTELLIGENCE PROTOTYPE FOR INDIVIDUALIZED PROGNOSIS IN HAND REHABILITATION AFTER ZONE II FLEXOR TENDON REPAIR

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Introduction: In rehabilitation following flexor tendon repair in Zone II, a balance must be achieved between protecting the repair and controlled movement. Various rehabilitation protocols have been developed to achieve this balance, and the literature indicates that different approaches can be effective. This situation also supports individualized protocol selection over a single best approach.

Aim: The aim of this study was to develop an explainable, artificial intelligence-supported model that provides patient-specific predictions for total active motion, functional discharge time, probability of early tendon rupture and tenolysis, and return to activity/sports.

Material & Methods: Evidence on rehabilitation after Zone II flexor tendon repair published between 2019 and 2025 was reviewed. Studies describing a rehabilitation protocol or reporting outcomes were included across randomized and observational designs, multicenter and single-center series, and professional guidance documents. From each source, variables available in routine care were abstracted: patient demographics; injury and repair configuration (flexor digitorum profundus and flexor digitorum superficialis status, core-strand count, presence of an epitendinous suture, and A2 pulley management); rehabilitation approach and the day therapy began; supervised therapy dose and home-exercise dose; and serial active and passive range of motion and pain. Where reported, ultrasound findings related to edema or adhesions and simple adherence indicators were noted. Outcome anchors were prespecified: functional discharge defined as achieving Strickland-Glogovac (PIP and DIP) Good 70-84% or Excellent 85% or more, together with improvement exceeding the QuickDASH minimal clinically important difference of about 12-15 points. Evidence statements were translated into explicit if-then rules and numeric ranges defining recovery windows, safe loading limits, and thresholds for early tendon rupture within the first 6 postoperative weeks and for tenolysis within 24 weeks. These rules were implemented as a transparent knowledge base and executed by an explainable, forward-chaining inference engine that maps patient and repair features to predictions; for each case, the engine records the fired rules and their direction of effect to provide case-level explanations. The approach was literature-taught and rule-based; no training on individual patient datasets was undertaken. Face validity (not formal validation) was checked using scenario-based runs on synthetic and semi-synthetic profiles.

Results: Patient-specific outputs were generated: total active motion at key therapy milestones; time to functional discharge; absolute risks of early tendon rupture within the first 6 postoperative weeks and of tenolysis within 24 weeks; and suggested windows for return to activity/sports. For each profile, case-level explanations were provided showing

how repair configuration, A2 pulley management, protocol choice and timing, and therapy dose contributed to each prediction. Internal validation consisted of scenario-based face-validity checks on synthetic and semi-synthetic profiles; outputs were displayed with uncertainty bands (e.g., 95% intervals) obtained by propagating literature-based ranges through the rule base, and error cases were logged for review.

Conclusions: Our results demonstrate that an explainable, evidence-informed AI prototype was developed that links repair configuration, A2 pulley management, rehabilitation protocol and timing, and therapy dose to transparent risks and timelines that may inform graded progression after Zone II repair.

A-0202 DEVELOPMENT OF AN ARTIFICIAL INTELLIGENCE SUPPORT MODEL FOR PREDICTING REHABILITATION OUTCOMES IN LATERAL EPICONDYLITIS

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Introduction: Lateral epicondylitis is a degenerative overload disorder at the common extensor origin, most commonly involving the extensor carpi radialis brevis. Functional improvement can be achieved by many patients through rehabilitation and various medical treatments. Therefore, effective and predictable rehabilitation is key to reducing pain and facilitating a gradual return to activity/sports.

Aim: The aim of this study was to develop an explainable, artificial intelligence-supported model that provides patient-specific estimates for three rehabilitation questions: time to clinically meaningful improvement on validated outcomes; the 12-month probability of escalation of care to injection or surgery; and suggested windows for graded return to activity/sports.

Material & Methods: A PRISMA-ScR-guided scoping scan of hand therapy and orthopedics literature and guidelines (2019-2025) was conducted. MEDLINE/PubMed and Embase were searched; sources describing conservative management of lateral epicondylitis with a rehabilitation protocol or reporting outcomes were included. From each source, typical recovery windows, event rates, and consistent effect directions were abstracted and translated into explicit if-then rules that prespecified model behavior. Candidate inputs reflected routine hand therapy: age and sex; symptom duration and limb dominance; activity and sport load; clinical provocation tests; pain-free grip strength measured by standardized dynamometry; PRTEE and QuickDASH; optional ultrasound features; orthosis or counterforce bracing; structured exercise dose and progression; and analgesic or other adjunct use. Pain-free grip was treated as reliable and responsive under standardized protocols, whereas ultrasound features were considered optional because their prognostic relationships were inconsistent across studies. Outcome anchors were prespecified: clinically meaningful improvement defined as exceeding the PRTEE MCID of about 7-11 points (0-100) and the QuickDASH MCID of about 12-15 points. Evidence statements were then encoded into numeric ranges and if-then rules defining recovery windows, safe loading limits, and thresholds for escalation of care within 12 months; the rules were implemented as a transparent knowledge base and executed by an explainable, forward-chaining inference engine that maps patient and load factors to predictions and records the fired rules and their direction of effect for case-level explanations. The approach was literature-taught and rule-based with no IPD training, and face validity (not formal validation) was checked on synthetic and semi-synthetic profiles.

Results: Patient-specific outputs were generated: estimated time to clinically meaningful improvement on patient-reported outcomes; the 12-month probability of escalation to injection or surgery; and suggested windows for graded return to activity/sports. For each case, case-level explanations were provided showing how symptom duration, occupational and

sport load, pain-free grip, orthosis use, and exercise dose contributed to the estimates. Internal validation consisted of scenario-based face-validity checks on synthetic and semi-synthetic profiles; outputs were displayed with uncertainty bands (for example, 95% intervals) obtained by propagating literature-based ranges through the rule base, and error cases were logged for review.

Conclusions: Our results demonstrate that an explainable, evidence-informed AI prototype was developed that links pain relief, load management, progressive exercise, and activity participation to transparent risks and timelines that may inform graded escalation and de-escalation in hand rehabilitation.

A-0203 RESEARCH TRENDS IN REHABILITATION FOR EXTENSOR TENDON INJURIES: A BIBLIOMETRIC ANALYSIS

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Introduction: Extensor tendon injuries are common and usually occur due to direct trauma, lacerations, and crushing. Rehabilitation following extensor tendon repair is a challenging process. Rehabilitation after surgery should ensure that function is regained without adhesions and joint stiffness. Surgical techniques and rehabilitation approaches applied after extensor tendon injuries have shown significant advances in recent years. Although studies on rehabilitation after extensor tendon repair are a subject of interest, no bibliometric analysis has been conducted to date on the rehabilitation of extensor tendon injuries.

Aim: The aim of this study was to conduct a bibliometric analysis to identify the current research status, development, and trends in the rehabilitation of extensor tendon injuries.

Material & Methods: The Web of Science articles on the subject. The most frequently Core Collection database was used to obtain used keywords were flexor tendon, publications for bibliometric analysis. The rehabilitation, tendon, flexor tendon repair, search strategy was as follows: "extensor tendon" AND "rehabilitation" OR "extensor tendon" AND "therapy" OR "extensor tendon injury" AND "rehabilitation" OR "extensor tendon injury" AND "therapy" OR "extensor tendon repair" AND "rehabilitation" OR "extensor tendon injury" AND "therapy" OR "mallet finger" AND "rehabilitation" OR "mallet finger" AND "therapy" OR "boutonniere deformity" AND "rehabilitation" OR "boutonniere deformity" AND "therapy" OR "swan neck deformity" AND "rehabilitation" OR "swan neck deformity" AND "therapy" OR "sagittal band rupture" AND "rehabilitation" OR "sagittal band rupture" AND "therapy". Limitation by "topic" instead of "all fields" to focus the search. In addition, only research articles and reviews were included. VOSviewer package program was used for bibliometric analysis of publications, years, countries, authors, author collaboration networks, institutions, journals, citations, references, and keywords.

Results: Of the 343 published articles, 321 were included in the study. The years 2021 and 2023 saw the highest number of publications (n=28). Hirth was the author who contributed most to rehabilitation research on extensor tendon injuries (n=10). Among the countries that produced the most publications, the United States (n=97) ranked first, and researchers affiliated with The University of Melbourne (n=11) published the most on this topic. The journal that published the most articles on the subject was the Journal of Hand Therapy (n=33). The most frequently cited article among rehabilitation studies on extensor tendon injuries was the study by Rodeo et al. (1993). The most frequently used keywords were 'extensor tendon', 'rehabilitation', 'mallet finger', 'tennis elbow', 'lateral epicondylitis', and 'hand therapy'.

Conclusions: Rehabilitation following extensor tendon injuries is an important research topic for hand therapists and surgeons. The large number of research articles and reviews published in this field demonstrates the interest of clinicians and researchers in these studies. This bibliometric analysis provides information on the subject to researchers who are

interested in it for the first time, as well as to researchers already working in this field. It is thought that the volume of literature on rehabilitation in extensor tendon injuries has increased in recent years and will continue to increase. Therefore, this bibliometric analysis needs to be updated at regular intervals.

A-0204 LIMITATIONS OF THE DISTAL AIN-TO-ULNAR MOTOR BRANCH NERVE TRANSFER FOR PINCH RESTORATION: A CASE SERIES

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Introduction: The distal anterior interosseous nerve (AIN) to ulnar motor branch transfer is widely adopted for intrinsic muscle reinnervation following high ulnar nerve injury. While it offers a short regeneration distance, its effectiveness in restoring full pinch function remains under debate.

Aim: This study critically evaluates functional outcomes in a series of patients who underwent this transfer.

Material & Methods: Eight patients with ulnar nerve injuries proximal to the upper third of the forearm underwent distal nerve transfer of the AIN branch to pronator quadratus (PQ) to the ulnar motor branch at wrist level, within a maximum of 9 months post-injury. Clinical follow-up included assessment of clawing, finger abduction/adduction strength (MRC grading), key pinch strength, and presence of Froment's sign.

Results: Finger abduction and adduction recovered to M4 in all but one patient, and mild clawing was corrected in seven cases. However, subterminal key pinch strength averaged only 0.8 kg, and Froment's sign remained positive in five of eight patients. No donor site morbidity was observed.

Conclusions: Recovery of intrinsic function indicates that the nerve transfer effectively reached the correct ulnar motor fascicles. However, consistently poor reinnervation of the first dorsal interosseous suggests it may be the least likely to receive sufficient regenerating axons. Our findings challenge the assumption that this transfer alone can restore functional pinch and suggest that combining it with a more distal, selective motor transfer—such as opponens to first dorsal interosseous—may be necessary for optimal outcomes.

A-0206 RECURRENT DISTAL POSTERIOR INTEROSSEOUS NERVE PALSY FOLLOWING PROBABLE NEURALGIC AMYOTROPHY: SUCCESSFUL SURGICAL MANAGEMENT WITH DECOMPRESSION AND DISTAL NERVE TRANSFER

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Introduction: Isolated palsy of the distal posterior interosseous nerve (PIN) is rare and may present spontaneously without clear etiology. Recurrence after initial recovery raises suspicion of neuralgic amyotrophy (Parsonage-Turner syndrome), particularly in the context of a post-infectious event.
Aim: We present a unique case of recurrent PIN palsy managed successfully with decompression and selective nerve transfer.
Material & Methods: A young woman presented with spontaneous paralysis of thumb extension, retroversion and abduction. Sonography showed no compressive pathology. Electroneuromyography demonstrated acute denervation of EPL, EPB, and APL, with pathological neurography of the PIN distal to the supinator canal. After 8 months of conservative treatment with hand therapy and no functional improvement, surgical decompression of the PIN in the supinator tunnel was performed. First signs of reinnervation appeared at 6 weeks, with full thumb range of motion at 3 months.
One year later, following a flu-like illness, the

patient developed progressive recurrence of thumb extension and abduction weakness, leading to complete paralysis within 6 months. Hand therapy failed. Sonography suggested possible compression, prompting surgical re-exploration. Intraoperatively, an hourglass deformity of the PIN distal to the supinator canal was identified. Given the nerve's poor appearance and uncertain prognosis, a distal nerve transfer was performed: the distal anterior interosseous nerve was coapted to the distal PIN through a dorsal approach via membrana interossea dissection, selectively reinnervating APL, EPB, and EPL.

Results: At 9 months postoperatively, the patient achieved full extension of the thumb at the CMC, MCP, and IP joints. Strength remains at M3. No complications were observed.

Conclusions: This case illustrates the potential for recurrence of spontaneous distal PIN palsy due to neuralgic amyotrophy, supported by post-viral onset and hourglass deformity findings. A combination of decompression and targeted distal nerve transfers provided a favorable functional outcome and represents a viable surgical strategy in recurrent cases with limited regenerative potential.

A-0207 NERVE TRANSFERS FOR RADIAL NERVE PALSY: CLINICAL RESULTS FROM A PROSPECTIVE CASE SERIES

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Introduction: Tendon transfers are the traditional approach for restoring function in radial nerve palsy, but they disrupt native biomechanics and limit functional refinement. Nerve transfers provide a physiological alternative that preserves joint mechanics and enables selective muscle reinnervation. This study presents the clinical outcomes of nerve transfers in patients with radial nerve palsy.

Aim: This study presents the clinical outcomes of nerve transfers in patients with radial nerve palsy.

Material & Methods: A prospective case series included six patients (aged 25–52 years) with radial nerve palsy, presenting 3 to 8 months post-injury. The following nerve transfers as proposed by Bertelli were performed: (1) distal branch of the pronator teres to the extensor carpi radialis brevis, (2) branch to the flexor carpi radialis to the posterior interosseous nerve, and (3) distal anterior interosseous nerve branch to the pronator quadratus to the distal PIN for selective reinnervation of APL, EPB, and EPL. Patients were followed for 15 months. Outcome measures included wrist, finger and thumb extension MRC grading, range of motion, donor site morbidity, and complications.

Results: All six patients regained active wrist extension, with a mean wrist extension of 62° and MRC grade 4 strength. Full finger extension with the wrist extended was achieved in all cases (MRC 4). Thumb extension at the CMC and IP joints was at -5 to 0°. At the MCP joint, four patients achieved full extension, while two showed an extension lag of 25°. No loss of donor function was observed; pronation and wrist flexion strength remained unchanged compared to preoperative status while no surgical complications occurred.

Conclusions: Distal nerve transfers offer reliable restoration of wrist, finger, and thumb extension in radial nerve palsy, with high functional recovery and preservation of donor site strength. These preliminary results support nerve transfers as a safe and effective alternative to tendon-based reconstruction. The study is ongoing, and larger case series as well as controlled comparisons with outcomes following tendon transfers are needed to further validate these findings.

A-0209 CURRENT CONCEPTS FOR NERVE-BASED PROCEDURES TO TREAT UPPER LIMB SPASTICITY

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Introduction: Upper-limb spasticity is a common and disabling consequence of upper motor neuron lesions such as stroke, traumatic brain injury, or cerebral palsy. When conservative measures and chemodenervation fail, surgical options are considered. Traditional orthopedic procedures correct fixed deformities but do not address the underlying neural cause of spasticity. Nerve-based procedures directly target pathological reflex circuits to achieve more selective and lasting tone modulation.

Aim: To summarize current concepts, indications, and outcomes of central and peripheral nerve-based procedures for the treatment of upper-limb spasticity.

Material & Methods: A narrative review of key publications on selective dorsal rhizotomy (SDR), contralateral C7 (cC7) transfer, hyperselective neurectomy (HSN), neurotomy (with or without repair), and novel nerve transfer strategies was conducted. Surgical techniques, physiological mechanisms, and functional outcomes were analyzed with focus on their anatomical rationale and clinical indications.

Results: Central approaches such as SDR and cC7 transfer provide broad tone reduction by modulating afferent and mixed spinal roots, improving function but lacking muscle specificity. Peripheral procedures, notably HSN, allow precise denervation of overactive motor fascicles while preserving voluntary strength and sensation. Complete neurotomy remains an option for non-functional limbs to facilitate care and posture. Emerging strategies such as neurotomy with immediate repair and distal nerve transfers aim to restore volitional control by reinnervating spastic muscles with non-spastic or volitional donor nerves.

Conclusions: Nerve-based procedures offer targeted, physiology-driven interventions that complement traditional orthopedic techniques. By addressing the neural source of hypertonia, these operations provide durable tone reduction and, increasingly, the possibility of restoring functional control in the spastic upper limb.

A-0210 HAND AND FINGER INJURIES IN MIXED MARTIAL ARTS: JIU-JITSU

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Introduction: Martial arts have been increasing in popularity as a sport promoting physical and mental fitness. Jiu-Jitsu is a relatively unknown martial art and combat sport that relies on grappling techniques such as throws, joint locks, chokeholds, and pinning positions to defeat an opponent. Its popularity has been increasing especially in the United States. Multiple injuries have been described but a study from 2024 found that hand and finger injuries were among the most common (78.6%). Grip strength is important in holding the kimono of the opponent, however since the moves require prolonged gripping, whole body balance is important in order to be effective and to prevent injury. The kimono used -the Gi- is a heavy garment. Used in Jiu-Jitsu, it may increase the risk of finger injuries due to fingers being trapped inside the Gi especially when the combatant loses balance.

Aim: The aim of this series was to determine the frequency, type, and severity of finger injuries in Jiu-Jitsu practitioners in southeastern US, and the association between use of the Gi and finger injuries.

Material & Methods: Eleven Jiu Jitsu and Mixed Martial Arts (MMA) gyms from the southeastern United States were polled. Thirty people responded to the survey. The survey included questions regarding age, experience level, style of Jiu

Jitsu, and number/severity/type of finger injuries. In addition, patients were asked to describe the mechanism of injury. Frequencies were determined. The association between use of the Gi and the occurrence of finger injuries was assessed using R (correlation coefficient) and significance with $p < 0.05$ as significant.

Results: Of the participants surveyed, 93% have injured their fingers. Respondents experienced an average of 4.6 finger injuries throughout their careers. Thirty-three percent of participants have chronic finger pain. The most common injury was incurred during an undefined scramble position (57% of participants). The most commonly injured finger joint was the PIP of the long finger and the DIP of the ring finger; These joints were injured in 40% of participants. Gi utilization was found to be positively associated with finger injuries ($R = 0.54$, $p = 0.001$). However, age and belt rank were not found to be correlated with finger injuries or time off work or training.

Conclusions:

- Most study participants have experienced at least one finger injury in Jiu-Jitsu.
- Use of the Gi together with suboptimal balance may significantly increase the risk for finger injury.
- This information can be used to optimize training and prevent hand injuries in this martial art.

A-0211 THE IMPACT OF LOCKING PLATE POSITION ON OUTCOMES OF SCAPHOID NONUNION: DEFINING THE CLINICAL SCAPHOID WATERSHED LINE

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Introduction: Locking plates (LPs) specifically designed for scaphoid fixation have recently shown favorable outcomes when combined with vascularized or non-vascularized bone grafts. However, since LPs are applied to the scaphoid surface, excessive prominence may cause impingement against the radial wall. A recent study proposed the concept of a scaphoid watershed line (SWL) and recommended placing the plate distal to this curvature change, but supporting clinical evidence remains scarce.

Aim: To clarify the relationship between plate position and postoperative wrist function and to define a clinically applicable reference for the scaphoid SWL.

Materials & Methods: We retrospectively reviewed 34 patients (34 hands) who underwent LP fixation for recalcitrant scaphoid nonunion between 2015 and 2025 at our institution and affiliated centers. Plate position on lateral radiographs was quantified as: RAPD (Radial Articular–Plate Distance): the distance from the most basal point of the radial articular surface to the proximal edge of the plate, and RPPD (Radial Palmar–Plate Distance): the distance from the palmar cortical edge of the distal radius to the proximal edge of the plate. Postoperative outcomes included wrist range of motion (ROM), grip strength, and Mayo Wrist Score (MWS). Using the median RAPD (2 mm) as a cutoff, patients were divided into RAPD < 2 mm and RAPD $\geq$ 2 mm groups for comparison.

Results: The mean age was 40.4 years, and the mean injury-to-surgery interval was 14.1 years; 17 cases had an interval of more than 10 years, and 10 cases were revision surgeries. Vascularized bone grafts were used in all cases. Intraoperative histology showed osteonecrosis in 63% of proximal fragments. Bone union was achieved in 33 of 34 cases (97.1%). The mean RAPD and RPPD were 1.8 ± 1.7 mm and -0.8 ± 1.8 mm, respectively. The RAPD < 2 mm group demonstrated significantly poorer postoperative outcomes than the RAPD $\geq$ 2 mm group: total flexion–extension arc = 107° vs 120° ($p = 0.03$), dorsal flexion = 61° vs 68° ($p = 0.02$), and MWS = 81 vs 87 ($p = 0.03$). No significant differences were found in age, injury-to-surgery interval, or grip strength. Receiver operating characteristic analysis using an MWS threshold of

80 yielded an optimal RAPD cutoff of 1.9 mm (AUC = 0.71, 95% CI 0.51–0.91). The RPPD showed no significant correlation with functional outcomes.

Conclusions: Clinical outcomes were inferior when the plate was positioned proximally within 2 mm of the radial articular surface. An RAPD ≥ 2 mm—indicating placement distal to the scaphoid watershed line—was associated with better wrist function and reduced impingement risk. Because this measurement can be easily verified intraoperatively under fluoroscopy, an RAPD of approximately 2 mm may serve as a simple and reliable radiographic landmark for optimal and functionally favorable LP fixation in recalcitrant scaphoid nonunion.

A-0212 EVALUATION OF SCAPHOLUNATE ADVANCED COLLAPSE (SNAC) WRIST TO PREDICT MIDCARPAL JOINT COLLAPSE AFTER EXCISION OF THE DISTAL POLE OF THE SCAPHOID

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Introduction: Excision of the distal pole of the scaphoid is a feasible surgical procedure to treat scaphoid nonunion advanced collapse (SNAC). An indeterminate proportion of patients treated with this technique develop midcarpal joint instability and arthritis. Since it is possible that wrist structure could affect the way a specific SNAC wrist would “respond” to excision of the distal pole of the scaphoid, we used a previously validated finite element model (FEM) of the wrist to study 2 clinical cases of failed distal scaphoid pole excision performed as treatment for early SNAC wrist.

Aim: Our purpose was to determine which structural parameters can predict midcarpal collapse of a SNAC wrist following excision of the distal pole using 2 clinical cases and a validated FEM.

Material and Methods: Three models based on CT scans were built and analyzed. Two were SNAC wrists treated with excision of the distal pole of the scaphoid and collapsed midcarpal joint. The third sample was a normal wrist. All three samples were type 1 wrists. A 200 N force was evenly split and applied to the dorsal crests of the trapezoid and capitate (100 N along each crest) to replicate the scenario of a person performing a push-up on their knuckles.

Pre-load angles between the bones (radio-scaphoid, scapholunate, lunate-capitate), post-load Von misses stresses and bone displacements were predicted by the model.

Results: Excision of the distal pole of the scaphoid increased displacement of all carpal bones in both normal and SNAC wrists. The clinical SNAC wrists demonstrated changes (from normal) in the intercarpal angles prior to surgery and dorsal capitate migration relative to the lunate. The distribution of stresses and direction of translation differed in the clinical cases from an intact wrist undergoing the same procedure and similar loading.

Conclusions:

- If there is already evidence of collapse (abnormal intercarpal angles) in a SNAC wrist, it is likely that excision of the distal pole of the scaphoid will increase midcarpal instability.
- A wrist type 1 seems to be more prone to midcarpal joint collapse following excision of the scaphoid distal pole.

A-0213 DORSIFLEXION CAST POSITION PREVENTS DISPLACEMENT IN COLLES' FRACTURE - A FINITE ELEMENT ANALYSIS STUDY

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Purpose: This study aimed to investigate the optimal cast immobilization position for the conservative treatment of Colles' fracture using finite element analysis (FEA).

Methods: Ten upper limbs obtained from ten cadavers were scanned with computed tomography in five palmar-dorsiflexion (V30, V15, DV0, D15, and D30). Colles' fracture models with comminuted dorsal cortex and intact volar cortical continuity were developed and subjected to FEA. Each position was assessed for fragment displacement, average minimum and maximum principal strain at the fracture site, and equivalent stress propagation direction.

Results: The minimum fragment displacement was observed at 15° of dorsiflexion. The differences in the distance between the dorsal fragments before and after loading in V30, V15, DV0, D15, and D30 were 1.05 ± 0.25 , 0.77 ± 0.23 , 0.50 ± 0.18 , 0.23 ± 0.18 , and 0.24 ± 0.11 mm, respectively, with D15 being the smallest. The minimum and maximum principal strains at the fracture site were minimal at D15. The equivalent stress propagation direction analysis revealed that forces were transmitted through the volar cortex at D15.

Conclusions: The FEA reveals that cast immobilization at 15° of dorsiflexion is optimal for the conservative treatment of Colles' fracture. This position prevents fracture displacement by minimizing the mechanical load at the fracture site.

Clinical Relevance: This study presents scientifically based optimal cast immobilization positions for the conservative treatment of Colles' fracture. These results could help improve patient care in clinical practice.

A-0215 A NOVEL DEVICE FOR THE OBJECTIVE ASSESSMENT OF THE SCRATCH COLLAPSE TEST FOR PERIPHERAL NERVE ENTRAPMENT

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Introduction: The scratch collapse test (SCT) assesses suspected peripheral nerve compression syndromes, such as at the carpal or cubital tunnels. First described in 2008, the test involves assessing a patient's bilateral shoulder external rotation against the resistance of the clinician's arms. This is followed by a light 'scratch' over the suspected area of nerve entrapment. A transient loss of muscle resistance felt by the clinician is a positive test, confirming the site of nerve compression [1]. Validation of the SCT has shown significant inter-observer and intra-observer differences [2,3].

Aim: Given the poor reproducibility and objectivity of the test, the author of this article has sought to develop a more objective method of performing the SCT.

Material & Methods: The author has developed a device to measure shoulder external rotation force over time to objectively observe for response to the SCT. The device incorporates a lever arm load sensor with a forearm rest, linked to a programmable microcontroller.

The microcontroller was then programmed to transmit data on the force recorded over time, before and after scratch provocation, which is represented graphically. An application is in development to streamline this process.

Results: With the completed device, it is possible to record the force generated over time from shoulder external rotation. This methodology of performing the SCT removes any clinician subjectivity and enables a more objective and reproducible

SCT. A protocol has been developed to describe a standardised SCT, and approval will be sought to test the device clinically and validate the specificity and sensitivity by reference to the gold standard of nerve conduction tests.

Conclusions: The clinical diagnosis of peripheral nerve entrapment of the upper limb relies on a wide range of assessments and expert interpretation of clinical history. Even with the range of clinical assessments available, diagnosis can be challenging, and nerve conduction studies remain the gold standard. If this device is a more objective method for performing the SCT and can be used to assess the sensitivity and specificity of the SCT, then it has the potential to clarify the utility of the SCT as a point-of-care test in making the diagnosis of peripheral nerve compression.

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A-0216 EFFECT OF BONE HEALING USING NOVOSIS (RHBMP-2 SOAKED HYDROXYAPATITE) IN SCAPHOID WAIST NONUNION

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Introduction: There are variety of graft options for scaphoid waist nonunion and the effect of vascularized versus non-vascularized bone graft is still with controversy. Both graft techniques leave substantial morbidity of donor site and elongation of operation time. Even graft-less fixation is a viable option but there is lack of compelling evidence that it would be sufficient for nonunion treatment.

Aim: The purpose of this study was to evaluate the clinical and radiological outcomes of scaphoid waist nonunion patients who underwent osteosynthesis using a hydroxyapatite-based alloplastic bony substitute with rhBMP-2.

Material & Methods: From Aug 2023 to Dec2024, we performed a retrospective study on a cohort of 7 scaphoid waist nonunion patients (6 males, 1 female) with a mean age of 30 (15 – 57) years. The mean time from injury to operation was 10.1 (3-24) months. The mean clinical and radiological follow-up period was 10 (6 - 14) months. Operative fixation was performed through a volar approach using 2 Arix headless compression screws (2.3 mm in diameter, Jeil Medical, Seoul, Korea) and hydroxyapatite-based alloplastic bony substitute with rhBMP-2(HA+rhBMP-2; NOVOSIS®, CGBio Inc., Korea) was grafted after decortication of nonunion site. Union was determined with plain radiographs and serial computed tomography. Clinical results were assessed through range of motion (ROM) of the wrist, the visual analogue scale (VAS), and Mayo wrist score.

Results: There were no adverse reactions or infections regarding graft material in all patients. All cases achieved complete bony union after operation. In general, all patients had favorable clinical outcomes in wrist ROM, VAS pain score, and Mayo wrist score. One patient had slight limitation in range of motion. One case received 2 HCS fixation with conventional auto-iliac bone graft as the primary operation after 18 months of injury. However, 1 screw loosening occurred after 9 months of operation with persistent fracture site nonunion. The case underwent removal of the loosened screw and Novosis graft on nonunion site and achieved complete bony union after 6 months of re-operation.

Conclusions: Osteosynthesis with HA+rhBMP-2 graft for nonunion of the scaphoid waist showed good clinical and

radiological outcomes without leaving any donor site morbidity. Postoperative complications related to the graft material did not occur. Thus, it is considered a good alternative option for scaphoid waist nonunion.

Key Words: Scaphoid nonunion, waist, Osteosynthesis, Novosis, rhBMP-2

A-0217 RADIOSCAPHOLUNATE AND RADIOLUNATE ARTHRODESIS – A BIOMECHANICAL STUDY

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Introduction: Partial radioscapholunate (RSL) and radiolunate (RL) wrist arthrodeses are well-established procedures for the treatment of radiocarpal osteoarthritis and post-traumatic or rheumatoid degeneration. Although both techniques show favourable clinical outcomes, biomechanical data enabling direct comparison are limited, particularly when surgical variations are considered, such as distal scaphoid resection in RSL or transection of the scapholunate ligament in RL.

Aim: This study aimed to compare wrist range of motion (ROM) across four configurations (RSL, RSL with distal scaphoid resection, RL, and RL with scapholunate ligament transection), to clarify their impact on restriction of wrist mobility, and to evaluate the influence of pre-operative ROM on postoperative motion loss. Specifically, we asked whether a wrist with greater pre-operative ROM loses proportionally more or less motion after partial wrist arthrodesis.

Material and Methods: Wrist ROM of fresh-frozen cadaveric specimens was measured in flexion–extension and radial–ulnar inclination. Subsequently, RSL arthrodesis, RSL with distal scaphoid resection, RL arthrodesis, and RL with scapholunate ligament transection were performed, and ROM was re-measured for each configuration. Changes in ROM and their relationship to the native (pre-arthrodesis) ROM were analysed.

Results: The greatest overall reduction in ROM was observed after standard RSL arthrodesis. In these preliminary data, distal scaphoid resection appeared to have a beneficial effect, particularly on radial inclination and wrist flexion. Exact analysis of the effect of ROM before arthrodesis requires a larger sample.

Conclusion: Partial wrist arthrodesis configurations differ meaningfully in their effect on wrist kinematics, with standard RSL arthrodesis producing the greatest loss of ROM and distal scaphoid resection offering a potential motion-preserving modification.

A-0218 ACCESSORY CARPAL BONES – STILL ENIGMATIC IN 2026

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Introduction: Accessory carpal bones of the wrist are uncommon anatomical variants that remain poorly understood. The first of these, the os centrale carpi, was described by Struthers in 1873, twenty-two years before the first hand radiograph was taken. Since then, numerous case reports and small series have documented more than twenty distinct accessory bones around the wrist, yet their terminology, definitions, and clinical relevance are still inconsistent.

Aim: This study aimed to identify and synthesise the available information on accessory carpal bones, to provide working definitions for each described ossicle, and to summarise current evidence regarding their potential clinical implications, including association with pain, instability, trauma, and pitfalls in imaging interpretation.

Material and Methods: A systematic meta-analysis and scoping review were conducted to identify all published cases and

case series reporting accessory bones around the wrist. Studies were screened for anatomical description, imaging findings, clinical presentation, and management. Methodological quality and risk of bias were assessed using a composite approach combining tools from the JBI Systematic Reviews and the Evidence-Based Anatomy working group. Particular attention was paid to the presence or absence of explicit definitions and reproducible diagnostic criteria for each accessory bone. Results: Quality assessment revealed that almost all included studies lacked key data elements—most commonly a clear anatomical and radiological definition of the reported accessory bone, as well as clinical follow-up. By strict criteria, the majority would have to be excluded from formal meta-analysis / scoping review. To enable meaningful synthesis and to preserve the historical and anatomical record, all studies were retained, and pragmatic working definitions for individual accessory carpal bones are proposed. These definitions are intended to reduce diagnostic ambiguity, and provide a framework for future systematic clinical and biomechanical research on accessory carpal bones of the wrist. Conclusion: Accessory carpal bones remain an under-defined and under-reported group of anatomical variants. The proposed working definitions and structured synthesis of the existing evidence provide a necessary basis for standardised reporting, more robust clinical correlation, and future anatomical and biomechanical studies.

A-0219 TRAUMATIC BRACHIAL PLEXUS INJURIES IN CHILDREN AGED THREE YEARS AND UNDER: A CASE SERIES

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Introduction: Traumatic brachial plexus injuries (BPI) in early childhood are exceedingly rare, accounting for approximately 1% of all BPI cases. Their mechanisms and clinical characteristics remain poorly described.

Aim: To report the clinical features, mechanisms of injury, surgical management, and outcomes of traumatic brachial plexus injuries in children aged three years and under.

Materials and Methods: Between 1996 and 2021, three children aged ≤ 3 years (two males and one female) sustained traumatic brachial plexus injuries. We retrospectively reviewed patient demographics, mechanism and position at the time of injury, injury pattern, and surgical procedures. All patients underwent preoperative imaging and intraoperative electrophysiological evaluation.

Results: All three patients sustained total brachial plexus avulsion injuries following motor vehicle accidents. Each was seated in the front passenger seat at the time of collision. In two cases, airbag deployment caused lateral flexion of the neck; in one, the child slipped out of the seatbelt and struck the windshield, producing a similar mechanism. Notably, no other occupants sustained injuries. Intraoperative findings confirmed preganglionic root avulsions in all cases.

All patients underwent intercostal nerve transfer (3rd–4th to the musculocutaneous nerve; 5th–6th to the median nerve). One patient without accessory nerve injury additionally received accessory-to-suprascapular nerve transfer. Two patients with follow-up exceeding five years achieved MMT grade 4 recovery of the biceps and reported minimal functional disability. **Conclusions:** Although traumatic pediatric BPI is uncommon, approximately 60% arise from traffic accidents. Our findings highlight a characteristic mechanism involving front passenger seat positioning and airbag-induced neck traction in small children. While not prohibited by law, placing young children in the front seat poses a substantial risk of severe nerve injury and should be discouraged.

A-0220 PEDIATRIC BRACHIAL PLEXUS SCHWANNOMAS: A SYSTEMATIC REVIEW OF REPORTED CASES

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Introduction: Schwannomas of the brachial plexus are extremely rare in the pediatric population and often present diagnostic challenges due to their subtle clinical manifestations and low incidence. This systematic review aims to synthesize reported pediatric cases to better understand clinical presentation, diagnosis, management, and outcomes.

Aim: To systematically review and synthesize all published case reports of pediatric brachial plexus schwannomas, in order to describe their clinical presentation, diagnostic workup, surgical management, histopathological features, and postoperative outcomes, and to highlight diagnostic and therapeutic considerations unique to the pediatric population.

Material & Methods: This review was conducted in accordance with PRISMA guidelines. A systematic search of PubMed, Scopus, and Web of Science was performed using the keywords "brachial plexus schwannoma" and "pediatric" OR "child". Inclusion criteria encompassed English-language case reports of histopathologically confirmed brachial plexus schwannomas in patients aged <18 years. After screening, four case reports met the eligibility criteria.

Results: The four pediatric patients ranged in age from 10 to 16 years, with a slight female predominance. Presentations included monoparesis, upper limb weakness, radiating neuropathic pain, and palpable masses. MRI served as the primary imaging modality, consistently demonstrating encapsulated, hyperintense lesions on T2-weighted sequences. Histopathology confirmed schwannoma in all cases, with positive S100 immunostaining. All patients underwent surgical excision without reported malignant transformation. Postoperative outcomes were favorable, with resolution or improvement of neurological symptoms and no recurrences at follow-up (ranging from 6 months to 2 years).

Conclusions: Pediatric brachial plexus schwannomas, although rare, demonstrate consistent radiologic and histopathologic features across reported cases. Early diagnosis through MRI and prompt surgical excision can lead to excellent outcomes. Awareness of this entity in pediatric patients with unexplained upper limb symptoms may facilitate earlier intervention and improve functional recovery.

A-0221 WRIST ARTHROPLASTY FOR DISTAL RADIUS FRACTURES IN THE ELDERLY PATIENT

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Introduction: Complex distal radius fractures (DRFs) in the elderly are complicated by osteoporosis and reduced bone density. This study examines the treatment of these fractures using wrist arthroplasty and presents our decision-making algorithm, which considers fracture morphology, patient age and needs, as well as associated wrist problems.

Aim: The aim of this study is to evaluate the efficacy of wrist arthroplasty using the MOTEC prosthesis for the management of complex distal radius fractures (DRFs) in elderly patients, guided by a decision-making algorithm that integrates fracture morphology, patient age and functional needs, as well as associated wrist pathologies.

Material & Methods: Twenty patients with complex DRFs were treated from September 2020 to January 2025: 4 males and 18 females, with a mean age of 75 years (range: 63–89 years). Fractures were classified using the AO scale, and associated injuries were identified with radiographic examinations (X-ray and CT) to determine individual treatment strategies. Patients meeting the criteria of our algorithm underwent wrist arthroplasty and were followed up at 6 weeks, 3 months, and 6 months, with radiographs performed to monitor implant osteointegration. Subsequently, patients completed the

DASH (Disabilities of the Arm, Shoulder, and Hand) questionnaire and the PRWE (Patient-Rated Wrist Evaluation) test. Results: Our study reports satisfactory recovery of mobility (mean E/F 41-0-38°, P/S 64-0-66°) and grip strength (Jamar dynamometer assessments with a mean of 16 kg). DASH and PRWE scores are comparable to current literature, considering the age of our population.

Conclusions: Our results support the efficacy of the Motec wrist arthroplasty as a viable treatment option for complex DRFs in a selected patient population, as defined by our decision-making algorithm. In future clinical scenarios, we plan to extend the observation period and increase the sample size.

A-0222 THUMB CARPOMETACARPAL JOINT ARTHROPLASTY: THE FIRST SCOTTISH NHS EXPERIENCE AND COMPARATIVE EVALUATION WITH TRAPEZIECTOMY AND RECURRENT STEROID INJECTIONS

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Introduction: Thumb carpometacarpal (CMC) joint osteoarthritis is a common and disabling condition. It is particularly prevalent in women and those doing manual or repetitive handwork. In Scotland, estimated rates of symptomatic thumb base arthritis mirror UK data, affecting up to 1 in 5 adults over 55 years. Treating younger, working-age patients can be particularly challenging. Trapeziectomy can require a long recovery, cause weakness, and risk metacarpal subsidence. It costs between £3000 and £4000. Recurrent steroid injections offer only temporary relief and costs accumulate over time. These injections cost £35 to £213, depending on whether imaging is used. CMC joint arthroplasty may allow quicker rehabilitation and better function. However, there are no current Scottish NHS data about this mode of treatment.

Aim: This study aims to identify the functional outcomes, complications and cost implications of the first Scottish NHS cohort undergoing CMC joint replacement.

Material & Methods: A retrospective review included 19 patients (20 thumbs) who had CMC joint replacement from August 2023 to August 2025 in NHS Highland. Data covered demographics, occupation, and pre- and post-operative function. Complications and revision rates were also recorded. Data were collected from electronic patient records. Functional outcomes were measured with the Quick Disabilities of the Arm, Shoulder and Hand (qDASH) questionnaire. For comparison, estimated costs of arthroplasty, repeated steroid injections, and trapeziectomy were analysed.

Results: There were 17 female patients (18 thumbs) and 2 male patients. The mean age was 56.4 years. All patients had stage 3 arthritis. The mean pre-operative qDASH was 68.7. At 6 weeks post-op, mean qDASH was 18.77. Patients returned to driving in an average of 7.7 weeks and to full-time work in 8.42 weeks. Complications were complex regional pain syndrome in 3 patients and stitch reaction in 2 patients. No patient needed revision surgery. Cost modelling suggests joint arthroplasty becomes cost-efficient after two to three steroid injection cycles in younger patients. Compared to trapeziectomy, arthroplasty enabled quicker functional recovery and better early pinch strength without increasing complication rates.

Conclusions: This represents the first reported Scottish NHS experience of thumb CMC joint arthroplasty. Preliminary findings indicate favourable short-term functional outcomes with early return to work and low complication rates. For the younger and working-age patients, it is a safe and cost-effective alternative to trapeziectomy. Further longitudinal evaluation is warranted to assess durability and long-term functional gains.

A-0223 INTERDISCIPLINARY SOCIAL MEDIA PREVENTION CAMPAIGN TO PREVENT FIREWORK INJURIES AROUND NEW YEAR'S EVE IN 2025/2026

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Introduction: Every year around New Year's Eve a multitude of injuries occur due to the improper handling of fireworks. These injuries most commonly affect the hands, the ears, or the eyes. They are often accompanied by severe burn injuries. Mostly young men, aged 15-30 years old, are affected by the often self-inflicted injuries. So far, prevention campaigns have consisted of leaflets, interviews, or press releases a couple of days before New Year's Eve, employing unemotional language in media not commonly accessed by the target audience of young men. Hence, previous attempts were either not of interest to the target audience or simply not even seen by them.

This year, the German societies for trauma orthopaedics, for otorhinolaryngology, for ophthalmology, for paediatrics, for hand surgery, for plastic surgery and for burn injuries have decided to join forces to conduct a different kind of prevention campaign.

Aim: Our aim was to launch an emotionally involving social media campaign, targeted directly at the relevant audience on Instagram and TikTok. In order to prevent self-inflicted injuries, we wanted to raise awareness for the danger of mishandling fireworks without raising reluctance against the campaign.

Material & Methods: We have invited five advertising agencies to pitch their ideas for an emotional social media campaign; four actually pitched. The interdisciplinary team of medical experts decided on the agency with the best concept for the target group. Consecutively, the campaign was detailed. It consisted of one hero-asset: a 30 second movie-clip generated with the assistance of AI. This asset was then broken down into shorter assets and rolled out on Instagram and TikTok in December, reaching the peak of its targeting media budget between Christmas and New Year's Eve 2025. In addition to the target audience of young men, a secondary target audience of parents was also included. For them, the campaign was accompanied by a landing page with background information on the campaign, as well as expert knowledge provided by the involved societies. The communication on the social media platforms during the campaign was managed by the agency with the back-up assistance of medical experts from every field.

Results: During and after the campaign total reach, views and clicks were used as main key performance indicators. Yet we also kept count of interactions, such as likes and comments.

Conclusions: A well-considered and executed social media campaign is useful to reach a lot of people in a difficult-to-reach target group. While the direct measurement of prevented injuries is impossible, our data reflects the broad spread and positive reception of the campaign, which means that users engaged with our message. Future prevention campaigns should try to focus more directly on the discourses and language of the target audience, regarding the design of the campaign as well as the channels it is created for.

A-0224 EARLY PERIPROSTHETIC OSTEOLYSIS FOLLOWING RADIAL HEAD REPLACEMENT

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Introduction: Radial head replacement (RHR) is a surgical option for comminuted radial head fractures that are not amenable to open reduction and internal fixation (ORIF) particularly in the presence of elbow instability or complex injury patterns.

Several implant designs are available including unipolar or bipolar, long or short stem and cemented or uncemented press-fit options.

Radial neck osteolysis (RNO) is a known complication following RHR, with reported prevalence ranging from 50% to 92% in uncemented press-fit implants. Although RNO is frequently observed in uncemented RHR, its risk factors and clinical significance remain unclear.

Aim: This study aimed to evaluate the midterm clinical and radiographic outcomes of uncemented press-fit radial head replacements, with a particular focus on the prevalence and potential clinical implications of periprosthetic osteolysis.

Material & Methods: A single-center retrospective study included all patients who underwent RHR between 2021 and 2024, with a minimum follow-up of six months. All implants used were uncemented press-fit prostheses. Patients were evaluated both radiologically and clinically using the QuickDASH and the Mayo Elbow Performance Score (MEPS). Osteolysis around the implant was assessed using a method adapted from Gruen's classification for hip arthroplasty. Associations between radial neck osteolysis (RNO) and various clinical and surgical parameters were analyzed

Results: A total of 29 patients were included in the study after meeting inclusion criteria with a median age of 63 years and a mean follow-up of 24 months. Three different implant brands were used. On clinical evaluation, the median visual analog pain scale (VAS) score was 1. The mean flexion-extension arc was 10° to 130°, and the mean pronation-supination arc ranged from -70° to 80°.

The median Mayo Elbow Performance Score (MEPS) was 85, corresponding to a 'good' rating. The median QuickDASH score was 18.2, indicating mild disability. Radiographic evidence of osteolysis was observed in 78.6% of patients, and the signs of periprosthetic osteolysis were observed as early as three months postoperatively in some cases. No statistically significant association was found between osteolysis and clinical outcomes, fracture type, implant type or lateral ligament repair. Complications occurred in three patients (implant overstuffing), with only one requiring surgical intervention.

Conclusions: Although satisfactory functional outcomes were observed in most patients, with low pain scores and good elbow mobility, the high prevalence of periprosthetic osteolysis (78.6%) remains a concern following uncemented press-fit radial head replacement. No statistical association was found between osteolysis and clinical outcomes, fracture classification, implant brand, or lateral ligament repair, suggesting that osteolysis may develop independently of these factors.

The clinical impact of osteolysis remains uncertain, as most patients remained asymptomatic. However, given the potential long-term consequences such as loosening or failure, its high prevalence should prompt caution, particularly in younger or more active patients.

A-0225 LONG-TERM 9-YEARS FOLLOW-UP OF A POLY-L/D-LACTIDE SPACER IMPLANT INTERPOSITION AFTER TOTAL TRAPEZIECTOMY

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Introduction: EG stage IV basal thumb osteoarthritis affects the trapeziometacarpal (TMC) and scaphotrapeziotrapezoid (STT) joints, often requiring surgical intervention when conservative management fails. Total trapeziectomy remains the golden standard, but may induce proximal migration of the first metacarpal, leading to scaphometacarpal impingement

and functional impairment. The poly-L/D-lactide (RegJoint™) scaffold was developed as a bioabsorbable interposition implant designed to preserve joint height and support tissue regeneration. Previous shortterm studies have demonstrated significant pain decrease and functional improvement. But concerns have emerged regarding osteolysis, foreign-body reactions, and gradual reduction of the scaphometacarpal distance, suggesting potential structural insufficiency over time. Aim: We report a long-term follow-up (9-year) of this implant, re-investigating our previous publication at 1-year follow-up (Van Royen et al., JWS 2019), where we reported radiological collapse of the scaphometacarpal distance of 45% and osteolysis of the distal scaphoid pole and/or proximal metacarpal in 60%.

Materials and Methods: A single center single surgeon cohort study was conducted with 9 patients (10 thumbs; mean age 64 years) with EG stage IV osteoarthritis, who underwent total trapeziectomy with insertion of 2 poly-L/D-lactide scaffolds. 80% were for primary osteoarthritis and 20% for failed trapeziectomy. All procedures were performed by the same hand surgeon using a dorsal approach. Pain (VAS), QuickDASH, thumb mobility, gripstrength, and keypinch were assessed preoperatively, at 1 year, and at 9 years postoperatively. The scaphometacarpal distance and presence of osteolysis were evaluated radiographically. Statistical significance was set on $p \leq 0,05$.

Results: At 9-year follow-up, 5 patients (6 thumbs, or 60%) were still available for assessment. None of them underwent revision surgery during follow-up. Pain decrease at 1 year (VAS $4,0 \pm 3,0$) persisted at 9 years (VAS $4,6 \pm 2,3$), and remaining decreased compared to preoperative level (VAS $7,4 \pm 1,7$; $p = 0,07$). Opposition, retropulsion and web space opening were not significantly different from the contralateral side at both time points. Gripstrength and keypinch did not differ significantly between 1 and 9 years. The most notable finding was the decrease in functional outcome over time. Functional improvement seen at 1 year (QuickDASH 28,2) deteriorated after 9 years (QuickDASH $61,8 \pm 16,0$), ending even worse than preoperative level (QuickDASH 55,8; $p = 0,03$). Radiographically, the mean scaphometacarpal distance decreased significantly from immediate postoperative measurement (9,0 mm $\rightarrow$ 1,7 mm at 9 years; $p = 0,001$), indicating progressive metacarpal collapse. At 1-year follow-up, the mean scaphometacarpal distance was 4,5 mm. Osteolysis and bone erosion were observed in 60% at 1 year but showed no progression at 9 years.

Conclusion: According to our results, pain decrease and thumb mobility were preserved on the long-term. But, the functional improvement decreased over time, ultimately resulting in higher dysfunction than observed preoperatively. Progressive scaphometacarpal collapse developed despite the implant, underscoring its limited mechanical support. These small cohort observations highlight the need for further comparative studies to clarify the benefit of this implant compared to alternative techniques used after trapeziectomy, like tendon interposition, ligamentoplasty or suspension arthroplasty.

A-0226 A META-ANALYSIS OF THE DIAGNOSTIC ACCURACY OF DIFFERENT SONOGRAPHIC MEASUREMENT TECHNIQUES OF THE MEDIAN NERVE FOR CARPAL TUNNEL SYNDROME

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Background: Carpal Tunnel Syndrome (CTS) is the most common peripheral nerve entrapment, affecting 7-16% of adults in the United Kingdom. Nerve conduction studies (NCS) have been relied on as the gold standard for diagnosing CTS, but they are invasive, time-consuming, and more expensive. Ultrasonography has emerged as a rapid, non-invasive, cost-effective alternative that allows the operator to obtain clear visualisation of the median nerve, surrounding structures, and any anatomical variations that could aid surgical planning. Traditionally, diagnostic ultrasound has used the cross-sectional area of the median nerve at the carpal tunnel inlet (CSAi). However, reliance on a single CSA measurement of the median nerve using ultrasonography has been limited due to demographic factors such as age, sex and body

habitus, which all influence nerve size and can yield false-positive results. This is especially observed in populations in which individuals have naturally larger nerves. The proposed solution has been to take a measurement of the CSA at the forearm and calculate the wrist-to-forearm ratio (WFR), which normalises the patient to their own anatomy and can potentially reduce the demographic variability.

Aim: To evaluate the diagnostic accuracy of ultrasound-based WFR compared with CSAi in confirming CTS, and to determine whether the WFR reduces demographic-related false-positive results. Nerve conduction studies served as the reference standard.

Materials and Methods: This systematic review and meta-analysis of diagnostic test accuracy was conducted in accordance with the PRISMA-DTA guidelines and was prospectively registered with the Open Science Framework (OSF) on the 5th of September 2025. A comprehensive search was conducted on the 31st of August in Ovid, combining MEDLINE, Embase, the Cochrane Database of Systematic reviews and CENTRAL. Two reviewers independently screened studies using the AI screening tool, Rayyan and QUADAS-2 was used to assess the risk of bias. Only level I and II diagnostic accuracy studies assessing ultrasonographic CSAi and WFR, with NCS confirmation, were included. Optimal sensitivity and specificity values were extracted to construct 2x2 contingency tables to be used in quantitative synthesis using MetaBayesDTA, a Bayesian bivariate random-effects model, to generate pooled diagnostic accuracy measures and Summary Receiver Operating Characteristic (SROC) curves.

Results: Nine studies met the inclusion criteria, evaluating a total of 1037 wrists and an additional 232 participants from papers where results were reported per patient. Ultrasound demonstrated strong diagnostic accuracy across all parameters. CSAi yielded a pooled sensitivity of 0.85 and specificity of 0.88; however, it showed heterogeneity between studies, consistent with the effects of demographic influence on nerve size. In comparison, the WFR demonstrated a pooled sensitivity of 0.81 and a specificity of 0.87 with notably greater diagnostic consistency. WFR also reduced false-positive rates in studies in which CSAi misclassified controls with naturally larger nerves due to demographic variation. Although less reported, the difference in CSA between the wrist and the forearm (Δ CSA) showed the highest pooled accuracy overall, with the tightest credible region on SROC analysis.

Conclusions: WFR and Δ CSA demonstrate greater diagnostic consistency and accuracy over CSAi for sonographic diagnosis of carpal tunnel syndrome.

A-0227 SHOULDER PAIN IN TÜRKİYE: ITS PREVALENCE, RISK FACTORS, AND THE IMPACT OF PAIN DEFINITIONS ON THE PREVALENCE, A CROSS-SECTIONAL STUDY

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Introduction: The prevalence and risk factors associated with shoulder pain in Türkiye remain inadequately understood. Various definitions of shoulder pain have been utilised in the literature. A consensus on the definition of shoulder pain is lacking.

Aim: This study investigates the prevalence and risk factors related to shoulder pain in Türkiye, along with the influence of different definitions of shoulder pain on its prevalence rates.

Material & Methods: For this cross-sectional study, interviews were conducted in person as well as through social media. The study questionnaire included questions concerning demographics, employment, and shoulder pain. There were four

different definitions that were utilised in order to determine the prevalence of shoulder pain. Two statistical methods that were utilised were chi-square analysis and univariate logistic regression.

Results: A total of 3,156 participants were included, with a mean age of 41.8 years (± 17.4 years). The prevalence of shoulder pain lasting beyond 1 day, 7 days, 1 month, and 3 months was 40%, 13%, 7%, and 6%, respectively. A higher prevalence of shoulder pain was reported among women compared to men across all categories ($p=0.001$ or $p<0.001$). Age, body mass index, sex, physical activity, comorbidities, and shoulder activity in occupational settings have been identified as risk factors for shoulder pain.

Conclusions: Shoulder pain is a common issue in Türkiye. The prevalence of shoulder pain has undergone significant changes concerning its definition. Recruiting individuals with shoulder pain persisting for over one month may enhance the efficacy of randomised controlled trials. Policymakers may modify the identified risk factors to alleviate shoulder pain burden.

A-0228 OUTCOMES OF RADIUS LENGTHENING OSTEOTOMY FOR POSTTRAUMATIC GROWTH ARREST: A CASE SERIES OF THREE PATIENTS

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Introduction: Distal radius fractures are the most common skeletal injuries in children. Posttraumatic growth arrest of the distal radius occurs in 1–7% of cases, particularly following physeal or intra-articular involvement. As the distal radial physis contributes approximately 75% of the radius's longitudinal growth and typically closes around age 15 in females and 17 in males, premature closure can result in significant deformity. Growth arrest may be partial or complete, leading to complications such as length discrepancy, ulnar overgrowth, abnormal wrist balance, and distal radioulnar joint (DRUJ) instability. Treatment choice depends on the degree of length discrepancy, angular deformity, and remaining growth potential. This study presents a case series of three adolescent patients treated with radial lengthening osteotomy for posttraumatic distal radius growth arrest.

Aim: To evaluate the outcomes of radius lengthening osteotomy in restoring radial length, painless range of motion, and wrist balance in adolescent patients with posttraumatic distal radius growth arrest, if otherwise a length discrepancy of two or more centimeters between forearms is expected.

Methods: A retrospective review was conducted of three patients (mean age 13.3 ± 0.5 years) with distal radius growth arrest secondary to prior distal radius fractures. All underwent radius lengthening osteotomy, followed by gradual distraction using an external fixator and subsequent plate fixation with an iliac crest bone graft. Clinical and radiographic assessments were performed preoperatively, postoperatively, and at final follow-up. Outcome measures included correction of radio-ulnar length discrepancy, restoration of range of motion, and complication rates.

Results: Mean distraction duration was 8 ± 1.7 weeks (range 6–9), with consolidation achieved at 13 ± 6 weeks (range 10–20). At the latest follow-up (mean 20 ± 6 months, range 12–26), all patients demonstrated near-equal forearm lengths and functional improvement. The mean radio-ulnar length discrepancy improved from 7 ± 5 mm preoperatively to -5 ± 3.5 mm postoperatively. Postoperative motion averaged 75° extension / 70° flexion and 85° pronation / 80° supination, with minimal deficits compared to the contralateral side. Radiographs confirmed correction of angular deformity and restoration of wrist balance without evidence of ulno-carpal impaction. Complications included one transient sensory disturbance and one delayed union requiring revision following trauma; both resolved without functional sequelae.

Conclusion: Radius lengthening osteotomy is an effective and reliable technique for correcting posttraumatic distal radius growth arrest, restoring forearm length, and re-establishing wrist balance. When a length discrepancy exceeding 2 cm is

anticipated, early surgical intervention can achieve excellent functional and radiographic outcomes. Larger studies with longer follow-up are needed to confirm long-term durability and optimize treatment timing.

A-0230 TERES MAJOR TRANSFER TO RESTORE EXTERNAL ROTATION OF SHOULDER IN ERB PALSY PATIENTS

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Introduction: The lack of external rotation and shoulder abduction as sequelae of obstetric brachial plexus palsy requires a release of the subscapularis muscle associated with tendon transfer of the internal rotator of the shoulder. .

Aim: The aim of this study was to present the results of a teres major transfer to the infraspinatus tendon

Material & Methods: This study included 20 patients (9 boys and 11 girls) with a mean age of 3 years 8 months (range, 1.5-14 years). The average follow-up time was 42 months (range, 12-48 months) to determine whether external rotation weakness and internal rotation contracture sequelae were managed by anterior release of the subscapularis and teres major tendon transfer to the infraspinatus tendon.

Results: We found marked improvement in shoulder abduction from 67° before surgery to 158° after surgery. We also found marked improvements in active external rotation from 8° before surgery to 85° after surgery and in passive external rotation from 0° preoperatively to 72° postoperatively. Two cases showed a loss of the last degrees of internal rotation, but this improved after physiotherapy.

Conclusions: Anterior release of the subscapularis tendon with a teres major transfer to the infraspinatus tendon significantly improves shoulder function in Erb palsy patients with internal rotation contracture.

A-0231 CHANGES IN FINGERTIP COLD INDUCED VASODILATATION (HUNTING REACTION) ON ACUTE EXPOSURE TO HIGH ALTITUDE

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Introduction: Cold Induced Vasodilation (CIVD) of the extremities is an interesting part of human physiology. Although the physiology of the CIVD reaction remains unknown, there are indications that hypoxia influences our CIVD reaction.

Aim: The aim of this study is to measure the influence of acute high-altitude induced hypoxia on the CIVD reaction of the fingertips.

Material & Methods: The CIVD reaction was measured using immersion of one hand in a water bath of 0°C in twelve healthy volunteers at low (1235 m) and high (3800m) altitude during 35 minutes. High altitude was reached by a 20-minute cable-car ride. Testing was performed indoors (room temperature, 22-25°C) at both altitudes. Data analysis was performed measuring the parameters of the CIVD reaction. Differences were found using the paired Student's t-test.

Results: There was no significant difference in baseline finger temperature, onset time, peak time, and frequency of the CIVD reaction. However, at high altitude, maximum temperature and amplitude were significantly higher, slope was steeper and minimum temperature was lower.

Conclusions: We did not find evidence for a diminished CIVD reaction at high altitude due to hypoxia.

A-0232 COLD SPRAY OUTPERFORMS VIBRATION FOR PAIN CONTROL IN TRIGGER FINGER INJECTIONS: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Trigger finger has a lifetime prevalence of up to 3%. It results from fibrocartilaginous metaplasia of the A1 pulley and volar tendon surface, causing tendon entrapment and impaired digit function. Glucocorticoid injections into the A1 pulley are effective but painful due to dense nerve endings.

Ethyl chloride "cold spray" is used by approximately 75% of hand surgeons. Topical vibration follows gate control theory by stimulating Pacinian corpuscles via large A β fibers to reduce nociception. Evidence remains conflicting. The only direct comparison of cold spray and vibration in upper extremity injections favored vibration, but included multiple sites beyond trigger finger.

Aim: To compare cold spray versus vibration versus no anesthesia for pain reduction during trigger finger corticosteroid injections using VAS scoring.

Material & Methods: Prospective three-arm RCT (ClinicalTrials.gov: NCT05405452) at one hand surgeon's clinic (Aug 2023–Dec 2024). CONSORT-compliant, IRB-approved. Patients >18 years with trigger finger were randomized 1:1:1.

Control (n=38): 20 mg triamcinolone at A1 pulley

Cold spray (n=38): 5-sec ethyl chloride pre-injection

Vibration (n=37): Blaine Labs device (155–160 Hz) 1–2 cm proximal, activated 5–10 sec pre/during injection

Pain assessed immediately post-injection on 10-point VAS. Welch's t-tests compared groups. Python analysis.

Results: Cold spray mean VAS 3.42 (SD 2.20; 95% CI 2.77–4.07), significantly lower than control 4.58 (SD 2.48; 95% CI 3.84–5.32; $p=0.0345$) and vibration 4.99 (SD 2.37; 95% CI 4.24–5.75; $p=0.0041$). Vibration vs control $p=0.469$.

Conclusions: Cold spray effectively reduces trigger finger injection pain; vibration offers no benefit. Hand surgeons should prioritize cold spray for better patient comfort.

A-0233 SHORT TERMS RESULTS AFTER SENSORIMOTOR TRAINING IN CASE OF ULNAR SIDED WRIST PAIN

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Introduction: Wrist pain is a common following strain in the wrist after fall on outstretched arm. 1 These traumas most commonly damage the scapholunar (SL), the lunotriquetral (LT) ligaments and the triangular fibrocartilage complex (TFCC) leading to pain, that interferes everyday life and work. There is some evidence of the effect of sensorimotor training in case of dorsal wrist pain, but few in case of ulnar sided wrist pain 2. Chen described a case report for sensorimotor training of TFCC. 3 Operation can be an alternative in case of persisting chronic pain after conservative treatment.

Aim: The aim of the study was to evaluate the effect of sensorimotor training as intervention for ulnar sided wrist pain.

Material & Methods: The study was a quantitative cohort study with pre-post design. 8 patients (6 female, 4 dominant wrists) with median age 30,5 years (Q1; Q3 21,75; 51,5) participated. Patients filled out the questionnaires QuickDASH (0-100), DASH work and free time (0-100), Patient Rated Wrist and Hand Evaluation (PRWHE) pain (0-50), function (0-50) and total (0-100) and VAS (0-10) in rest and in activity before the first and at last consultation. The intervention was a 2 month-long sensorimotor training inspired by publications and lectures on international congresses. 4, 5 Training

was fulfilled in neutral position of the wrist; starting with isometric exercises with rubber band, bottle and a ball and progression to resistance exercises with jojo, Thera bar, Powerball and ball throwing exercises. All the patients had follow-up with the same hand therapist.

Results: Results are presented with median and Q1:Q3. There was statistic and clinically significant change in all the self-reported measures, Quick DASH -28,4 (-39,8: -11,9), Dash work -25 (-60,9: -18,8), DASH free time -37,5 (-56,3: -8), PRWHE pain -21,5 (-25,5: -20,3), PRWHE function -13,5 (-30,9: -7,8), PWWHE total -35,55 (-53,9: -29), VAS in rest -1,5 (-2,8: -0,3), VAS in activity -5,5 (-6,8: -4,3).

Conclusions: The results show that sensorimotor training can indicate good results of self-reported function and pain in case of ulnar sided wrist pain caused by partial ligament injuries.

A-0234 CORRECTION OF DISTAL HUMERUS MALUNIONS WITH 3D-GUIDED OSTEOTOMY USING PATIENT SPECIFIC INSTRUMENTATION: RETROSPECTIVE ANALYSIS OF 10 CASES

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Introduction: Distal humerus fractures are among the most frequent pediatric fractures, and while many heal without complications, malunions can lead to major long-term functional limitations. Resulting deformities may include varus or valgus angulation, rotational abnormalities, restricted elbow range of motion, or chronic pain, all of which can significantly impair daily activities and quality of life in adulthood. Corrective osteotomy remains the only definitive treatment capable of restoring both anatomical alignment and functional biomechanics of the elbow. However, this procedure is technically demanding due to the complex three-dimensional anatomy of the distal humerus and the multiplanar deformities commonly encountered after malunion. Recent advances in three-dimensional preoperative planning and patient-specific instruments (PSI) have markedly improved surgical precision. These tools allow accurate execution of the planned osteotomy and may enhance both correction accuracy and clinical outcomes.

Aim: The aim of this study was to evaluate the clinical, radiological, and functional outcomes of 3D-guided corrective osteotomy using patient-specific instrumentation in patients with distal humerus malunions, and to determine the feasibility, accuracy, and safety of this technique.

Materials and Methods: This retrospective study included ten patients (median age 17 years, range 9–50) treated for symptomatic distal humerus malunions between 2013 and 2023. Initial fractures were managed conservatively in six patients and surgically in four; congenital or atraumatic deformities were excluded. Preoperative assessment included pain evaluation, elbow range of motion (ROM), and CT-based 3D deformity analysis. All operations were performed through a posterior approach with exposure of both columns and systematic ulnar nerve release. A 3D-printed PSI cutting guide allowed precise execution of the osteotomy according to the preoperative plan, followed by repositioning guides to achieve accurate alignment. Fixation was carried out using plates and screws to ensure stable reconstruction. Follow-up examinations were performed at six months, twelve months, and at final consultation. Pain levels, ROM, radiographic consolidation, complications, and the correlation between planned and achieved correction were systematically evaluated. Results: All osteotomies achieved the intended correction and complete bone healing within an average of six weeks. Postoperative pain decreased markedly, with visual analogue scale scores improving from 2 preoperatively to 0 at final follow-up. Eight patients were entirely pain-free, while two adults with pre-existing complex posterolateral instability reported persistent moderate discomfort. ROM improved in eight patients, including gains of up to 50° in pronation and 75° in supination, although these changes did not reach statistical significance. Three transient nerve complications

were observed: two involving the ulnar nerve and one partial radial nerve palsy. Ulnar symptoms resolved fully, while the radial palsy showed incomplete recovery at final follow-up.

Conclusion: 3D-guided corrective osteotomy using patient-specific instrumentation is a feasible, precise, and effective method for treating distal humerus malunions. It provides reliable deformity correction, consistent bone healing, meaningful pain reduction, and functional improvement. The integration of 3D planning and PSI enhances surgical accuracy and reproducibility, representing a promising approach for optimizing long-term outcomes in distal humerus deformity correction.

A-0235 PROXIMAL PHALANX FRACTURE TREATED BY A LUCERNE CAST WITH EARLY ACTIVE MOTION PROTOCOL: A RETROSPECTIVE STUDY OF 71 FRACTURES

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Introduction: Hand fractures are very common and they constitute a significant economic burden. The management of stable extra-articular fractures is well-known in literature. Nevertheless, there is still some debate concerning the unstable and intra-articular proximal phalanx fractures.

Surgical treatment guarantees stable fixation. Nevertheless, an important risk for complications needs to be taken into account for surgery for such fractures. Postoperative stiffness is the most prevalent complication. On the other hand, conservative treatment with a static splint has been shown to carry a significant risk of stiffness and functional impairment.

Aim: This retrospective study presents the results obtained using an early active motion protocol for all types of closed proximal phalanx fractures, with or without initial rotational deficit or extension lag. This is one of the largest studies concerning the conservative treatment of proximal phalanx fractures with an early active motion protocol. It was hypothesized that this treatment gives results at least as good of the operative treatment.

Material & Methods: Inclusion criteria were: an age of 18 years or older, closed proximal phalangeal fractures of digits two to five and a minimum follow up period of six months at the time of the re-visit to the hospital.

Exclusion criteria included: patients under 18 years of age, open fractures, fractures of the thumb, concomitant lesions of the hand other than proximal phalangeal fractures, pathological fractures, operated fractures and concomitant lesions influencing the mobility of the fingers.

Assessment was conducted using the total active motion score (TAM), grip strength and key pinch. A series of questionnaires were also administered, including a visual analogue scale (VAS) for pain and satisfaction, the Michigan Hand Outcomes Questionnaire (MHQ), the patient-related wrist hand evaluation and the SF-36 score.

Results: Out of 71 patients included in the study, 54 responded to our invitation (71 fractures; response rate 76%).

The minimum follow-up period was six months.

The mean TAM score was 90,9% compared to the uninjured side. The VAS satisfaction score was 86.2%, the VAS pain score was 1.0 points and the MHQ score was 83.8 points versus 92.9 points for the uninjured side ($P=0.0002$). A non-significant difference in grip strength (29.3 vs 33.4 kg, $P=0.137$) and key pinch (8.1 vs 8.6 kg, $P=0.271$) was observed between the injured and healthy side. No radiological deterioration of fracture displacement was observed during follow up both for the frontal (4.8° vs 4.0° , $P=0.379$) and sagittal (12.6 vs 11.2° , $P=0.545$) plane. Fourteen percent of patients experienced complication. CRPS was observed in 2 patients (2.8%). 10 patients (14%) needed additional bracing, because of persisting extension lag or flexion limitation, in order to regain full range of motion.

Conclusions: Conservative treatment of extra-and intra-articular proximal phalanx fracture using an early active motion

protocol in a Lucerne cast is favorable, providing excellent results in terms of mobility, force, function and patient-related outcomes. The functional results are comparable to those of surgical treatment but the complication rate is clearly lower.

A-0236 TOTAL WRIST ARTHRODESIS WITH CUSTOM 3D PRINTED TITANIUM CAGE-PLATE CONSTRUCT AND FREE VASCULARISED PERIOSTEAL FLAP AUGMENTATION FOR FAILED TOTAL WRIST ARTHROPLASTY

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Introduction: Salvage of a failed wrist arthroplasty can be challenging, potentially requiring management of large bone defects, peri-prosthetic infection, metallosis and osteolysis. A durable salvage operation is conversion to wrist arthrodesis which can provide a stable, pain-free wrist with preservation of tendon function. We present a case of massive osteolysis after a failed 4th generation wrist arthroplasty, which was converted to a wrist arthrodesis using a custom 3D printed titanium cage and augmentation with a free medial femoral condyle periosteal flap.

Materials & methods: A 44-year-old female with Juvenile Rheumatoid Arthritis presented with progressive pain and deformity 14 years after total wrist arthroplasty. A two-stage approach was utilised. In the 1st stage extensive osteolysis and metallosis was encountered requiring tenosynovectomy and implant removal, microbiological sampling and insertion of a cement spacer. In the second stage a custom 3D titanium cage-plate construct was filled with morselized femoral head allograft and fixed to the native metacarpals and radius with an onlay free vascularised medial femoral condyle periosteal flap.

Results: Computed tomography confirmed bony union was achieved at 6 months with excellent flexor and extensor tendon function and a PRWE pain score of 12/50 at 16 months.

Conclusions: Wrist arthrodesis following failed wrist arthroplasty has traditionally been achieved using femoral head allografts and iliac crest bone grafting with standard dorsal wrist fusion plates. However, this approach may be limited by the complex and large bone defects encountered in failed wrist arthroplasty. Custom 3D titanium cage implants with allograft have been described in reconstruction of bone defects after tumour resection, trauma and in arthrodesis. Recalcitrant upper extremity non-unions and failed wrist arthrodesis have been treated with free medial femoral condyle periosteal flaps.

Custom 3D titanium cage plate constructs with allograft bone grafting allows reconstruction of the failed wrist arthroplasty to wrist arthrodesis providing a durable solution to complex bone defects. Augmentation with a free medial femoral condyle periosteal flap provides a highly vascularised, osteogenic layer which aids bony fusion and a gliding layer to aid tendon function.

A-0237 A NOVEL APPROACH: ARTHROPLASTY OF THE INTERPHALANGEAL JOINT IN TRIGGER FINGER USING ACELLULAR DERMAL GRAFT -CASE REPORT

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Introduction: The proximal interphalangeal (PIP) joint plays a vital role in hand dexterity and function.

Traumatic injuries or chronic conditions may lead to post-traumatic arthrosis and motion restriction. Conventional surgical

options—such as prosthetic arthroplasty or arthrodesis—are often invasive and may compromise joint mobility. This report describes a novel, minimally invasive technique utilizing an acellular dermal graft (ADG) to restore function in a patient with post-traumatic trigger finger.

Aim: The aim of this case report is to describe a new arthroplasty technique of the interphalangeal joint using an acellular dermal graft (ADG) in a patient with post-traumatic trigger finger, aiming to improve joint mobility and aesthetic outcomes while minimizing invasiveness. This method is intended to restore joint function even in cases of severe joint damage.

Material & Methods: Case Report

A 37-year-old male soldier sustained an electric saw injury to his right hand, resulting in limited PIP joint motion and flexion deformity. Initial management included tendon repair and local skin rafting, followed by a secondary procedure one month later. At five months postoperatively, the patient presented with persistent arthrosis, dislocation, and dense scarring.

Surgical Technique: The distal articular surface of the proximal phalanx was debrided and prepared. An acellular dermal graft was interposed and fixed within the joint space. Intraoperative assessment demonstrated satisfactory flexion and extension. Closure was achieved using double V–Y advancement skin plasty, enabling near-complete finger extension.

Results: At six months follow-up, the patient exhibited marked improvement in joint mobility and hand function, though full range of motion was not completely regained. No postoperative complications were observed. The patient successfully returned to active duty, and both scar quality and skin coverage were satisfactory. Before surgery, the range of motion of the PIP joint was limited, with approximately 40–45° of flexion contracture.

After surgery, full extension (0°) and flexion up to 95° were achieved.

This indicates a significant improvement in the amplitude of PIP joint motion, demonstrating successful restoration of functional mobility

Conclusions: Acellular dermal graft arthroplasty offers a biologic, motion-preserving alternative for managing post-traumatic arthrosis of small joints. It reduces invasiveness, facilitates early rehabilitation, and enhances aesthetic results, though complete motion recovery may not always be achieved.

ADG-assisted arthroplasty of the PIP joint represents a promising minimally invasive technique for post-traumatic trigger finger with arthrosis. It provides both functional and cosmetic benefits compared with traditional methods. Further clinical studies with larger cohorts are recommended.

A-0238 EFFECTS OF THENAR MUSCLE INSTRUMENT ASSISTED SOFT TISSUE MOBILIZATION AND THUMB JOINT MOBILIZATION ON ULNAR SIDED-WRIST PAIN OF TFCC INJURY PATIENTS

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Introduction: Patients with Triangular Fibrocartilage Complex (TFCC) Injuries treated conservatively with a cast or brace that promotes the Position of Safe Immobilization (POSI) would have the thumb in adduction and open opposition to the index and middle fingers. The POSI allows a person to still hold or grip objects with the fingers and the thumb during the period of immobilization.

The duration of POSI can vary depending on the degree and type of injury, as well as the surgeon's decision. In clinical observation, after immobilization, there appears to be a tendency for the thumb to assume a resting posture that is more adducted compared to the non-affected side. This postural tendency of the thumb can affect the mechanism of the wrist during flexion as well as influence the tension of the flexor retinaculum. These subtle postural changes may alter the mechanical balance of a resting hand and, in turn, may affect how patients experience pain in the ulnar side of the wrist during motion.

In literature, evidence on the effects of mobilization of the flexor retinaculum to address symptoms of carpal tunnel syndrome is available. However, there is none on the effects of joint mobilization of thumb, or the thenar eminence and their influence on ulnar sided wrist pain experienced by patients with TFCC injury.

Aim: This study aims to ascertain the relationship between improving thumb posture and ulnar sided pain reduction with Instrument Assisted Soft-Tissue Mobilization (IASTM) of the thenar eminence and joint mobilization of the thumb.

Material & Methods: This is a mixed method retrospective study of three patients with traumatic TFCC injuries, conservatively treated in a Muenster cast or splint for at least 6 weeks.

The author mobilized the thenar muscle using a generic stainless-steel tool and massage oil for lubrication. Gentle joint mobilization of the thumb and the trapezium followed the IASTM of the thenar eminence.

Numeric Pain Rating Scale (NPRS) was the outcome measure utilized pre- and post- IASTM and joint mobilization.

Results: Patients consistently reported varying degrees of pain relief and tension reduction in the hand and ulnar side of the wrist after each session of thenar IASTM and thumb joint mobilization.

Conclusions: IASTM of the thenar muscles may help reduce the adducted resting posture of the thumb post-immobilization. Coupled with thumb joint mobilization, it may also reduce the tension of the flexor retinaculum on the ulnar side of the wrist and potentially help reduce pain in TFCC injury patients. However, conducting a study with a bigger sample size and utilizing a more quantifiable instrumentation such as an imaging ultrasound is highly recommended.

A-0239 BRACHIALIS BRANCH TO RADIAL NERVE TRANSFER FOR RESTORATION OF WRIST AND FINGER EXTENSION IN SPASTICITY AND TETRAPLEGIA: AN ANATOMICAL FEASIBILITY STUDY

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Introduction: In patients with upper motor neuron lesions, joint deformities and functional impairment can arise from imbalances among muscle groups, including hyperactive elbow flexors combined with weakness of the wrist and finger extensors. This study aimed to assess the anatomical feasibility of combining highly selective neurotomy (HSN) of the elbow flexors with a nerve transfer to the radial nerve, with the dual objective of reducing donor muscle hypertonia while restoring motor function in the recipient. Such an approach may also represent a valuable option for individuals with high-level tetraplegia, in whom no transferable muscles are available distal to the elbow.

Methods: Sixteen fresh-frozen cadaveric upper limbs were dissected to establish the feasibility of transferring a motor branch of the biceps or brachialis muscle onto the branch of the extensor carpi radialis longus (ECRL) or an intraneurally dissected radial nerve fascicle. Donor and recipient nerve lengths were measured, and feasibility of tension-free coaptation was assessed. Axon counts were obtained from selected donor and recipient nerves.

Results: Branches to the Biceps muscle were consistently unsuitable for transfer. A direct brachialis-to-ECRL transfer was feasible in 3 of 16 specimens, while transfer to an intraneurally dissected radial nerve fascicle was achievable in all specimens. At least one brachialis branch could be preserved in 15/16 upper limbs, thereby minimizing functional donor muscle deficit. Axon counts demonstrated a favorable donor-to-recipient ratio.

Conclusion: Brachialis-to-radial nerve transfer is anatomically feasible, particularly via intraneural fascicular coaptation, while preserving donor muscle function. This approach may provide a novel option for restoring wrist and finger extension in patients with upper limb spasticity, including selected cases of high-level tetraplegia or brachial plexus palsy.

A-0240 BALANCING HAND FUNCTION THROUGH JOINT PROTECTION: BEHAVIOUR CHANGE TECHNIQUES AND PATIENT CO-DESIGN IN JOINT PROTECTION PROGRAMS FOR HAND OSTEOARTHRITIS

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Introduction: Hand osteoarthritis (HOA) is a common and disabling condition that impairs hand function. Joint protection programs (JPPs) are recommended for reducing pain and deformity and potentially slowing disease progression. At their core, JPPs help individuals balance activity with rest to reduce joint strain while maintaining function. While the use of JPP is supported by clinical trials, currently available programs are outdated, not co-designed and poorly implemented. Behavioural science frameworks and patient co-design methodologies may enhance relevance, adherence, effectiveness, and sustainability.

Aim: This study aimed to map and characterise the behavioural components of JPPs for adults with HOA and to examine the extent of patient co-design.

Material & Methods: We conducted a scoping review with directed content analysis following Arksey and O'Malley's framework. We used PRISMA-ScR reporting guidelines. Six databases and one clinical-trial registry were searched from inception to April 3rd 2025. Eligible studies included randomised trials that included joint protection strategies for adults with HOA. Two reviewers independently coded intervention content using the Behaviour Change Technique Taxonomy version 1 (BCTTv1) and assessed the presence of patient co-design with criteria derived from Experience-Based Co-Design frameworks; discrepancies were resolved by consensus.

Results: A total of 32 studies met the inclusion criteria. We identified 22 unique behavioural change techniques (BCTs) across 11 clusters. "Instruction on how to perform the behaviour" was the most common item (32 studies, 100%), followed by "Behaviour substitution" (23 studies, 72%) and "Restructuring the Physical Environment" (17 studies, 53%). Patient co-design was explicitly integrated in 8 studies, with varying methods and levels of engagement. In most cases, patient input was included during the intervention design stage, while only a few studies involved patients in iterative feedback and refinement. Only one study combined theoretically informed behavioural content with active patient co-design, highlighting a substantial gap in the development of JPPs for HOA.

Conclusions: Most JPPs for HOA incorporate behaviour change techniques but rarely systematically apply behaviour change theory, clearly articulate behavioural change mechanisms or engage patients meaningfully in co-design. Integrating established behavioural frameworks with authentic patient co-design could yield interventions that are both relevant and sustainable. Future program development should embed systematic behavioural theory and genuine patient partnership from conception through refinement to support durable behaviour change in people with HOA.

A-0241 OPTIMIZING COMMUNICATION AND COLLABORATION IN HAND AND WRIST ORTHOPEDIC CARE: A SERVICE BLUEPRINTING STUDY

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Introduction: The WHO Patient Safety Action states that collaboration is essential to meet complex patient needs and strengthen healthcare system performance. Studies have identified barriers such as time pressure, unclear roles, and limited information exchange that undermine teamwork and continuity of care. Our earlier study on patients' experiences found that communication between patients and providers was not always perceived as clear. Patients reported receiving inconsistent information along their care journey and had to repeat their medical history, which caused confusion and delays in treatment. Building on this, the current study explores how providers experience communication and collaboration across care settings and identifies opportunities to improve coordination.

Methods: This qualitative study explored provider perspectives in hand and wrist orthopedics using semi-structured interviews. Participants were selected from provider types mentioned by patients in the previous study, including general practitioners, hand surgeons, and therapists. Some participants were also recruited through snowball sampling, as interviewees suggested additional colleagues involved in the care process. The interviews focused on how providers deliver care across the patient pathway, communicate during referrals, share information, and collaborate across disciplines. All interviews were recorded, transcribed, and thematically analyzed using Braun and Clarke's six-phase framework. Service blueprinting was used to visualize how actions, roles, and information flows connect within and between care providers and organizations. This method revealed multiple levels of collaboration, some visible to patients and others behind the scenes. Combining thematic analysis with blueprinting helped identify where coordination becomes unbalanced with the needs of colleagues, patients and the care system, and how teamwork could be better supported.

Findings: Two preliminary patterns have begun to emerge. (1) Providers said that improving communication with patients is important but difficult because of heavy workload, short consultation times, and insurance constraints. Several noted that referral information is sometimes incomplete and that communication through channels such as Siilo (a secure messaging app), phone, or email can be delayed. In the emerging service blueprint, these issues appear at multiple touchpoints, especially around referral and follow-up, where missing or delayed information disrupts coordination between primary and secondary care. (2) Several providers described a new collaboration model in which general practitioners, hand surgeons, and hand therapists hold weekly or bi-weekly meetings at first-line clinics to discuss complex cases before formal referral. These meetings allow quicker decisions on whether specialist input is needed and may help reduce waiting time for patients. Providers also discussed challenges with electronic patient records. Even hospitals using the same system, such as HiX, do not always share data smoothly. Several mentioned that a national system could improve information exchange but raised concerns about privacy and compatibility.

Conclusion: This ongoing study offers early insights into how providers across the care pathway coordinate decisions, share information, and organize tasks. By combining thematic analysis with service blueprinting, we visualize how actions and services are related in the system. This approach helps identify where the communication and collaboration gaps exist and how they can be redesigned to support more integrated, user-centered care delivery.

A-0242 INTER-VERSION RELIABILITY AND AGREEMENT OF THE BOSTON CARPAL TUNNEL QUESTIONNAIRE AND PATIENT-RATED WRIST EVALUATION: COMPARING THE DECISION TREE-BASED VERSIONS WITH THE FULL VERSIONS

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Introduction: A common strategy to improve patient-reported outcome measures (PROM) response rates and reduce patients' burden is item reduction. We developed shortened decision tree (DT) versions of the Boston Carpal Tunnel Questionnaire (BCTQ) and the Patient-Rated Wrist Evaluation (PRWE), which showed excellent psychometric properties in simulated data. However, their psychometric properties have not yet been evaluated in a real-world clinical setting.

Aim: To evaluate the inter-version reliability and agreement between the full BCTQ and the DT-BCTQ, and between the full PRWE and the DT-PRWE in adult patients with upper extremity peripheral nerve or wrist conditions.

Material & Methods: In this prospective study, we included patients who completed the full BCTQ (score range: 0-5) or PRWE (score range: 0-100 [total score] and 0-50 [pain/function subscales]) as part of their regular care and subsequently completed the DT-BCTQ or DT-PRWE 5-10 days later. Our primary outcome was the inter-version reliability, assessed using intraclass correlation coefficients (ICC). We evaluated the inter-version agreement with Bland–Altman plots, mean differences, and standard error of measurement (SEM), which we compared with the minimally important change (MIC).

Results: A total of 418 patients completed both BCTQ versions, while 119 patients completed both versions of the PRWE. The median completion time for the full BCTQ was 3 minutes and 37 seconds, and for the PRWE, it was 3 minutes and 3 seconds. In comparison, the DT-BCTQ took 1 minute and 4 seconds, and the DT-PRWE took 1 minute and 5 seconds, both showing $\pm 70\%$ reduction in time. For the BCTQ, the inter-version reliability was high, with an ICC of 0.82 (95% CI, 0.79 to 0.85) for the total score, 0.75 (0.71 to 0.79) for the symptom severity scale (SSS), and 0.78 (0.74 to 0.81) for the functional status scale (FSS). For the PRWE, these were 0.88 (0.83 to 0.91) for the total score, 0.78 (0.69 to 0.84) for the pain subscale, and 0.83 (0.77 to 0.88) for the hand function subscale. The agreement between versions was high, with mean differences between the BCTQ and DT-BCTQ of 0.08 (0.04 to 0.12) for the total score, 0.13 (0.08 to 0.18) for the SSS, and 0.02 (-0.03 to 0.07) for the FSS. These were -5.3 (-7.2 to -3.5) on the total score, -3.4 (-4.6 to -2.2) on the pain subscale, and -2.0 (-3.2 to -0.7) on the hand function subscale. All scores followed a normal distribution, and all SEM values were below the MIC threshold. Additionally, Bland–Altman plots indicated no systematic bias.

Demo versions of the DT-BCTQ and DT-PRWE, along with the structure used to implement both PROMs, are available through this link: <https://github.com/Sebas-Peters/DT>.

Conclusions: We found high inter-version reliability and agreement between the full BCTQ and the DT-BCTQ, as well as between the full PRWE and the DT-PRWE. Since the DT-BCTQ and the DT-PRWE are 13 and 9 items shorter and take 70% less time to complete while maintaining good psychometrics, we recommend using the DT versions for both routine outcome measurement and research.

A-0243 GLP-1 RECEPTOR AGONIST USE IN PATIENTS UNDERGOING DISTAL RADIUS FRACTURE SURGERY: A RETROSPECTIVE REVIEW OF PERIOPERATIVE CONSIDERATIONS

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are increasingly prescribed for glycemic control and weight loss, but their effects on surgical outcomes remain incompletely understood. Delayed gastric emptying and associated perioperative risks have prompted updated anesthetic guidelines, though evidence in orthopaedic or hand surgery remains limited.

Aim: This study aims to evaluate the prevalence of GLP-1 RA use and its perioperative implications among patients undergoing surgical fixation for distal radius fractures (DRFs).

Material & Methods: A retrospective review of 4,811 adult patients undergoing operative treatment for DRFs between 2019 and 2024 was conducted. GLP-1 RA use prior to surgery was identified through medication reconciliation. Demographics, comorbidities, medication type, and postoperative complications, including nausea, vomiting, abdominal pain, aspiration, emergency visits, and hospital readmissions, were assessed.

Results: GLP-1 RA use was observed in 46 patients (1.0%) over the 6-year period, with prevalence rising to 2.9% in 2024. Semaglutide was the most commonly used agent. GLP-1 users had significantly higher BMI and higher rates of type 2 diabetes, hypertension, and cardiovascular disease compared to non-users. Only one GLP-1 user (2.2%) experienced postoperative nausea; no cases of readmission, aspiration, or serious complications were documented.

Conclusions: GLP-1 RA use among patients is increasing, reflecting broader prescribing trends. In this cohort, perioperative complications were rare, though underreporting may be a factor. Surgeons should be aware of potential anesthetic considerations, evolving guidelines, and the need for coordinated perioperative planning as GLP-1 use expands.

A-0244 RELATIONSHIP BETWEEN CLEAN HAND SURGERY AND SUBSEQUENT PERIPROSTHETIC JOINT INFECTION: A RETROSPECTIVE ANALYSIS OF NEARLY A THOUSAND PATIENTS

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Introduction: Periprosthetic joint infection (PJI) is a serious and costly complication following joint arthroplasty. PJI can necessitate prolonged antibiotic therapy and revision surgery, which impose substantial burdens on patients and healthcare systems. While PJI has been studied following dental procedures, less is known about the risk from remote surgical procedures, such as with clean hand surgeries, in patients with existing joint implants, and the potential impact of the use of preoperative antibiotics.

Aim: The objective of this study was to determine the incidence and clinical characteristics of PJI in patients with total joint arthroplasties who underwent clean elective hand surgery.

Material & Methods: This study was conducted as a retrospective review of patients from a large academic practice, covering the period from 2015 to 2023. All patients who underwent arthroplasty during this time were identified by specific CPT codes. From this arthroplasty cohort, patients who subsequently underwent any elective hand surgery procedure were identified. This cohort was subsequently evaluated through a detailed chart review to identify surgical reoperations related to PJI. Comparative analyses of patient demographics, comorbidities, antibiotic use, and time intervals were conducted, with statistical significance set at $p < 0.05$.

Results: A total of 971 patients with total joint arthroplasty who also underwent clean elective hand surgery were identified. Of these 2 patients (0.21%) were diagnosed with a PJI. Patients who developed PJI had a significantly shorter interval between arthroplasty and subsequent hand surgery compared to those without infection, 0.23 vs. 2.70 months ($p = 0.0074$). Neither patient received preoperative antibiotics prior to undergoing hand surgery. No significant associations were found between PJI occurrence and baseline comorbidities including hypertension, diabetes, tobacco or alcohol use nor with age or BMI.

Conclusions: Two patients among nearly one thousand patients who underwent clean hand surgery after a prior total joint replacement developed a PJI. The low incidence of the PJI limits determining any particular relationship with clean hand surgery, irrespective of preoperative antibiotic use, and the development of PJI beyond potentially a relationship between a shorter time interval between arthroplasty and subsequent hand surgery. Continued utilization of case by case approach for preoperative antibiotics use before clean hand surgery should be applied.

A-0245 CHANGING TRENDS IN PERIPHERAL NERVE REPAIR: A TWO-DECADE TRINETX ANALYSIS OF GRAFTING TECHNIQUES AND THE ASCENDANCY OF ALLOGRAFTS

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Introduction: Various modalities exist for repairing transected nerves not amenable to primary repair; including, autograft, vein graft, conduit, and allograft.

Aim: The aim of this study was to evaluate trends in the use of different modalities for repairing transected nerves not amenable to primary repair. The study hypothesized that there is increasing utilization of allografts for peripheral nerve repairs.

Material & Methods: The TriNetX Research Network was queried from 2002 to 2022 for all patients undergoing peripheral nerve repair. Demographic information, usage patterns, and comorbidities associated with different grafting methods by CPT were extracted and analyzed.

Results: Out of 33,262 patients undergoing peripheral nerve repair, 31,756 with available demographic data were identified and included. Primary repair cases totaled 17,159, followed by conduit ($n = 9,282$), allograft ($n = 3,582$), autograft ($n = 2,886$), and vein autograft ($n = 353$). Noting that a cpt for an allograft was introduced in 2017, a logistical regression analysis was performed to further sub-analyze allograft usage. The utilization of allografts significantly increased in 2021–2022 compared to 2019–2020, with an odds ratio (OR) of 1.4 (95% confidence interval [CI]: 1.1–1.7; $P = 0.001$), indicating a greater increase compared to autograft utilization during the same interval. The mean per-year rate of change (range) between 2017–2022 for nerve allograft, conduit, autograft and vein autograft was +93.4 (+16.5 to +176.5), +6.3 (-37 to +45), -1.4 (-7.5 to +7.5), and +2 (-2.5 to +6.5), respectively

Conclusions: This study presents a twenty-year analysis of the changing trends in nerve repair and grafting techniques employed by nerve surgeons. Conduit repair has remained a major grafting technique used among surgeons. However, since its introduction, nerve allograft repair demonstrates a consistent positive upward trend in usage within the last 6 years. In contrast, autograft usage has decreased while vein graft usage is least common with a less relevant change in usage. These trends suggest an increasing preference for allograft, potentially displacing other nerve grafting methods, including autografting.

A-0247 UNDERSTANDING EARLY REOPERATION RATES FOLLOWING THUMB BASAL JOINT ARTHROPLASTY

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Introduction: The thumb carpometacarpal (CMC) joint is one of the most common sites for osteoarthritis. It is often treated with basal joint arthroplasty (BJA), a procedure known for high patient satisfaction. Despite this, early reoperations following BJA still occur and remain poorly understood.

Aim: The aim of this study was to gain better insights into the frequency and underlying circumstances around early reoperations to better inform patients and surgeons. The study hypothesis was that the rate of reoperation following BJA surgery is low.

Material & Methods: This is a retrospective cohort study analyzing patient data from 2017–2023 on TriNetX Research Network. The query initially included patients with unilateral thumb CMC arthritis who underwent index thumb BJA and was further refined to include early reoperation. This was defined as any patient who had at least one relevant reoperation within 2 years of the index surgery. Demographics and clinical characteristics were compared; statistical analysis with Z-Test was performed to assess significant differences over the study period.

Results: A query for patients with an index thumb BJA surgery performed during the study period returned 9,853 patients. There was a total of 757 patients having at least one documented additional surgery within 2 years of the index BJA, yielding a reoperation rate of 8%. Among these reoperations, 63% were deemed to involve a revision or reconstructive procedure indicating failure of the index BJA, while the remaining 37% represented accessory surgeries such as cyst excision and tenosynovectomies which may not directly be related to the index BJA. The reoperation group was older and had a higher rate of obesity ($P < 0.05$).

Conclusions: Early reoperation rates following thumb BJA is approximately 8% at 2 years postoperatively, with approximately 5% representing potentially a failure requiring revision of the index surgery. Increasing age and obesity were risk factors for reoperation. Technique-specific reoperation cannot be determined by this study.

A-0248 RESTORING FUNCTIONAL AND MICROVASCULAR BALANCE IN THE HAND AFTER FROSTBITE INJURY WITH SECONDARY RAYNAUD'S PHENOMENON: A CASE OF TOE-TO-FINGER TRANSFER COMBINED WITH PERIARTERIAL SYMPATHECTOMY

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Introduction: The hand's function depends on a delicate equilibrium between skeletal architecture, joint congruency, tendon dynamics, neural coordination, and vascular perfusion. Severe frostbite injuries can profoundly disturb this balance, compromising tissue integrity and autonomic vascular control. While microsurgical toe-to-finger transfers restore structural integrity and motion, persistent vasospastic disorders such as secondary Raynaud's phenomenon may continue to compromise digital perfusion and function.

Aim: We aim to demonstrate how toe-to-finger transfer and staged periarterial sympathectomy influence digital perfusion, vasomotor stability, hand function, and functional and microvascular balance in a patient with severe frostbite and secondary Raynaud's phenomenon.

Materials&Methods: A 40-year-old male sustained bilateral grade 3–4 frostbite after 27 hours of high-altitude exposure at -20°C . Multiple distal amputations were required, including digits III–V of the right hand and all toes of the right

foot. A pre-existing brachial plexus lesion (C3–C5) limited left upper-limb use, making right-hand restoration essential. However, he remained impaired by shortened digits, especially the third, reduced grip strength, and severe secondary Raynaud's phenomenon of all extremities.

In July 2024, a microsurgical free transfer of the second toe from the left foot to the right middle finger was performed using the first dorsal metacarpal artery. The flexor digitorum longus tendon was woven into the proximal flexor digitorum profundus (zone III), and both digital nerves were coapted.

Because secondary Raynaud's phenomenon persisted in the remaining digits and toes, leading to recurrent ischemic episodes, staged periarterial sympathectomies were planned. In October 2025, a right-hand periarterial sympathectomy involving the radial and ulnar arteries, the superficial palmar arch, and the common palmar digital arteries I/II/III and IV/V, combined with tenolysis of the flexor tendon, was performed. A left-foot sympathectomy of the posterior tibial artery and the remaining branches of the dorsalis pedis artery was also successfully completed.

Results: After the toe-to-finger transfer in July 2024, the transplanted digit maintained excellent vascularity despite secondary Raynaud's phenomenon and remained free of vasospasm even during cold exposure. Functionally, the patient regained a stable tripod pinch and, although range of motion was limited, was satisfied with the regained finger length. Secondary Raynaud's phenomenon continued to affect the remaining digits and toes until staged periarterial sympathectomies were performed in October 2025. Following the right-hand sympathectomy involving the radial and ulnar arteries, the superficial palmar arch, and the common palmar digital arteries I/II/III and IV/V, as well as the left-foot sympathectomy of the posterior tibial artery and remaining branches of the dorsalis pedis artery, digital and pedal perfusion normalized for the first 8 postoperative weeks. These findings indicate that combining structural reconstruction with vascular modulation can restore functional and microvascular balance after frostbite injury complicated by secondary Raynaud's phenomenon. In this patient, toe-to-finger transfer re-established biomechanical structure, while periarterial sympathectomy normalized vasomotor tone. The favorable outcome suggests this staged and technically demanding approach may be most effective in highly compliant patients who tolerate extensive reconstruction.

A-0249 SOFT TISSUE COVERAGE IN ORTHOPEDIC SURGERY—THE ROLE OF THE HAND SURGERY UNIT

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Introduction: Soft tissue complications represent a significant challenge in orthopedic surgery, particularly in high-volume centers where complex cases are frequent. Successful management of these cases often requires advanced reconstructive techniques, traditionally associated with plastic surgery

Aim: To evaluate the outcomes and impact of soft tissue coverage procedures performed by the orthopedic hand surgery unit in a tertiary referral center, emphasizing the integration of reconstructive techniques within orthopedic practice.

Material & Methods: A retrospective review was conducted on all soft tissue coverage procedures performed by the orthopedic hand surgery team over a four-year period. Data collected included surgical techniques, indications, and outcomes. Complications were classified as major (total flap necrosis) or minor (partial necrosis or wound healing issues). Descriptive statistics and complication rates were calculated.

Results: A total of thirty-eight procedures were performed:

Skin grafts (n=8): All traumatic wounds healed uneventfully.

Flaps:

- Gastrocnemius muscle (n=10): Primarily for infected prosthetic knees; all survived; 2 required reoperation for infection recurrence.
- Radial forearm (n=3): For hand and elbow defects.
- Sural (n=3): For ankle wounds; 1 total flap

loss managed with negative-pressure therapy and grafting. • Peroneus brevis (n=2): For lateral malleolus exposure post-fixation. • Fasciocutaneous rotation (n=2): For olecranon defects. • Fasciocutaneous bipedicle (n=1): For lateral ankle wound. • Tensor fascia lata (n=1): For trochanteric ulcer. • Latissimus dorsi (n=3): 2 free flaps for distal leg; 1 failure led to amputation. • Free vascularized fibular (n=3): For segmental femoral defects. • [Add the two new flaps and their indications here if needed.] There were two major complications (total flap necrosis: 5.3%) and three minor complications (partial necrosis or need for reoperation: 7.9%), resulting in an overall complication rate of 13.2%.

Conclusions: Soft tissue coverage procedures, while representing a small fraction of total surgical volume, have a critical impact on outcomes in complex orthopedic cases. Centralizing these interventions within the hand surgery unit enabled timely, specialized care with high success rates and low incidence of major complications. These findings support the integration of reconstructive techniques into orthopedic practice and highlight the value of orthoplastic principles in optimizing patient care in high-complexity settings.

A-0250 REVISION TOTAL WRIST ARTHROPLASTY FOR SEVERE EXTENSION CONTRACTURE AND FLEXOR TENDON RUPTURE SIX YEARS AFTER THE PRIMARY PROCEDURE IN A RHEUMATOID ARTHRITIS PATIENT

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Introduction: Total wrist arthroplasty (TWA) is an established surgical treatment for rheumatoid arthritis (RA) to relieve pain and preserve wrist motion. Recent systematic reviews have reported favorable outcomes, with revision rates ranging from 4% to 21%, most commonly due to loosening, infection, or mechanical imbalance related to muscle-tendon tension or implant positioning (Eschweiler et al., 2022; van der Heijden et al., 2020). However, postoperative extension contracture and subsequent flexor tendon rupture are extremely rare. We report a rare case of severe extension contracture associated with index finger flexor tendon rupture requiring revision six years after TWA.

Aim: To describe the clinical course and surgical management of a rare complication of rheumatoid wrist characterized by both extension contracture and flexor tendon rupture following TWA, and to discuss possible underlying mechanisms based on previous literature.

Material & Methods: An 83-year-old woman with rheumatoid arthritis (onset at age 67) had previously undergone tendon transfer and radiolunate fusion 12 years earlier for ring and little finger extensor tendon ruptures. Six and a half years before presentation, she underwent total wrist arthroplasty (TWA) for wrist pain, followed three months later by thumb carpometacarpal arthroplasty using the Epping procedure. . Over time, she developed a progressive wrist extension contracture and noted loss of active index finger flexion approximately XX months before presentation, with a visual analogue scale (VAS) pain score of 80 mm. Preoperatively, wrist motion measured 90° of extension and –65° of flexion. Revision surgery was performed via a volar approach. The radial component stem was removed, the distal radius was shortened by 15 mm, and a new implant was inserted. The flexor digitorum profundus (FDP) tendon to the index finger was found to be ruptured just distal to the stem tip of the radial component and was repaired by end-to-side suturing to the middle finger FDP tendon. The extensor digitorum communis (EDC) was lengthened by 1 cm to reduce extensor over-tension.

Results: At four months postoperatively, pain had resolved completely, and wrist motion improved to 30° extension and 10° flexion. Index finger flexion recovered, allowing light grip function. Radiographs showed stable implant fixation without loosening.

Discussion: The extension contracture was considered to result from decreased wrist flexion strength due to FCR harvest during the Epping procedure, excessive extensor tension after tendon transfer, and release of dorsal restriction following the initial TWA.

The flexor tendon rupture appeared to have resulted from chronic soft-tissue tension associated with the contracture, compounded by long-term mechanical friction between the distal implant edge and the flexor tendons.

This case highlights that while TWA remains an effective treatment for RA wrists, prior tendon procedures and changes in musculotendinous balance can lead to long-term mechanical stress. Careful preoperative evaluation and long-term follow-up are essential to prevent such complications.

A-0251 PERIOPERATIVE MANAGEMENT OF ANTITHROMBOTICS IN CUBITAL TUNNEL DECOMPRESSION: A RETROSPECTIVE ANALYSIS OF BLEEDING COMPLICATIONS

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Introduction: Cubital tunnel syndrome (CuTS) is the second most common compressive neuropathy with an incidence of 30 per 100,000 person-years and a higher occurrence in men and older age groups. Complication rates in cubital tunnel release (CuTR) average around 7.4% and risk of bleeding or post-operative hematoma can be as high as 15%. Although several studies show minimal risk of continuing antithrombotics (AT) in hand and wrist surgery, these studies included few to no cases of CuTR surgeries. As such, there is a paucity of literature on the safety of continuing AT perioperatively for patients undergoing cubital tunnel surgery to guide management decisions. No study has independently examined ulnar nerve decompression with or without transposition in relation to perioperative management of ATs.

Aim: The purpose of this study was to determine the rate of bleeding complications after cubital tunnel release surgeries (to include in situ decompression and transpositions) on patients who are taking antithrombotic medications (AT) at a single, urban, tertiary care referral center.

Material & Methods: Adult patients who underwent operative intervention for cubital tunnel syndrome treated at our center from 2014 to 2024 were included for chart review. Complication rates were compared among those not on antithrombotics (no-AT), those who stopped them preoperatively (stop-AT), and those who continued them perioperatively (cont-AT). Complication rates by antithrombotic status were compared using Chi-square tests, followed by multivariable logistic regression adjusting for demographics, comorbidities, smoking status, and surgery types.

Results: A total of 455 patients were included in this study (351 in no-AT, 16 stop-AT, and 88 cont-AT). The overall complication rate was 48.8%, including wound dehiscence (4.4%), delayed wound healing (2.9%), ecchymosis (2.2%), and hematoma (1.5%). Antithrombotic use was not significantly associated with wound healing or dehiscence complications. However, hematoma rates were higher among anticoagulated patients (0.6% in no-AT, 6.3% in stop-AT, 4.6% in cont-AT for any complication, $p = 0.008$), and this remained significant after adjusting for demographics, comorbidities, smoking status and surgery type ($p = 0.01$). Subgroup analysis indicated the association was limited to in situ decompression (0% in no-AT, 12.5% in stop-AT, and 6.0% in cont-AT for hematoma prevalence; $p < 0.001$), with no hematomas observed in endoscopic decompressions and no significant differences in the transposition groups ($p = 0.859$).

Conclusions: Overall complication rates were similar regardless of antithrombotic status with no significant differences in wound healing or wound dehiscence. While there was a significant increase in hematoma formation among patients receiving AT therapy; there was no significant difference if the patient stopped or continued AT perioperatively. To summarize, bleeding complications in cubital tunnel surgery were uncommon among patients receiving antithrombotic

therapy and occurred even when these medications were held pre-operatively. This suggests that it is safe to continue AT in CuTR without concern for increased rates of postoperative complications.

A-0252 TOXICITIES AND QUALITY OF LIFE FOLLOWING OBSERVATION OR RADIATION THERAPY FOR DUPUYTREN'S DISEASE: THREE YEAR SECONDARY ANALYSIS DATA FROM THE PREVENTION GROUP OF THE INTERNATIONAL DEPART RANDOMIZED TRIAL

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Introduction: Low dose radiotherapy (LDRT) has been used for non-malignant conditions including Dupuytren's disease (DD). The DEPART clinical trial randomized hands to either Observation (Obs) or LDRT to assess impact on disease progression (trial registration ACTRN12618000951257). There is uncertainty regarding toxicities following LDRT.

Aim: To explore the medium term safety of LDRT by reporting toxicity and quality of life (QOL) for the first 36 months of follow-up.

Material & Methods: Key eligibility criteria included a clinical diagnosis of DD, a patient reported history of disease progression over the last six months and written informed consent. Hands were randomized 1:1 to Obs or LDRT to a dose of 30Gy in 10 fractions. Patients were scheduled to be assessed at baseline, 6, 12, 24, 36, 48, 60, 84 and 108 months post treatment, with specific adverse events (AEs) graded (CTCAE v4.03). For QOL, QuickDash, URAM and pain were recorded at baseline and subsequently scheduled for 6, 12, 36, 60, 84 and 108 months. HREC approval: 2018-02-134-PVR-1.

Results: Between 2018-24, 404 hands (202 Obs, 202 LDRT) were randomized, with this analysis therefore focussing on the current median follow-up of 36 months (IQR 24-48). 162 patients experienced an AE (4 obs, 158 LDRT [most commonly dermatitis, reduced sweating and localized oedema]), with 96.6% grade 1 (mild). Of the 14 grade 2 (moderate) AEs recorded to date, only 1 (reduced sweating) persisted up to 24 months. No grade 3 (severe) AEs were reported.

For QOL lower scores translates to less symptoms. Median baseline scores were equivalent between arms, but improved over time across all three tools in favour of the LDRT arm. Median baseline and 36 month scores comparing Obs and LDRT were: QuickDASH (100 point scale: baseline - 12.89 Obs v 12.91 LDRT [p=NS] and 36m - 17.83 Obs v 10.93 LDRT [p=0.013]), URAM (45 point scale: baseline - 3.6 Obs v 3.5 LDRT [p=NS] and 36m - 4.8 Obs v 3.1 LDRT [p=0.056]) and Pain (10 point scale: baseline - 1.7 Obs v 1.8 LDRT [p=NS] and 36m - 2.1 Obs v 1.0 LDRT [p=0.001]).

Conclusions: Multicentre randomized controlled trials assessing radiotherapy for non-malignant conditions are feasible, and critical to establish efficacy and risks. LDRT for DD is well-tolerated, with minimal ongoing toxicities. AEs were expected, mild and largely self-limiting. QOL is possibly improved by LDRT. Follow-up is ongoing to assess longer term AEs, QOL and LDRT's impact on disease control.

A-0253 CARDIOLOGICAL ANALYSIS OF PATIENTS WITH A POSITIVE BIOPSY FOR TRANSTHYRETIN AMYLOIDOSIS IN CARPAL TUNNEL SYNDROME

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Early detection of transthyretin amyloidosis significantly improves treatment effectiveness. Carpal tunnel syndrome is recognized as an early extracardiac manifestation of transthyretin amyloidosis, often preceding cardiac involvement by several years. The objective of this study is to evaluate the cardiological evolution of patients with a positive tenosynovial biopsy for ATTR during CTS surgery.

A continuous cohort of 53 patients (46 men, 7 women; mean age: 72.9 years $\pm$ 5.05 years) was analyzed prospectively. Following a positive biopsy during CTS surgery, a systematic cardiological evaluation including ECG, cardiac ultrasound, and biomarker testing (troponin, NT-ProBNP) was performed. Patients with abnormalities in any of these tests underwent scintigraphy. A diagnosis of cardiac amyloidosis was made in the presence of a positive scintigraphy, and specific treatment was offered to the patient.

During the initial evaluation, four patients (mean age 73 years, all male) were diagnosed with cardiac amyloidosis. Another patient was diagnosed during a 20-month follow-up. Initial abnormalities included elevated biomarkers and moderate myocardial strain abnormalities. Survival without significant cardiac manifestations was 86.6% at 3 years. We found that patients with carpal tunnel recurrence ($p=0.049$) and those who had previously undergone carpal tunnel surgery without biopsy on the first side ($p=0.025$) were statistically significant.

This study highlights the importance of rigorous cardiological follow-up of patients with SCC associated with a positive ATTR biopsy. Given the lack of consensus on the optimal frequency of cardiological follow-up, an annual interval may be proposed in cases where biomarkers or ultrasound are initially normal, and close follow-up every three years for entirely negative cases.

A-0254 TREATMENT OF PYOGENIC FLEXOR TENOSYNOVITIS WITH A 'SIMPLIFIED' ORAL ANTIBIOTHERAPY. A PROSPECTIVE COHORT OF 148 PATIENTS

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Introduction: Fascial cellulitis of the flexors is a common and potentially severe infectious disease. Its treatment is essentially surgical, but there is currently no consensus on the use of antibiotics in the postoperative period. The aim of this study was to evaluate the effectiveness of treatment based on surgery with short-term oral antibiotic therapy, both in terms of infection control and functional outcomes at six months.

Materials and Methods: This was a prospective, observational, non-interventional cohort study. Patients treated for phlegmon of the hand at the Centre de la Main d'Angers, either on an outpatient basis or during a short hospital stay, between November 2, 2022, and October 30, 2024, were included. The treatment protocol combined minimally invasive surgical drainage by irrigation with a single course of postoperative oral antibiotic therapy lasting 7 to 10 days. Six months after the procedure, patients were contacted again to complete a functional assessment questionnaire. We analyzed the effectiveness of the treatment in controlling the infection, the risk factors for failure, and the functional outcomes and their determinants.

Results: One hundred and forty-eight patients were included. All received postoperative oral antibiotic therapy for a

median duration of 8 days, with amoxicillin/clavulanic acid in 142 cases (96%). Treatment was performed on an outpatient basis in 138 cases (93%). The treatment failure rate was 6.8%. Few risk factors for failure were identified, but stage IIB phlegmons were significantly more likely to have an unfavorable outcome ($p = 0.033$). At six months, 86 patients could be reevaluated: 72 (82%) had no significant functional limitation, and 6 (7%) had significant functional limitation. The stage of phlegmon progression ($p = 0.031$) and the time to treatment ($p < 0.001$) were significantly associated with functional limitation.

Conclusion: For stage I and IIA phlegmons, in the absence of drug allergy, outpatient management combining minimally invasive surgical debridement with one week of oral antibiotic therapy with amoxicillin/clavulanic acid appears to be a safe and effective strategy.

A-0255 PREVENTING TREATMENT FAILURE OF THE FIFTH FINGER IN DUPUYTREN'S DISEASE: CRITICAL FACTORS AND SURGICAL STRATEGIES

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Introduction : The fifth finger affected by Dupuytren's disease poses specific challenges related to the risk of IPP stiffness, pseudo-buttonhole dynamics, and recurrence. Beyond technique, the causes of failure include pre- and post-operative communication, overall clinical assessment, and skin planning. This summary identifies the "gateways" to failure and proposes pragmatic solutions.

Methods : Critical narrative analysis of surgical experience and targeted literature, focusing on situations of failure in the management of the little finger, organized into clinical, technical, and follow-up areas. Key elements include patient information, screening for neurological comorbidities, recognition of a strong diathesis, interpretation of the Tubiana and Michon classification, and IPP-IPD biomechanical assessment.

Results : Five groups of failure factors emerge. 1) Insufficient communication: unrealistic expectations, underestimation of residual flexion of 20 to 30° at 6–9 months, lack of awareness of the flare reaction around 1 month and the risk of CRPS, sources of treatment discontinuation. 2) Incomplete assessment: lack of awareness of a progressive diathesis, surgery performed during the active inflammatory phase, reductive interpretation of Tubiana, failure to consider IPD and pseudo-boutonniere. 3) Technical errors: underestimation of skin coverage in extension, vascular and nerve damage. 4) Inappropriate procedure: digital fasciotomy or collagenase for an IPP flexion contracture, extensive arthrolysis transforming the flexion contracture into a swan neck, forced mobilization, trans-IPP broaching. 5) Poor follow-up

Discussion and conclusion : Preventing failure is based on three pillars. First, redundant and documented information distinguishing between correction of deformities and absence of etiological healing, with reasoned acceptance of residual IPP flexion when the initial flexion is significant. Second, a detailed assessment of the IPP-IPD dynamics and diathesis factors to determine the indication and timing. Finally, a surgical strategy prioritizing complete fasciectomy with planned skin coverage, use of open palms and full-thickness skin grafts, and avoidance of procedures with a high risk of instability, all followed by coordinated follow-up and progressive orthotics. In cases of iterative revision or early recurrence, the indication should be reconsidered, or even rescue solutions such as phalangeal amputation in hook forms should be favored.

A-0256 INFLUENCE OF MUSIC ON MICROSURGICAL SUTURING PERFORMANCE IN NOVICE SURGEONS

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Objective: To evaluate the impact of a musical environment on the performance of surgeons undergoing initial microsurgery training.

Materials and methods: Two groups of surgeons performed end-to-end carotid anastomosis on an animal model (rat) in an environment with and without music. The variables studied were obtained from a self-administered questionnaire completed by each participant at the end of each procedure.

Results: When performing microsurgical procedures with music, surgeons felt less physical tension ($p=0.041$), associated with a significantly greater feeling of relaxation ($p=0.011$).

Clamping time was significantly influenced by the quality of the preliminary dissection of the vessel ($p=0.012$), correct manipulation of the instruments ($p=0.019$), and the musical environment during the procedure (0.043).

Discussion: This study suggests that the musical environment can improve the comfort and potentially the performance of surgeons, even when they are just beginning to learn a complex surgical technique. Further studies are needed to support this hypothesis and explore the underlying mechanisms.

Conclusion: Music improves surgical performance by reducing feelings of tension or anxiety in surgeons during a complex procedure, even during the learning phase.

A-0257 DIFFERENTIATING SECONDARY FLEXOR TENDON RUPTURE AND POSTOPERATIVE ADHESIONS AFTER TENORRHAPHY USING SHEAR WAVE ELASTOGRAPHY

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Introduction: After flexor tendon repair, distinguishing between secondary rupture and postoperative adhesions remains clinically challenging, as both present with limited finger motion. Conventional imaging such as B-mode ultrasound or MRI is often inconclusive due to postoperative artifacts. Shear Wave Elastography (SWE) provides quantitative assessment of tendon elasticity, reflecting tendon tension.

Aim: Measuring elasticity in a proximal, healthy segment may help differentiate loss of tension from rupture versus preserved tension in adhesions.

Material and methods: A comparative study was conducted to assess flexor tendon elasticity using SWE. Measurements were obtained in 20 healthy subjects and in 16 postoperative patients, including 8 with secondary tendon rupture and 8 with significant adhesions after flexor tenorrhaphy. Examinations were performed using the Aixplorer Ultimate system (Supersonic Imagine, France), with elastographic values recorded in the longitudinal plane at the palmar level and compared with those of healthy flexor tendons.

Results: In healthy subjects, elastographic measurements showed consistent stiffness with a Shear-Wave Speed (SWS) from 11 to 13 m/s. In patients with secondary tendon rupture, elasticity values during finger extension indicated a complete loss of tension, with a marked decrease in SWS values, between 3 and 6 m/s. Conversely, in patients with isolated postoperative adhesions, elastographic values were comparable to those of healthy tendons, reflecting preserved tension continuity.

Conclusion: Shear Wave Elastography appears to be a reliable, non-invasive method for distinguishing secondary flexor tendon rupture from postoperative adhesions following tenorrhaphy in Verdan zone II. The elastographic profiles of

adherent tendons were comparable to those of healthy tendons, supporting the clinical value of SWE as a complementary diagnostic tool in postoperative tendon assessment.

A-0258 A NOVEL REHABILITATION PROTOCOL FOR THE CONSERVATIVE TREATMENT OF EXTRA-ARTICULAR PROXIMAL PHALANX FRACTURES – DEVELOPMENT AND FIRST CLINICAL EXPERIENCE

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Introduction: The management of extra-articular proximal phalanx (P1) fractures remains a clinical challenge, as optimal hand function depends on the delicate balance between bony alignment, tendon gliding, and joint mobility. Traditionally, the gold standard for treatment has been surgical fixation. However, complications such as extensor lag due to adhesions often compromise hand function and delay return to activity. Consequently, clinical practice has increasingly shifted toward conservative treatment whenever feasible, aiming to preserve the natural interplay of anatomical structures essential for functional recovery.

Methods: To bridge the gap between existing literature and evolving rehabilitation practice, we developed a structured conservative rehabilitation protocol informed by both scientific evidence and extensive clinical experience. The accompanying decision-making algorithm supports therapists and surgeons in determining optimal treatment pathways, selecting appropriate exercises for early controlled mobilization, and applying suitable splints at the right stages of healing to maintain alignment and tendon balance.

Results: Ten patients (mean age 46.7 ± 20.0 years; 50% female) were treated according to the protocol. Eight sustained small finger fractures and two ring finger fractures; nine were base fractures, one a distal fracture. All were extra-articular. Four were oblique and six transverse fractures, out of which six were displaced. Two were multifragmented fractures and another two required closed reduction. All patients were right-handed, with half injuring their dominant hand.

All patients were managed using a midcarpal brace – four in 45° MCP flexion and six in 70°. Three required an additional brace on the injured phalanx to increase fracture stability after reduction or a multifragmented fracture. All patients needed a syndactyly spanning the injured and adjacent P1 for added stability, out of which four patients had a double syndactyly including P2. The mean immobilization time from injury to initiation of hand therapy was 3.8 ± 2.5 days. Treatment lasted an average of 18.8 ± 12.8 weeks, with a mean of 9.2 ± 5.0 therapy sessions per patient.

At therapy completion, all patients reported satisfaction with treatment outcomes. The mean Total Active Motion (TAM) was $270.6^\circ \pm 23.3^\circ$, corresponding to $96.6\% \pm 4.7\%$ of the contralateral side, with six cases showing no extensor lag at the proximal interphalangeal (PIP) joint, one with 2° and three with 10° extensor lag. Grip strength reached $93.6\% \pm 11.8\%$ compared to the unaffected hand.

Conclusion: The conservative P1 fracture protocol has been in continuous clinical use and demonstrates encouraging functional outcomes, high patient satisfaction, and a reliable return to activity. These initial results suggest that conservative management, when guided by a structured rehabilitation protocol, can achieve near-symmetric motion and strength restoration while minimizing surgical risks.

Outlook: A five-year retrospective study comparing conservative and surgical treatment outcomes for P1 fractures is currently underway to further evaluate long-term functional results and the incidence of extensor lag in the PIP joint.

A-0259 FILED TREATMENT INJURIES OF DUPUYTREN'S CONTRACTURE ARE RARE

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Introduction: Dupuytren's contracture (DC) is a common, benign fibroproliferative disorder of the palmar and digital fascia, leading to progressive flexion contractures of the metacarpophalangeal and proximal interphalangeal joints. These contractures disturb the natural balance of extension and flexion that is essential for coordinated hand function. DC is a chronic condition with no definitive cure, and treatment is primarily surgical. Percutaneous treatments are also possible.

Aim: This retrospective study aimed to evaluate the safety of DC's treatments.

Material & Methods: The Finnish Patient Insurance Center (PIC) is the sole authority in Finland that evaluates and compensates treatment-related injuries. We conducted a retrospective study (2010–2023) on compensation claims following DC treatment. The analysis included patient demographics, claim frequency, treatment center classification, surgeon experience, treatment methods, injury severity, claim evaluation, compensation decisions, and preventability. The incidence of treatment-related injuries was calculated, and the injury types were listed.

Results: The incidence of treatment-related injuries following DC surgery in Finland was 3,4 per 1,000 operations. During the 14-year study period, 54 compensation claims were submitted to the PIC. The most common injuries included nerve damage, infection, and recurrence of contracture. Of the 54 claims, 20 were granted compensation, primarily for nerve damage, tendon injuries, amputations, and infections. Among the injuries, 16 out of 66 were retrospectively considered avoidable.

Conclusions: The low incidence of filed treatment-related injuries associated with Dupuytren's contracture (DC) can indicate that DC treatment is safe. It can also show that treatment-related injuries in Dupuytren's contracture are considered more acceptable than those in other conditions, such as operative treatment for carpal tunnel syndrome. Many of these injuries may also remain unreported. Successful DC treatment depends on restoring anatomical and functional balance through precise surgical technique.

A-0260 INVESTIGATION OF THE RELATIONSHIP BETWEEN SMARTPHONE ADDICTION AND HAND GRIP AND PINCH STRENGTH IN HEALTHY UNIVERSITY STUDENTS

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Introduction: Smartphone is the most widely used technological device in young adults today. Excessive use of smartphones is known to cause upper extremity musculoskeletal complications.

Aim: The aim of this study was to examine the relationship between smartphone addiction and hand grip&pinch strength.

Material & Methods: 225 (21.15±9.75; 64% female) healthy university students were included in the study. Smartphone

usage habits of the participants were assessed with the Smartphone Addiction Scale-Short Form (SAS-SF), hand grip was assessed with a hand dynamometer (Jamar®), and pinch grip was assessed with a pinchmeter (Baseline Hydraulic Pinch Gaug®). Statistical analysis was performed with Spearman Correlation Analysis in SPSS v 19.0.

Results: There was found a negative and low level significant correlation between the participants' scores on the SAS-SF dominant hand grip strenght and and both dominant and nondominant hand pinch grip strengths ($p=0.003$, $\rho=-0.416$; $p=0.002$, $\rho=-0.439$; $p=0.007$, $\rho=-0.383$, respectively).

Conclusions: Our study showed that participants with high smartphone use had low gross and pinch grip strength. It should be taken into consideration that muscle weakness due to prolonged phone use may be an important factor predisposing to musculoskeletal injuries involving the upper extremities. In our study, it was found that participants with high smartphone use had low hand and pinch grip strength. We think that smartphone addiction and related muscle weaknesses should be considered as a factor that may predispose to musculoskeletal injuries common in the upper extremities.

A-0261 CLINICAL AND 3-D RADIOLOGICAL OUTCOME OF CORRECTIVE OSTEOTOMY OF DISTAL RADIAL MALUNION USING PATIENT SPECIFIC GUIDES

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Introduction: Despite the increasing use of 3-D planning in corrective osteotomy for distal radius malunion, limited evidence exists on whether the postoperative radiological result accurately reflects the preoperative plan in three dimensions, and how this radiological result affects clinical outcome

Aim: This study assesses whether the postoperative alignment falls within predefined margins of the 3-D planning, evaluates the clinical outcome at three and twelve months postoperative, and the association between surgical accuracy and clinical outcome.

Material & Methods: Twenty patients with conservatively treated distal radial malunion were prospectively included. 3-D bone models were used to quantify the intended correction, performed correction and residual error. A non-inferiority analysis (margin: 5° or 2 mm) compared intended and performed correction across all degrees of freedom. Surgical improvements in alignment were assessed using paired t-tests between intended correction and residual error. Clinical outcomes (range of motion, grip strength, PRWHE and NPRS) were evaluated at baseline, 3 and 12 months, using ANOVA tests and t-tests. Pearson correlation was determined between residual error and both range of motion and PRWHE score. Results: Non-inferiority was observed in dorsopalmar and mediolateral translation, but not in other directions or rotations. Significant postoperative alignment improvements were seen in all directions except mediolateral translation. All clinical outcomes improved significantly. Correlations between residual error and clinical outcome were weak and nonsignificant. Conclusions: Although differences between intended and performed correction often exceeded 5° or 2 mm, 3-D guided corrective osteotomy of the distal radius resulted in significant improvements in functional and patient reported outcome.

A-0262 NERVE SUPPLY OF THE THUMB CARPOMETACARPAL JOINT: ANATOMICAL FINDINGS RELEVANT TO DENERVATION SURGERY

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Introduction: Denervation for thumb carpometacarpal (CMC) osteoarthritis has attracted attention as a minimally invasive procedure that requires no postoperative immobilization. However, previous anatomical studies have reported inconsistent patterns of neural supply to the thumb CMC joint, and the surgical technique has not yet been standardized. A clearer understanding of the periarticular innervation is therefore necessary.

Aim: This study aimed to systematically clarify the neural supply around the thumb CMC joint and to provide foundational data for standardizing denervation procedures.

Material & Methods: Eight fresh-frozen upper limbs were examined. Seven nerves were anatomically traced to identify branches supplying the thumb CMC joint: the superficial branch of the radial nerve (SBRN), the lateral antebrachial cutaneous nerve (LACN), the thenar motor branch of the median nerve (TBMN), the palmar cutaneous branch of the median nerve (PCBMN), the anterior interosseous nerve (AIN), the posterior interosseous nerve (PIN), and the deep branch of the ulnar nerve (DBUN). All dissections were performed by a single investigator under 2.5× loupe magnification. Structures that were macroscopically difficult to differentiate were evaluated histologically to confirm neural tissue.

Results: Three distribution patterns of SBRN and LACN were identified. The SBRN-dominant pattern, in which SBRN supplied both the radial and ulnar dorsal aspects of the joint, was observed in four specimens (50%). The co-dominant pattern, in which the radial side was supplied by LACN and the ulnar side by SBRN, was found in two specimens (25%). The LACN-dominant pattern, in which LACN supplied both sides, was also seen in two specimens (25%).

In the SBRN-dominant pattern, two subtypes of terminal LACN branches were noted: a palmar subtype running from the volar wrist toward the volar surface of the trapezium (two specimens), and a dorsal subtype running deep to the first extensor compartment toward the STT joint (two specimens). In the co-dominant pattern, LACN branches arose 38.9 mm (34.5–43.3) proximal to the radial styloid and coursed dorsally toward the STT joint, similar to the dorsal subtype. In the LACN-dominant pattern, no additional branches arising from the LACN trunk were observed.

TBMN remained within the thenar muscles in all specimens, with no clear supply to the CMC joint. PCBMN sent a branch to the volar trapezium in two specimens (25%). AIN, PIN, and DBUN showed no branches to the joint in any specimen.

Conclusion: The thumb CMC joint was mainly supplied by SBRN and LACN, and their distribution could be classified into three distinct patterns. These anatomical findings clarify the sensory innervation around the joint and provide useful baseline information that may assist in the clinical application of denervation procedures.

A-0263 A COMPARISON OF COSTS AND ENERGY EXPENDITURE DURING COMMON HAND SURGERY OPERATIONS PERFORMED IN THE OPERATING THEATRE VERSUS PROCEDURE ROOM AT THE SURGICAL WARD

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Introduction: The health care sector is the fifth largest contributor to greenhouse emissions globally. Results of several studies have demonstrated that altering surgical practices from inpatient to outpatient service was associated with cost savings, reduction of medical waste and energy expenditure.

Aim: Comparison the costs of materials and energy expenditure at common hand surgery operations performed in the operating theatre and in a ward procedure room settings.

Material & Methods: The analysis included the cost of materials, cost of sterilization of surgical instruments and energy expenditure for sterilization generated at standard hand surgery operations, including, carpal tunnel release, surgery for Dupuytren's disease, benign tumor and ganglion cyst excision, de Quervain's disease, or trigger finger release.

Results: Typical hand surgery operations performed in a procedure room at the surgical ward generated lower costs (amounting to 53% of main theatre costs), 1 kg less clinical waste and were associated with significant (67%) reduction in energy expenditure compared to surgeries performed in the main operative theatre.

Conclusions: Altering of organization of doing surgeries in a ward procedure room instead of the main operative theatre was associated with a significant positive effect on economy and environment.

A-0264 AN ASSESSMENT OF IMPORTANCE OF A PAIN AND GRIP STRENGTH AS THE MOST ACCURATE PREDICTORS OF THE OUTCOME OF THE TREATMENT OF DISTAL RADIAL FRACTURES

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Introduction: Distal radial fractures are common injuries, accounting for around 25% of fractures in the paediatric population and up to 18% of all fractures in the elderly age group. Outcome assessment of treatment of these fractures includes objective measurements of wrist joint range of motion and grip strength, as well as subjective parameters such as intensity of perceived pain, hand function and quality of life. In the last years a trend was observed to use numerous outcome measures for more comprehensive evaluation of the results of the treatment.

Aim: To investigate whether the assessment of pain severity and grip strength is sufficiently accurate for correct assessment of the outcome of the treatment of distal radial fractures.

Material & Methods: One-hundred and two patients, 79 women (77%) and 23 men (23%) with a mean age of 54 years with distal radial fractures were treated operatively. The results of the treatment were assessed at 3 and 6 months by measurements of intensity of pain (in numeric rank scale, NRS), grip strength (with dynamometer) and hand function with the DASH questionnaire. The results of these measurements were compared in order to investigate the strength of the possible correlation between variables.

Results: An analysis of the correlation between considered variables at 3, and 6 months assessment showed statistically significant correlation (Spearman rank test, $R=0,26-0,41$; $p<0,01$). The NRS correlated negatively with grip strength (less pain - greater strength) and positively with DASH scores (less pain - better hand function). Correlation between grip strength and the DASH was the strongest (Spearman rank test $R=0,61$; $p<0,001$, showing that greater power of the hand indicated better function, whereas weaker grip indicated worse function).

Conclusions: Knowledge of 2 symptoms - the severity of pain and weakness of the hand is sufficient for accurate assessment the outcome of distal radial fracture treatment. These both variables appeared to be (independently of each other) very well correlated with more comprehensive assessment of hand function using the DASH questionnaire.

A-0265 THE JUSTIFICATION FOR ANTIBIOTIC PROPHYLAXIS IN OPERATIVE TREATMENT OF HAND AND WRIST BONE FRACTURES: A REVIEW

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Introduction: Although there is no clear scientific evidence justifying antibiotic prophylaxis in operative treatment of hand and wrist bone fractures, it is commonly used, mostly due to the concern about possible medicolegal problems caused by bone infection after surgery

Aim: A review of literature on the justification for the use of antibiotic prophylaxis in surgical treatment of hand and wrist fractures.

Material & Methods: A review of the published literature from PubMed and Medline databases on the antibiotic prophylaxis in fractures of hand (phalangeal, metacarpal and carpal) and forearm bones. A randomized clinical trials, observational studies, systematic reviews and meta-analyses reporting on use of antibiotics in surgical treatment of hand and forearm fractures in adult patients were reviewed.

Results: For operative treatment of hand fractures 3 studies and one systematic review were found. All these articles indicate a lack of scientific evidence to justify the routine administration of antibiotics in these injuries. For operative treatment of distal radial fractures only 1 study was found suggesting that antibiotic prophylaxis does not affect risk of infection. Further literature review showed that redundant antibiotic use may be associated with harmful and adverse effects, as well as with substantial costs.

Conclusions: Current scientific evidence does not support routine use of antibiotic prophylaxis in operative treatment of hand and wrist bone fractures. Antibiotic administration in these operations has not effect for decreasing infection rate and therefore can be safely avoided.

A-0266 WALANT ANAESTHESIA IN HAND SURGERY: AN ANALYSIS OF ADVERSE EVENTS AND COMPLICATIONS

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Introduction: Assistance of anaesthesiologist is considered inseparable element at most surgical procedures, except of minor operations performed under local anaesthesia. In hand surgery, most of operations, can be done under regional (brachial plexus block) or local (infiltration) anaesthesia. These procedures can be done by surgeons themselves what allows operating without assistance of anesthesiologist.

Aim: An analysis of efficacy and safety of anesthesia to operations in hand surgery performed by surgeons, without assistance of anesthesiologists.

Material & Methods: This analysis was based on records of anesthesia protocols filled by surgeons who performed the procedure and who operated on the patients. The following variables were considered: efficacy of anesthesia, adverse effects associated with anesthesia and complications.

Results: Over a period of 10 years (2013-2022), a total of 15 683 operations were done, of this number 5638 (34%) under anesthesia performed by surgeons, without assistance of anesthesiologists. Efficacy of these procedures (local and brachial plexus blocks) was 98%. A total of 203 (3,6%) adverse reactions were noted associated with anesthesia, most of them transient, requiring emergency intervention and without serious consequences. In only 12 cases (0,02%) adverse effects caused cancellation and postponing of scheduled operation.

Conclusions: Anesthesia for operations in hand surgery performed by surgeons themselves and without assistance of anesthesiologists is effective, safe and is associated with numerous benefits for patients, surgeons and budget of medical care system

A-0267 PAIN CONTROL IN CHRONIC, REFRACTORY CRPS BY CONTINUOUS BRACHIAL PLEXUS ANALGESIA

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Introduction: Some CRPS patients develop a specific subtype of the condition called “chronic, refractory CRPS”. This form is characterised by severe pain and other painful phenomena (hyperpathia, allodynia), need for regular analgesic consumption, severe functional impairment of the affected extremity and no- or poor responsiveness to the treatment. No effective standard treatment is known that allows medium-term freedom from pain in these patients. In this situation, a continuous brachial plexus analgesia may offer some benefit (“a last chance” treatment

Aim: Analysis of outcomes of treatment of chronic, refractory CRPS by continuous brachial plexus analgesia

Material & Methods: We report outcomes of treatment for severe pain associated with long-standing, refractory CRPS in 10 female patients by continuous brachial plexus analgesia. Duration of the disease prior to treatment was 3.5 years on average and baseline pain intensity was a mean of 8.3 in NRS. All patients met the Budapest criteria of CRPS diagnosis. Spinal catheter was implanted into the brachial plexus via open axillary approach.

Results: Each patient had performed a mean of 4.4 (range 2-8) spinal catheter implantations. Rapid and strong analgesic effect was obtained immediately after beginning of injection of bupivacaine solution: pain decreased from a mean of 8.3 to 1.6. Duration of maintaining the catheter in the brachial plexus and effective analgesia was 5.3 months (range 2-12). After removal of the catheter the pain returned to baseline. No patient obtained permanent or at least partial reduction of her pain after completion of this therapy.

Conclusions: The reported technique is typically palliative and does not resolve problem of the pain over a longer perspective. However, although all patients returned to their baseline situation, the relatively long period of being free from intractable pain was considered by them to be priceless. We believe that presenting this study will contribute to current knowledge about treatment options for the most severe, “hopeless” cases of CRPS.

A-0268 IS THE ROUTINE HISTOPATHOLOGICAL EXAMINATION OF ALL TUMORS AT THE UPPER EXTREMITY JUSTIFIABLE?

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Introduction: Most lesions of the upper extremity are common and benign, and many have questioned the need for routine pathology evaluation of these specimens.

Aim: Evaluation of the accordance of initial clinical and final histological diagnoses of tumours which clinical presentation and intraoperative findings indicated that they are most likely benign or malignant, and answer the question the routine histopathological examination of all tumours at the upper extremity justifiable.

Material & Methods: The results of histopathological examination of benign tumours resected in 346 patients, and malignant tumours resected in 6 patients were analysed.

Results: An analysis showed 100% accordance between initial (clinical) diagnoses of the tumours as benign or malignant and their final histopathological diagnoses. Only in 12 cases (3,5%) of initially benign tumours their clinical presentation and/or intraoperative findings raised doubts.

Conclusions: The results of this study show that routine histological evaluation of all tumours resected from the upper extremity is not justifiable, and may be confined to selected cases in which clinical presentation and/or intraoperative findings raise doubts

A-0269 EFFICACY OF PEDICLED ADIPOSE FLAP TRANSPLANTATION FOR FINGER EXTENSOR TENDON ADHESIONS

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Introduction: Adhesion of the extensor tendon at the proximal phalanx, which typically occurs after proximal phalanx fractures, often recurs even after detachment surgery.

Aim: To prevent re-adhesion after tendon detachment, we performed pedicled fat flap transplantation using the perforating branches of the dorsal metacarpal artery as the vascular pedicle. This study reports our clinical outcomes with this technique.

Materials and Methods: Between January 2018 and May 2023, 22 patients underwent pedicle fat flap transplantation for extensor tendon adhesions at the proximal phalangeal and metacarpophalangeal (MCP) joints. The cohort comprised 15 males and seven females, with a mean age of 55.3 years. The affected digits were the thumb in three cases, index finger in three cases, middle finger in three cases, ring finger in one case, and little finger in 12 cases. Causes of adhesions included proximal phalanx fractures (10 cases), metacarpal fractures (seven cases), MCP joint dislocations (one case), infectious tenosynovitis (one case), and extensor tendon rupture (one case). The mean postoperative follow-up period was 28.9 weeks. **Surgical technique:** The extensor tendon was first incised longitudinally at the center from the MCP joint level to the proximal interphalangeal (PIP) joint insertion, followed by tendon detachment. When MCP or PIP joint contractures were present, joint mobilization was performed concurrently. To prevent postoperative re-adhesion, a pedicled fat flap including the cutaneous vein was elevated using a perforating branch of the dorsal metacarpal artery adjacent to the affected finger as the nutrient vessel. The flap was then passed proximally beneath the extensor tendon at the dorsal expansion hood and interposed between the central slip and the proximal phalanx.

Results: Flexion limitations of the thumb interphalangeal joint improved in all three cases. Active extension disorder improved in one case but remained unchanged in the others. Among the index to little fingers, MCP joint flexion disorder improved in seven cases, was unchanged in one case, and worsened in three cases. Active MCP joint extension disorders improved in one case, remained unchanged in one case, and deteriorated in one case. PIP joint flexion disorder improved in eight cases and was unchanged in one case, while active extension disorder improved in eight cases, remained unchanged in one case, and worsened in four cases.

Conclusion: The clinical outcomes of pedicled fat flap transplantation for preventing re-adhesion were generally favorable. Pedicled fat flap transplantation appears to be an effective surgical option for managing recurrent adhesions following detachment.

A-0271 MID-TERM CLINICAL AND RADIOLOGICAL OUTCOMES OF TIGHTROPE USE IN THE MANAGEMENT OF CARPOMETACARPAL JOINT ARTHRITIS OF THE THUMB

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Introduction: Arthritis of the first carpometacarpal joint is a common degenerative condition leading to pain, weakness, and functional impairment, particularly in middle-aged and elderly patients. Various surgical techniques have been described following trapeziectomy, aiming to restore stability and thumb function. Button suspensionplasty using the TightRope system represents a minimally invasive alternative designed to maintain first metacarpal height and allow early mobilization.

Aim: The aim of this study was to evaluate the mid-term clinical and radiological outcomes of button suspensionplasty using the Mini TightRope fixation system for the surgical management of thumb carpometacarpal joint arthritis.

Material & Methods: A prospective study was conducted including 18 patients (13 women and 5 men, mean age 63 years) with Eaton–Littler stage II–IV thumb base arthritis who underwent complete trapeziectomy followed by suspensionplasty using the CMC Mini TightRope® Fixation System (Arthrex). Postoperative assessment included Quick DASH and VAS scores, grip and pinch strength measurements, and patient satisfaction. The mean follow-up period was 14 months. Final radiological evaluation assessed the scaphoid–first metacarpal distance to determine any metacarpal subsidence.

Results: The mean operative time was 28.7 ± 10.2 minutes. Patients demonstrated significant improvement in pain and function at final follow-up. The mean Quick DASH score improved from 48.2 preoperatively to 14.3, and the mean VAS score from 7.1 to 1.9. Grip strength increased from 13.8 kg to 21.5 kg, and pinch strength from 2.4 kg to 5.2 kg. Return to basic daily activities occurred at an average of 6 weeks postoperatively. Overall patient satisfaction was high, with no major complications. One patient developed mild thumb stiffness, managed conservatively without need for revision surgery. No radiographic subsidence of the first metacarpal towards the scaphoid was observed in any case.

Conclusions: Button suspensionplasty with the Mini TightRope system is a safe and effective surgical option for the treatment of thumb carpometacarpal arthritis. It provides excellent mid-term functional outcomes, rapid postoperative recovery, and high patient satisfaction, with minimal risk of complications or metacarpal collapse.

A-0272 ULNAR-SIDED PLATE FIXATION FOR FIFTH METACARPAL NECK FRACTURES: A CLINICALLY EFFECTIVE ALTERNATIVE TO INTRAMEDULLARY PINNING

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Introduction: Ulnar sided plate fixation provides rigid stabilization for fifth metacarpal neck fractures and allows early mobilization, but possible interference with the ulnar collateral ligament may restrict motion. This study retrospectively compared postoperative outcomes of ulnar-sided plate fixation and intramedullary pinning.

Methods: Seventeen patients (Group L) underwent ulnar locking plate fixation and fifteen patients (Group F) underwent intramedullary pinning using the Foucher technique. Postoperative motion of the small-finger metacarpophalangeal

(MP) joint, total active motion (TAM), Hand20 score, and complications were compared. Within the Group L, five patients had plates placed distal to the collateral ligament insertion (Group D) and were compared with proximal placement cases (Group P).

Results: Mean postoperative MP extension/flexion was 6.1° / 69.8° in the Group L and 9.5° / 69.9° in the Group F, and TAM was 223.4° and 227.1° , respectively; no significant differences were found. Hand20 scores averaged 8.4 (Group L) and 10.5 (Group F). All cases achieved bony union. Two cases of screw back-out occurred in the Group L and two shortenings in the Group F. Distal plate placement did not cause motion loss compared with proximal placement. Interestingly, screw back-outs occurred only in the Group P.

Conclusions: Ulnar-sided plate fixation achieved postoperative range of motion and patient-reported outcomes equivalent to intramedullary pinning. Insufficient fixation due to proximally placed plates may lead to screw loosening. Even when plates extend distally beyond the collateral ligament insertion, no functional loss was observed. Although limited by small sample size and retrospective design, ulnar-sided plate fixation appears a useful option for fifth metacarpal neck fractures requiring strong stabilization.

A-0273 DISTAL BICEPS BRACHII TENDON RUPTURES: EPIDEMIOLOGY, OPERATIVE TREATMENT TECHNIQUES AND FUNCTIONAL OUTCOMES BASED ON A SINGLE CENTER EXPERIENCE

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Introduction: Distal biceps brachii tendon ruptures represent a relatively common traumatic pattern, particularly in middle-aged men performing manual labor or high-resistance activities. The injury typically occurs during eccentric loading of the flexed elbow and leads to weakness in forearm supination and elbow flexion. Although several fixation methods have been described, the optimal surgical technique remains under debate, with limited comparative data on long-term functional outcomes.

Aim: The purpose of present study was the collection and analysis of epidemiological data, operative techniques and clinical outcomes of distal biceps tendon ruptures based on a single, level I trauma center experience.

Material & Methods: Patients with distal biceps brachii rupture, treated operatively, between 2014 and 2023, were retrospectively reviewed. Medical archives were studied and epidemiological data, surgical techniques including details concerning reattachment methods and perioperative complications were recorded. Patients were reviewed clinically, and range of elbow motion, early/late complications, and functional outcomes were documented. Chronic ruptures and patients with follow-up less than 18 months were excluded.

Results: The study included 45 patients with distal biceps rupture treated operatively, between 2014 and 2023. 42 patients were male and 3 females, with mean age of 41.6 years and the dominant limb affected in 82.9% of cases. Thirty-three (73.3%) were treated with suture-anchor distal biceps reattachment, 7 (15.5%) were treated with transosseous – pull out sutures, and 5 (11.1%) with cortical button fixation. In 2 cases of subacute ruptures and suboptimal tendon composition, a semitendinous autograft was also used for augmentation with transosseous – pull out suture fixation. No cases of neurovascular complications or deep infections were recorded. Two cases of re-rupture and two cases of persistent stiffness were recorded. The three cases were related to acute ruptures treated with suture-anchor distal biceps reattachment whereas one case of postoperative stiffness was related to button fixation. The remaining patients

(41/45) had painless, functional range of motion, and returned to daily activities, without significant compromise, at 2.5 months post-operatively. Return to sports was possible in a mean period of 4 months after the procedure. No significant difference was found between the reattachment technique and the functional level.

Conclusions: Operative treatment for distal biceps brachii ruptures results in satisfactory functional outcome with low complication rate, regardless of fixation technique used. Cases of re-rupture or persistent stiffness noted in present study were related to acute ruptures treated with suture-anchor distal biceps reattachment.

A-0274 SUBACROMIAL BALLOON SPACER COMBINED WITH MINI-OPEN REPAIR FOR MASSIVE ROTATOR CUFF TEARS PROVIDES SUPERIOR EARLY FUNCTIONAL RECOVERY: A PROSPECTIVE COMPARATIVE STUDY

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Introduction: Massive rotator cuff tears remain a challenging condition, often associated with pain, pseudoparalysis, and significant functional limitation. Various surgical options have been proposed for patients with irreparable or partially repairable tears, but postoperative stiffness, pain, and delayed recovery are common. The use of a subacromial balloon spacer has emerged as an adjunct to restore humeral head depression and improve shoulder kinematics. However, comparative data regarding its effectiveness when combined with mini-open partial repair are still limited.

Aim: The purpose of this study was to compare the clinical outcomes of mini-open partial rotator cuff repair performed with or without subacromial balloon spacer implantation in patients with irreparable massive posterosuperior tears.

Material & Methods: Between 2019 and 2023, thirty patients with symptomatic massive posterosuperior rotator cuff tears underwent mini-open partial repair using suture anchors. Patients were divided into two groups: Group 1—partial repair combined with balloon spacer implantation (n = 15) and Group 2—partial repair alone (n = 15). Clinical evaluation included the Constant score, American Shoulder and Elbow Surgeons (ASES) score, Oxford Shoulder Score (OSS), pain visual analogue scale (VAS), and active range of motion (ROM) in flexion and abduction. Assessments were performed preoperatively and at 3, 6, 12, and 24 months postoperatively. Complications and re-tear events were documented. Statistical analysis was performed with significance set at $p < 0.05$.

Results: Both groups demonstrated statistically significant improvement across all clinical parameters compared with baseline ($p < 0.001$). However, patients in Group 1 showed superior early recovery. At 3 months, Constant and ASES scores were significantly higher and VAS pain scores significantly lower in Group 1, with more rapid improvement in active forward elevation ($p = 0.01–0.04$). At 6 months, Group 1 maintained higher mean values in all outcomes, although differences were not statistically significant. At 12 and 24 months, functional and pain outcomes were equivalent between groups. One superficial infection and one balloon migration were recorded in Group 1, and one superficial infection in Group 2. Two re-tears occurred (one in each group), but no patient required reoperation for any reason.

Conclusions: In patients with massive but partially repairable rotator cuff tears, combining a subacromial balloon spacer with mini-open partial repair results in faster early functional recovery and pain relief compared with partial repair alone, while maintaining equivalent mid-term outcomes.

A-0275 THE MALLET THAT BECAME A SWAN - MANAGING AND RE-BALANCING CHALLENGING FINGERS

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Introduction: A rupture in the terminal extensor of a finger is a common injury, leading to a disruption in the biomechanics and balance in the finger. Unless these injuries are assessed and managed correctly, pain and deformity can develop with loss of biomechanical balance and hand function. A reasoned conservative management is found to be effective in supporting biomechanical integrity, reducing pain and enhancing functional return.

Case presentation: A 70 year old male presented with an extremely painful Swan neck and Mallet deformity of his middle finger. He reports having injured the finger 3 months prior and had attempted self-management of the mallet injury with an off the shelf splint.

On initial assessment he presented with full comparable mobility of the metacarpal phalangeal joint (MPJ), hyper-extension to +14 degrees of the proximal interphalangeal joint (PIPJ) and extension lag of the distal interphalangeal joint (DIPJ) of – 40 degrees and -20 degrees passively. Pain was moderate at rest and significant on palpation and movement, with notably restricted passive PIPJ flexion possible. Radiographic imaging reported no fractures and a stable satisfactory joint. He had a natural tendency to swan neck in both hands.

Despite the obvious mallet deformity, the painful swan neck deformity received priority management. After the application of heat, gentle massage and passive exercising, the PIPJ was splinted in a dorsal blocking post through lever style splint, supporting the PIPJ in maximum comfortable passive flexion, whilst allowing active flexion exercising with the DIPJ supported in maximum passive extension. This style splint was maintained for a total period of nine (9) weeks with regular splint and therapy reviews, encouraging active PIPJ flexion. During the initial treatment period, progressive improvement in mobility and pain reduction was noted with range of movement at the nine (9) week mark noted as follows: MPJ 0/86, PIPJ +10/88, DIPJ -15/46, with full passive DIPJ extension possible. A cautious phasing down period of twelve (12) weeks of protective splinting was commenced with removal for hygiene and gentle active exercise. During this period, splinting was changed to a PIPJ dorsal blocking splint to prevent hyper-extension during the day and a static DIPJ extension splint for night use. At this point, range of movement was noted as follows: MPJ 0/84, PIPJ +15/94, DIPJ -20/68, with full passive DIPJ extension possible. A self-directed programme was then followed, with progressive phase out of all splinting, as movement was pain free and comfortable and he had returned to all required functional activities.

Conclusion: This case study highlights a significant and painful swan-necking post a soft tissue mallet injury in a hand with volar PIPJ laxity. There is little discussion in the literature relating to this type of presentation with the need to review and further understand both the normal biomechanical processes and the domino effect of trauma on the finger with volar joint laxity. It highlights the need for vigilance, biomechanical understanding, effective & innovative splinting and patient-centric management in supporting a return to functional independence.

A-0277 ANCHOR VS SUTURE REPAIR FOR ACUTE ULNAR COLLATERAL LIGAMENT INJURY OF THE THUMB: A COMPARATIVE CASE SERIES

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Introduction: Ulnar collateral ligament (UCL) injury of the thumb is a common sporting injury. Acute surgical intervention for complete injuries is important to prevent pain, joint instability and degeneration. However, there is limited comparative study of surgical repair methods.

Aim: To perform a comparative case series of micro-anchor repair (AR) vs. suture repair (SR) for acute thumb UCL injury. **Material & Methods:** Over an 8-year period, 76 patients were identified with surgically treated unilateral UCL injuries. Patients were treated by four surgeons, with a standardised four weeks of immobilisation and hand therapy post-operatively. All clinical and hand therapy notes were reviewed, with patients invited to complete a Patient Evaluation Measure (PEM). Statistical analysis was performed with SPSS via two-tailed T-Testing.

Results: Mean age was 41 with 45 male patients and 20 manual workers. Sporting injury accounted for 32 cases, affecting the dominant hand in 65%. There were 28 avulsion fractures. Mean time to surgery was six days (Range 1 - 17).

Overall, 42 patients underwent micro-anchor repair and 34 suture repair. There was no difference in complications or symptomatic laxity. Complications included neurapraxia (n=9), stiffness (n=7) and infection (n=1). Four patients had persistent laxity being offered fusion (AR =2 vs. SR =2). Mean Kapandji score was 8.2 for AR and 7.9 for SR (p=0.484).

PEM was completed by 27 patients. Mean PEM follow up was 67 months. Two outliers were excluded due to base of thumb arthritis leaving 11 AR and 14 SR. Mean PEM part two score was 17.1 AR vs. 17.3 SR (p=0.008)

Pinch grips were available for 10 AR and 11 SR patients. Key pinch was 82% for AR vs. 78% for SR, Tripod pinch was 81% for AR vs. 94% for SR, Tip-pinch was 80% for AR vs 93% for SR, with no statistical differences.

Conclusions: Both anchor and suture repair are effective surgical options for acute UCL injuries of the thumb, providing satisfactory stability and function with low complication rates. No significant differences were identified in clinical outcomes. Suture repair can be considered safe, quick and cost effective. While anchor repair may offer marginal benefits in patient reported outcomes and facilitate early mobilisation. Early surgical intervention remains key to optimal recovery, emphasising the importance of timely diagnosis and management.

A-0278 COMPARISON OF PROPRIOCEPTIVE SENSE, GRIP STRENGTH, WEIGHT BEARING, ISOKINETIC MUSCLE STRENGTH, REACTION TIME AND FUNCTIONAL PARAMETERS BETWEEN SUBJECTS WITH SCAPHOLUNATE INSTABILITY AND HEALTHY INDIVIDUALS: A CROSS-SECTIONAL STUDY

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Introduction and Aim: The aim of this study was to compare proprioception, pain, grip strength, weight-bearing capacity, isokinetic muscle strength, reaction time, and functional parameters of the hand in patients with scapholunate instability with those of healthy controls, and to evaluate the flexor–extensor muscle balance of the forearm.

Material & Methods: This observational study included 21 patients with dynamic scapholunate instability (SLI) and 21 age- and sex-matched healthy controls at the Orthopedics and Traumatology Outpatient Clinic of Istanbul University. Diagnosis was confirmed by clinical and MRI findings. The primary outcome was wrist proprioception, measured using a validated Humac Norm CYBEX dynamometer at 30° flexion and 30° extension. Secondary outcomes included pain (assessed using the Visual Analog Scale at rest, during activity and exercise), range of motion (ROM), grip strength, weight-bearing tolerance (WBT), isokinetic peak torque (PT) and endurance (TWD) (assessed using CYBEX dynamometer), reaction time (Blazepod), and functional outcomes (Patient Rated Wrist/Hand Evaluation (PRWHE) and QuickDASH. Each test was

performed bilaterally under standardized conditions. All measurements were performed bilaterally under standardized conditions by a physiotherapist.

Results: Demographic characteristics were similar between groups ($p > 0.05$). All patients were right-hand dominant, and right hand was affected in every cases. Compared to controls, the SLI group demonstrated significantly impaired proprioception ($p < 0.001$), reduced wrist ROM across all planes ($p < 0.001$), and lower WBT ($p < 0.001$). Grip strength was slightly lower in the SLI group, but not significant ($p = 0.237$). Isokinetic testing revealed markedly reduced PT and TWD in both flexion and extension, normalized to body weight ($p < 0.01$). Reaction time indicated a lower number of taps and prolonged reaction times in the SLI group ($p < 0.001$). Within-group analysis also showed significant side-to-side differences, with the affected wrist exhibiting reduced proprioception, limited ROM (except radial deviation), lower WBT capacity, flexion endurance, and slower reaction times compared with the unaffected side ($p < 0.05$). PRWHE and QuickDASH were significantly higher in the SLI group ($p < 0.001$), indicating greater pain and disability. Flexion PT and TWD were significantly higher than extension in both affected and unaffected wrists ($p < 0.01$). This flexor–extensor imbalance was more pronounced on the affected side, reflecting greater impairment of wrist extensors and a persistent flexor-dominant pattern in individuals with SLI.

Conclusions: Overall, patients with SLI demonstrated substantial neuromuscular and functional deficits compared with healthy controls. They exhibited impaired proprioception, reduced wrist mobility, weight bearing, strength, endurance, prolonged reaction times. Flexor dominance with extensor weakness—especially on the affected side—indicating altered neuromuscular control and the need for targeted sensorimotor rehabilitation.

Trial registration: The study was registered at ClinicalTrials.gov under Clinical Trials registration number NCT07134452 on 11/08/2025.

Keywords: Scapholunate instability, Proprioception, Weight bearing, Isokinetic muscle strength-balance, Reaction time, Function

A-0279 ACUTE HAND COMPARTMENT SYNDROME: FUNCTIONAL OUTCOMES AFTER EARLY DECOMPRESSION AND STRUCTURED REHABILITATION

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Introduction: Hand compartment syndrome is an uncommon but potentially devastating surgical emergency characterized by increased intracompartmental pressure leading to reduced tissue perfusion. Its incidence is low, representing less than 5% of all compartment syndromes, but functional consequences can be severe if diagnosis is delayed. Irreversible ischemic changes may occur within six hours, resulting in permanent neuromuscular damage. In contrast to lower limb presentations, diagnostic criteria for the hand remain poorly defined due to the complex compartmental anatomy and variability in clinical manifestations. The condition may develop following trauma, burns, crush injuries, infections, ischemia-reperfusion, or prolonged compression related to systemic illness or intoxication. The underlying pathophysiology involves an increase in interstitial pressure exceeding capillary perfusion pressure, producing a self-perpetuating cycle of ischemia, edema, and necrosis. Early recognition is essential, as diagnostic imaging or pressure measurements should not delay surgical decompression. Key clinical indicators include severe pain disproportionate to findings, pain on passive stretch, tense swelling, paresthesia, motor weakness, and reduced perfusion.

Aim: This case report presents the diagnostic and therapeutic management of acute hand compartment syndrome, emphasizing the importance of early surgical decompression and a structured rehabilitation program to optimize functional recovery and minimize long-term sequelae.

Material & Methods: We report the case of a 64-year-old previously healthy man admitted after an unwitnessed fall complicated by pulmonary sepsis. On examination, he exhibited significant swelling of the right hand, sensory deficits, paresthesia, and partial finger paresis. The diagnosis of hand compartment syndrome was made clinically and supported by ultrasonographic findings consistent with elevated compartmental pressure and reduced perfusion. Clinical assessment parameters included pain (Visual Analogue Scale, VAS), edema (Figure-of-Eight measurement), sensory testing (Semmes–Weinstein monofilaments), motor evaluation (range of motion and grip strength via Jamar dynamometer), and functional performance (DASH score). The patient underwent emergent decompressive fasciotomy involving all hand compartments, followed by staged wound closure and an intensive rehabilitation protocol focused on early mobilization, edema control, and sensory re-education.

Results: At three months postoperatively, the patient demonstrated marked improvement. Pain decreased from 3 to 0 on the VAS, swelling reduced from 54 to 47 cm, and partial sensory recovery was achieved. Grip strength improved from 0 to 10 kg compared to 30 kg on the contralateral hand, and range of motion increased significantly. The DASH score improved from 92 to 63, indicating substantial recovery of hand function. Progressive gains in strength and dexterity continued during subsequent follow-up.

Conclusion: Hand compartment syndrome remains a time-critical surgical emergency where early recognition and decompression within six hours are decisive for functional preservation. This case reinforces current evidence that prompt fasciotomy, combined with a structured and multidisciplinary rehabilitation program, yields the best neuromuscular recovery and functional outcomes. Awareness of subtle presentations and rapid clinical decision-making are essential to prevent irreversible damage and optimize patient prognosis.

A-0280 EVIDENCE-BASED MANAGEMENT OF SCAPHOLUNATE DORSAL GANGLIONS: A SYSTEMATIC REVIEW AND COMPARATIVE ANALYSIS OF CONSERVATIVE, OPEN, AND ARTHROSCOPIC APPROACHES

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Introduction: Scapholunate dorsal ganglions are the most frequent benign soft-tissue lesions of the dorsal wrist, representing 60–70% of all wrist ganglions. Although histologically benign, they can cause chronic pain, motion limitation, and aesthetic concerns, often leading to functional impairment in active individuals. Their pathogenesis remains multifactorial, involving joint capsular degeneration and repetitive microtrauma around the scapholunate interval. Despite numerous treatment options, ranging from conservative management to open or arthroscopic excision, consensus on the optimal strategy remains elusive. Reported recurrence and complication rates vary widely, reflecting heterogeneity in patient selection, surgical technique, and follow-up. An evidence-based synthesis is therefore needed to guide clinical decision-making and training in hand surgery.

Aim: To systematically evaluate and compare outcomes of conservative, open, and arthroscopic management for scapholunate dorsal ganglions, with emphasis on recurrence, patient satisfaction, complication profile, and functional recovery.

Material & Methods: A systematic review was performed according to PRISMA guidelines, searching PubMed, Embase, Scopus, and the Cochrane Library for studies published between January 2000 and December 2024. Eligible studies directly compared at least two treatment modalities among conservative therapy, open excision, and arthroscopic resection. Data extracted included recurrence rate, patient satisfaction, functional recovery, aesthetic result, and complications. Thirty studies fulfilled inclusion criteria, comprising 3 randomized controlled trials, 9 prospective cohort studies, 12 retrospective

analyses, and 6 systematic reviews. In total, more than 4,500 patients were evaluated, with mean follow-up ranging from 12 months to 5 years. Study quality and bias were assessed independently by two reviewers.

Results: Conservative management (observation, immobilization, or aspiration $\pm$ corticosteroids) was associated with highly variable recurrence rates (7–72%, mean 45%) and limited long-term satisfaction, making it suitable only for mildly symptomatic or low-demand patients. Open surgical excision achieved lower recurrence rates (6–41%) when the articular stalk was removed, but was associated with postoperative stiffness, scarring, and pain, with patient satisfaction between 65% and 75%. Arthroscopic resection consistently demonstrated the best overall outcomes, with recurrence rates between 0% and 16% (mean 7%), faster functional recovery, superior cosmetic results, and satisfaction exceeding 85%. Conclusions: Based on current evidence, arthroscopic resection provides the most favorable balance between low recurrence, rapid recovery, and high patient satisfaction, supporting its role as the preferred technique. Reported recurrence rates after arthroscopic excision range from 0% to 16% (mean 7%), with patient satisfaction consistently exceeding 85% and faster functional recovery compared to other approaches. Open excision demonstrates recurrence rates between 6% and 41%, with satisfaction levels around 70%, while conservative management shows recurrence rates averaging 45% and lower long-term satisfaction. These findings support early minimally invasive intervention when feasible, optimizing both functional and aesthetic outcomes for patients with symptomatic scapholunate dorsal ganglions.

A-0281 COMPARATIVE STUDY: HEMATOMA BLOCK AND HEMATOMA BLOCK PLUS INTEROSSEOUS NERVE BLOCK FOR DISTAL RADIUS FRACTURES CLOSED REDUCTION

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Introduction: Distal radius fractures (DRF) are among the most frequent acute injuries in Orthopedics Emergency Department (OED). If displaced, they need reduction. During closed reduction, pain usually prevents patients from collaborating appropriately. In our experience, even after hematoma block (HB), patients still report pain during the reduction. The interosseous nerves terminal branches (APIN) innervate the distal radioulnar joint, the wrist capsule, the carpal bones and the intrinsic ligaments. The addition of the APIN block can be option to lower the pain during and after the reduction maneuver.

Aim: To evaluate the addition of the interosseous nerve block in the reduction of pain during the reduction of distal radius fractures.

Material & Methods: This is a IRB approved consecutive case series study of acute DRF handled in the OED of our hospital. Pain during and after the reduction maneuver was evaluated by the Visual Analogue Scale (VAS). We used lidocaine at 2% as a local anesthetic and performed a hematoma block (HB) with 10 mL 2% lidocaine or HB plus APIN block (HBIN) with 15mL 2% lidocaine, in an alternate series.

Results: We included 52 cases with mean age of 60 years. 24 patients with HB and 28 with HBIN. Mean VAS score during the reduction maneuver in group HB was 3.8 (SD 2.1; range 0 to 8); mean VAS score in HBIN group was 1.6 (SD 1.3; range 0 to 5). Conclusions: Adding APIN block to HB proved more effective than HB alone in reduction of pain during the reduction and can be a good tool when dealing with DRF in the OED. Larger randomized trials are recommended to confirm these results.

A-0282 LOSS OF VOLAR HOOK IN DISTAL RADIUS FRACTURES – IS NON-SURGICAL TREATMENT A PLAN TO FAIL?

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Introduction: The importance of lost “volar hook” – an ad latus dislocation of the volar cortex on the lateral x-ray- view – for the possibility of maintaining an acceptable position with non-surgical treatment of distal radius fractures has attracted some attention in the recent years, as it may be used for forecasting re-displacement in reduced fractures that are non-surgically treated.

Aim: To assess the importance of primary loss of volar hook for the possibility to maintain an acceptable position with non-surgical treatment of distal radius fractures in adults.

Material & Methods: In a retrospective cohort-study with 1761 distal radius fractures from four Swedish hospitals between 2019 and 2023, we included 621 fractures with loss of volar hook on initial X-rays after trauma. X-rays were also obtained after reduction and after approximately 10 days if non-surgically treated. Outcome measures were incidence and the proportion that, after reduction and at X-ray control after 10 days, still was within the limits for non-surgical treatment according to the Swedish national guidelines. These fractures were compared with 432 reduced fractures without primary loss of volar hook.

Patients with functional demands so low that surgical treatment shouldn't be considered regardless of fracture displacement were excluded.

Results: 35% of all 1761 fractures had primary loss of volar hook, and among the 975 fractures that underwent closed reduction the proportion was 57%. Only 17% of fractures with loss of volar hook reached an acceptable position after reduction, compared with 57% in the control group.

Fractures with loss of volar hook that were treated with closed reduction and splinting only, had a low possibility to retain an acceptable position over time. At the x-ray control after 10 days in patients treated non-surgically, an acceptable position was retained in:

3% of fractures with remaining loss of volar hook after reduction.

24% of fractures where the volar cortex was properly reduced.

43% of fractures without primary loss of volar hook.

Conclusions: Loss of volar hook is a significantly negative predictor for successful non-surgical treatment of distal radius fractures, especially if the volar cortex can't be reduced properly. This should be a factor to include in the decision-making for the need of surgical treatment.

A-0283 CLINICAL RESULTS OF AO TYPE C3 DISTAL RADIUS FRACTURES WITH THE VOLAR LUNATE FACET FRAGMENT

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Introduction: Recent reports suggest it is difficult to achieve reduction and fixation with volar lunate facet (VLF) fragments for surgical treatment of distal radius fractures (DRFs) with volar locking plate (VLP).

Aim: The purpose of this study is to examine treatment outcomes of DRFs with VLF fragments.

Material & Methods: One hundred three patients who underwent open reduction and internal fixation for an DRF (AO classification type C3) were included and classified into one of the following two groups: VLF (+) or VLF (-). There were 56 patients in the VLF (+) group and 47 patients in the VLF (-) group.

Results: On clinical evaluation at final follow-up, the mean Mayo Performance Score (MPS) was 87.8 in the VLF (+) group, and 91.8 in the VLF (-) group ($P=0.022$). No significant difference was noted on the mean range of motion between the groups. The mean grip strength was significantly smaller in the VLF (+) group than VLF (-) group. On radiography, 21 patients (21.4%) had a reduction loss of >1 mm in ulnar variance from immediately postoperatively to final follow-up in the VLF (+) group, while three patients (6.4%) had a reduction loss in the VLF (-) group.

Conclusions: Treatment of DRFs with VLF using an existing volar locking plate is difficult due to its anatomical characteristics. Distal and ulnar placed VLP applicable to DRFs distal to the watershed line have recently been developed, and treatment of DRF with VLF has improved. By stabilizing fragments, distally placed VLP fixation effectively treated DRFs with VLF fragments. However, the presence of small displaced VLF fragments may increase the risk of reduction loss in ulnar variance.

A-0284 CHRONIC NOCIPLASTIC PAIN IN HAND THERAPY

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Introduction: A lot of patients in hand therapy have chronic pain.

Aim: Can we determine which patients are at the highest risk of having chronic nociplastic pain?

Material & Methods: We evaluated 21 patients :

- history
- central sensitization inventory
- mc gill pain questionnaire
- Nijs algorithm

Results: 33 % of patients have chronic nociplastic pain including

71 % are women

43 % have thyroid problems

86 % are overweight or obese

100% have allodynia

57% have red flags

have a average score of 71 on quickdash

have a average score of 49 on the CSI

Conclusions: Nociplastic chronic pain affects about one-third of patients in hand therapy and seems to affect some patients more than others.

A-0285 TRIPLE NERVE TRANSFER VIA A FULLY POSTERIOR APPROACH AFTER TRAUMATIC BRACHIAL PLEXUS C5-C6 INJURIES

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Introduction: Following C5-C6 injuries, there is loss of function in the nerves responsible for the top-priority functions such as elbow flexion, shoulder external rotation, stability, and abduction. The reinnervation of the suprascapular nerve (SSN), axillary nerve (AN), and musculocutaneous nerve (MCN), either via repair, nerve transfers, or a combination of these, is essential in treatment. The most commonly used and recommended nerve transfers for this type of injury are the triple nerve transfer operation, which includes spinal accessory nerve (SAN)-SSN, radial nerve medial triceps branch (MTB)-AN, and transfer of a motor branch from the ulnar and median nerves to the biceps and brachialis branches (Oberlin variations, hereinafter referred to as Oberlin). Technical variations of the triple nerve transfer involve anterior or posterior approaches. SAN-SSN and MTB-AN nerve transfers have been described via both approaches, but, to our knowledge, the Oberlin transfer has only been described with a medial approach in the supine position. In our case series, the aim is to show that all three transfers including the Oberlin transfer can be performed via a posterior approach in the prone position. **Material & Methods:** Indications for the fully posterior triple nerve transfer were limited to cases where plexus exploration would not be performed. Cases with definite root avulsions, previously explored dense scar tissue, or late-stage cases were included as indications. (For cases requiring plexus exploration, the transfers were performed via an anterior approach.) Functionality of the C7-8-T1 roots was required as a criterion.

The surgical technique was performed according to descriptions in the literature for SAN-SSN and MTB-AN transfers. In the Oberlin transfer, which differed, the incision was made slightly posterior to the classic description, with the patient in the prone position, shoulder in slight abduction, arm in maximum internal rotation, and elbow in mild flexion (figures 1-2-3-4-5). During nerve coaptations, it was ensured that there was no tension in the repair lines when the elbow was flexed, taking into consideration that the elbow was in mild flexion during the procedure.

Results: The nerve transfers were performed in five cases. Since the fifth case was only one-month post-operation, no results were yet observed. In the other four cases, varying degrees of shoulder abduction and external rotation, as well as elbow flexion, were achieved (figure 6).

Conclusions: Although the number of cases is low due to the narrow indication group and thus the level of evidence is limited, our study and observations demonstrate the feasibility of the Oberlin transfer via a posterior approach in the prone position. In the techniques described in the literature, for posterior nerve transfer, the first two transfers are performed with the patient prone, and then the patient needs to be switched to supine during surgery. In our technique, all three transfers could be performed in the same position without intraoperative repositioning. Results of the Oberlin transfer in prone position are similar with our standard transfers with supine position.

A-0286 RELIABILITY OF GRIP STRENGTH MEASURES IN YOUNG CHILDREN: A SYSTEMATIC REVIEW

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Introduction: Grip strength is an important measure of hand function and overall muscular strength, serving as a key indicator for motor skills, health, and developmental progress in both clinical and research settings. Given the diverse

range of physical and cognitive developmental stages between infancy and adolescence, accurate and reliable tools are essential for assessing maximal grip strength performance across the developmental spectrum. Multiple grip strength assessment tools have been developed and validated for adult populations; however, translating these tools to pediatric populations presents unique challenges given children's smaller hand size, shorter attention spans, ability to follow commands, and evolving motor skills.

Aim: This study evaluated which tools have the highest quality evidence for best measuring pediatric hand strength. We identified the range of devices and their respective features, focusing on whether a commercially available product currently exists that can reliably assess hand strength in children and how much supporting research justifies clinical use.

Material & Methods: PubMed, Embase, Cochrane Library, CINAHL, and Google Scholar databases were systematically searched to identify relevant studies. Primary peer-reviewed studies assessing grip or pinch strength in children under the mean age of 12 were included if they reported on reliability, validity, feasibility, and/or responsiveness. Studies focusing on adults, review articles, and conference abstracts were excluded. Titles and abstracts were screened in duplicate using Covidence, with discrepancies resolved by consensus. Data was extracted by a single reviewer, with quality checking by a second, and then synthesized to identify patterns. Risk of bias evaluations using the COSMIN criteria are in process to evaluate the quality of papers describing psychometric properties.

Results: A total of 894 articles were identified through database searches after de-duplication. After title and abstract screening, 135 articles proceeded to full-text review, with 52 papers included for data extraction. Papers were published between 1986 and 2025, representing 24 different countries: Belgium published the most papers on this topic ($n=7$). Sample sizes ranged from 9–3804, with the largest samples representing fitness testing in healthy volunteers. Only one paper addressed children with congenital hand conditions and none addressed traumatic hand injuries in children. Both analog and digital dynamometers were well represented; several older papers also addressed inflated bulb gauges. Several papers reported grip strength could be used as an efficient surrogate measure for health and nutrition screening in pediatric populations. Importantly, no papers clearly compared whether very young children (ages 3–5) could produce maximum grip effort with the same reliability as those ages 6+.

Key findings were all studies reported tools to have good reliability with 3 trials in a stable interval for both inter and intra-rater reliability. No studies reported responsiveness to change, and smallest detectable changes across tools were in excess of 2kg.

Conclusions: The validation of grip strength tools for pediatric use is essential. Persistent gaps include a lack of validation in clinical populations, floor effects when adult devices are used, and a lack of visual feedback as a potential contribution to substantive levels of measurement error.

A-0287 SHEAR WAVE ELASTOGRAPHY OF THE MUSCLES AND FASCIAE OF THE ANTERIOR COMPARTMENT OF THE FOREARM: TOWARD CLINICAL APPLICATIONS IN FASCIAL AND COMPARTMENT DISORDERS

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Introduction: Although Shear Wave Elastography (SWE) is increasingly used in musculoskeletal imaging, its application to fascial tissue remains limited. Fascia and muscle stiffness may play a key role in several clinical conditions such as chronic exertional compartment syndrome, fascial adhesions, and overuse-related pain syndromes.

Aim: We hypothesized that the mechanical properties of the forearm's anterior fascia and muscles vary with wrist and finger positions and muscle contraction. This study aimed to characterize their distinct mechanical responses and to establish reference SWE values under different loading conditions.

Material & Methods: Thirty healthy volunteers underwent SWE of the forearm muscles and fascia in rest, wrist and finger extension, flexion, and grip tasks (2–4 kg). The effects of age, sex, and limb dominance were analyzed.

Results: Age significantly increased fascial stiffness, while sex and dominance had no effect. Fascial stiffness increased by approximately one-third when moving from the resting position to flexion and extension, and it doubled during grip tasks, with only modest increments between each load levels. Muscle stiffness showed a progressive load-dependent increase and a moderate correlation between fascial and muscular stiffness was observed in non-loaded conditions.

Conclusions: This study highlights distinct biomechanical behaviors between fascia and muscle in the forearm. The identification of reference SWE values provides a foundation for assessing abnormal fascial stiffness in clinical settings, particularly in compartment syndromes and other fascia-related disorders. Further studies should validate these findings and explore their diagnostic and therapeutic implications.

A-0288 CORONOID PROCESS FRACTURES – SURGICAL STRATEGIES AND SOLUTIONS

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Introduction: The coronoid process is an important stabilizer of the elbow joint. Fractures of the coronoid process are part of various elbow instability patterns and are associated with specific injury mechanisms. In the context of complex fracture–dislocations of the elbow joint, their management presents a major challenge. Untreated or insufficiently stabilized coronoid process fractures can lead to severe complications.

Aim: This retrospective study presents surgical treatment options for coronoid process fractures based on selected case examples.

Material & Methods: Accurate assessment of the fracture pattern and recognition of the injury mechanism are crucial for the management of coronoid process fractures. Associated fractures are evaluated using X-ray and CT imaging, and the injury mechanism also provides insights into potential ligamentous damage. Depending on the pathoanatomy, fixation of the coronoid process can be achieved using plates, screws, the lasso technique, or a modified lasso technique. Precontoured plates are not always applicable. Surgical exposure was performed either through an isolated lateral approach or a combined lateral and medial approach. A stable fixation of the coronoid process and appropriate treatment of concomitant injuries are essential for achieving a good functional outcome.

Results: In all cases presented, a functional postoperative rehabilitation protocol was applied. Using the treatment regimen described here, good functional outcomes were achieved in all patients, despite varying pathoanatomy and injury patterns.

Conclusions: The management of coronoid process fractures often presents significant challenges. Assessment of the pathoanatomy and identification of the injury mechanism are key aspects for adequate treatment of these injuries. Stable fixation of the coronoid fractures and their associated injuries is crucial for achieving a good functional outcome. This approach also helps prevent severe complications of the elbow joint, such as arthrosis and restriction of motion.

A-0289 DISPLACED FRACTURE OF THE TROCHLEA HUMERI IN THE CONTEXT OF A COMPLEX ELBOW DISLOCATION IN A 13-YEAR-OLD – CASE PRESENTATION

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Introduction: Complex elbow dislocations involving both bony and ligamentous injuries are rare in children and adolescents. Elbow dislocations associated with a trochlear fracture and rupture of the lateral collateral ligament have been described only in isolated cases in the literature. The optimal management of such combined injuries remains a challenge and is crucial for achieving a good functional outcome.

Aim: How can early reduction, detailed imaging, and anatomical reconstruction lead to excellent functional outcomes in complex pediatric elbow dislocations involving the trochlea? **Material & Methods:** We report the case of a 13-year-old boy who sustained a complex elbow dislocation with a trochlear fracture and rupture of the lateral collateral ligament due to a varus mechanism during judo practice. Initial management included closed reduction in the emergency room, followed by CT and MRI imaging for detailed assessment of the osseous and ligamentous injuries. Surgical treatment was performed using combined medial and lateral approaches. Medially, the trochlear fracture and an associated ulnar epicondyle fracture were openly reduced and fixed with screws. Laterally, the ruptured lateral collateral ligament was repaired. Postoperatively, the arm was immobilized in a functional elbow brace for six weeks, followed by an intensive physiotherapy-based rehabilitation program.

Results: The postoperative course was uneventful. Seven months after surgery, the osteosynthesis material was removed. The patient regained nearly full, pain-free range of motion in the elbow joint, showed no signs of instability, and has since returned to full sports participation, including active judo training.

Conclusions: This case demonstrates that even in complex elbow injuries during growth, excellent functional outcomes can be achieved through early reduction, comprehensive imaging, and anatomical reconstruction of both bony and ligamentous structures. The case highlights the importance of adequate management of all injured components and provides valuable insights for the diagnosis and treatment of similar injuries in clinical practice

A-0290 WHEN PALMAR FASCIA FIGHTS BACK: TISSUE TENSION, FASCIAL BALANCE, AND TREATMENT RESULTS IN DUPUYTREN'S DISEASE

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Introduction: Dupuytren's disease is a fibroproliferative disorder of the palmar fascia leading to progressive finger flexion contractures, primarily affecting the ring and little fingers. Beyond genetic and cellular factors, biomechanical forces, tissue tension and fascial imbalance, play a central role in sustaining myofibroblast activity, collagen remodeling, and contracture progression. The disease typically follows a sequence: nodule formation, cord development (central, spiral, pretendinous), and joint contracture, with certain bands (spiral, pretendinous) associated with higher recurrence and risk of neurovascular involvement. Understanding the interplay between tissue mechanics, anatomical progression, and treatment response is crucial for optimizing functional and aesthetic outcomes.

Aim: To review and synthesize current evidence on the biomechanical mechanisms of Dupuytren's disease and compare outcomes of the main treatment modalities: partial fasciectomy, minimally invasive procedures (percutaneous fasciotomy or collagenase injection), and conservative management; focusing on recurrence, functional recovery, and patient satisfaction.

Material & Methods: A narrative review was performed using PubMed, Scopus, and Web of Science, including studies published between 2000 and 2024. Keywords included “Dupuytren’s disease,” “biomechanics,” “fasciotomy,” “fasciectomy,” “collagenase,” and “recurrence.” Studies reporting clinical, functional, and recurrence outcomes for partial fasciectomy, minimally invasive procedures, or conservative therapy were included. Data from over 40 publications, including clinical trials, cohort studies, and biomechanical analyses, were synthesized.

Results: Partial fasciectomy: Recurrence rates 20–50% at 5 years, higher in spiral and pretendinous cords; patient satisfaction 70–85%; provides durable correction and reduces fascial tension locally.

Minimally invasive procedures (percutaneous fasciotomy/collagenase): Recurrence 30–60% at 3–5 years, faster recovery, high early satisfaction (>85%), but higher recurrence in severe or multi-band disease.

Conservative management: Observation, splinting, or injection alone; recurrence 45–70%, limited functional improvement, satisfaction <60%.

Biomechanical analyses confirm that sustained tissue tension and fascial imbalance drive disease progression. Surgical or minimally invasive interventions reduce local tension, but residual fascial imbalance may explain persistent recurrence. Studies also highlight the importance of early intervention, cord-specific release, and attention to neurovascular anatomy to optimize outcomes.

Conclusions: Dupuytren’s disease reflects both a fibroproliferative disorder and a dynamic biomechanical imbalance within the palmar fascia. Partial fasciectomy offers the most durable correction with moderate recurrence, particularly effective for high-risk cords (spiral, pretendinous) and fingers commonly affected (ring and little fingers). Minimally invasive procedures provide faster recovery and high early satisfaction but show higher recurrence in severe or multi-band disease. Conservative management is limited to asymptomatic or low-demand patients due to higher recurrence and limited functional improvement. Recurrence is influenced by cord type, digit involved, and residual fascial tension. Integrating biomechanical principles, tension-neutral incisions, selective cord release, and early controlled mobilization, can optimize functional and aesthetic outcomes. Overall, considering recurrence, functional restoration, and long-term stability, partial fasciectomy remains the preferred treatment for patients requiring durable correction, while minimally invasive approaches are suitable when rapid recovery and minimal invasiveness are prioritized. Understanding these interactions is essential for evidence-based decision-making, tailored treatment, and improving long-term prognosis.

A-0291 BALANCING ACT: LIGAMENTOUS AND DYNAMIC STABILITY IN DISTAL RADIOULNAR JOINT RECONSTRUCTION

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Introduction: The distal radioulnar joint (DRUJ) depends on a precise interplay between bony anatomy, ligamentous structures—particularly the triangular fibrocartilage complex (TFCC) and the distal interosseous membrane (IOM)—and dynamic muscular stabilizers such as the pronator quadratus. Trauma, degenerative disease, or chronic instability can disrupt this balance, leading to pain, limited pronation-supination, and forearm dysfunction. Cadaveric and clinical studies indicate that addressing only static ligamentous structures may leave residual instability, particularly under rotational loads.

Aim: To review current evidence on biomechanical contributors to DRUJ stability—ligamentous and dynamic—and to synthesize surgical strategies that restore this equilibrium, focusing on functional outcomes, rotational congruency, and planning considerations in hand surgery.

Material & Methods: A narrative review was conducted using PubMed, Scopus, and Web of Science for publications between 2010 and 2025. Search terms included “DRUJ instability,” “TFCC repair,” “distal interosseous membrane,”

“forearm biomechanics,” and “ligament reconstruction.” Both cadaveric and clinical outcome studies were included, focusing on anatomical restoration, functional results, and recurrence of instability. Key studies included systematic cadaveric reviews of TFCC repairs, clinical series reporting grip strength and rotational range post-reconstruction, and biomechanical analyses of double-button constructs for DRUJ stabilization.

Results: The TFCC and distal IOM act synergistically to maintain DRUJ congruency and rotational stability. Foveal TFCC reinsertion reduces dorsal translation from 2.48 mm to ~0.70 mm in cadaveric models. Arthroscopic transosseous repairs in clinical series report DRUJ stability in 76–80% of patients at mid-term follow-up, with significant improvements in grip strength (~90–95% of contralateral hand) and pronation-supination range (~85–90°). Double-button constructs and tendon grafts enhance rotational stability, particularly in cases of chronic instability or multi-band lesions. Open TFCC repairs achieve similar functional outcomes but may be associated with extensor carpi ulnaris tendinitis or neuroma formation in 5–10% of cases.

Conclusions: Restoring both ligamentous architecture and dynamic muscular/fascial balance is essential for durable DRUJ stability and coordinated forearm rotation. Surgical planning should incorporate assessment of TFCC integrity, IOM contribution, and pronator quadratus function, aiming for tension-neutral reconstructions that restore both static and dynamic stabilizers. Techniques such as foveal reinsertion, tendon graft augmentation, or double-button constructs have demonstrated reliable biomechanical and clinical outcomes, improving grip strength, rotational range, and patient-reported stability. Integrating biomechanical principles into preoperative planning enables precise surgical targeting, reduces residual instability, and optimizes functional recovery.

A-0292 ARE GRIP STRENGTH MEASURES RELIABLE IN VERY YOUNG CHILDREN? A PSYCHOMETRIC STUDY

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Introduction: Grip strength is a simple tool for screening and monitoring physical health in children. However, no studies report reliability of grip strength measures in children with traumatic injuries or congenital differences, and there is no normative data for under age 6. Reasons for these gaps include the poor fit between early development and the use of adult tools rather than tools developed specifically for children. Based on recent work with the Squegg (TM) grip device and our own work developing a pediatric grip device (prototyped as a dinosaur toy), we tested grip strength in very young children.

Aim: To estimate the test-retest reliability and validity of the Squegg and ‘Dinometer’ in typically developing children.

Material & Methods: Working with a daycare, we obtained parent consent to test children using Squegg and the ‘Dinometer’. The Dinometer lights up and makes sound when squeezed; it is instrumented to test both grip and pinch strength. Children were tested on both hands seated in a child-size chair for stability. They were asked to squeeze as hard as they could three times with each device: device order was randomized, and ICC values for consistency and absolute reliability calculated. We measured circumferential hand size in cm at the distal palmar crease. To test convergent validity with regression modelling, we hypothesized grip strength would increase with age and hand size, but that sex and observed hand preference would not influence grip at this developmental stage.

Results: We tested 134 children ages 24 months to 63 months (mean 43.0), with n=128 and 102 completing repeated measures on at least one hand with the Dinometer and Squegg respectively. ICC for absolute agreement of any individual grip measure was 0.87 [.84, .89] for the Dinometer and 0.57 [.49, .64] for Squegg; this increased to 0.95 [.94, .96] and

0.80 [.74, .84], respectively, for the average measures. Consistency for pinch strength measured using the Dinomometer was good for individual (ICC=0.08 [.75, .83]) and excellent at 0.92 [.90, .94] for average measures. Regression modelling of Squegg grip measures confirmed our hypothesis that age and hand size were significant predictors ($p<0.001$) but only accounted for a small proportion of variance ($R^2=0.17$). For the Dinomometer, these variables were also significant but explained more variance ($R^2=0.43$ for grip; $R^2=0.42$ for pinch).

Conclusions: This study suggests very young children can consistently demonstrate grip and pinch strength. Squegg is a commercially available device; these results support reliable use when grip is measured as an average of 3 trials, but not as a single effort. The Dinomometer shows promise as a robust way of measuring grip and pinch: this study provides preliminary evidence of good reliability for single trials and excellent for repeated measures. The higher number of children willing to be tested with the Dinomometer reflects the engagement of a child-tailored device. Work is ongoing to refine into a final form to optimize portability, with plans to test in children with brachial plexus birth injuries, congenital differences and traumatic injuries.

A-0293 POSTOPERATIVE INFECTION FOLLOWING OPEN HAND INJURIES WITH STRUCTURAL INVOLVEMENT

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Introduction: Postoperative infection remains a significant concern in the management of open hand injuries. Current clinical practice frequently involves irrigation and primary closure in the Emergency Department (ED), with subsequent definitive management performed in the operating theatre. This study assessed infection rates in open hand injuries with underlying structural damage that did not undergo wound closure in the ED, and to determine whether this was associated with a higher rate of postoperative infection.

Methods: This was a single center retrospective study at a UK Major Trauma Centre between 2022 and 2024. Theatre management software was used to identify all patients who underwent surgery for open hand lacerations during the study period. All patients 18 years and over with an open wound to the hand or wrist with associated injury to flexor or extensor tendons, digital vessels, nerves, joint capsule, or ligaments were included. Those with open fractures requiring internal fixation, pre-existing wound infection, delayed presentation (>7 days post-injury) and an involvement proximal to zone 6 dorsal and zone 5 volar were excluded. ED documentation and clinical photographs were reviewed to confirm that the wound was either un-sutured or had minimal “tack” sutures at presentation. Infection was defined as any presentation requiring antibiotic therapy within six weeks post-injury, regardless of surgical washout or positive microbiological cultures.

Results: A total 278 patients met the inclusion. The average age was 37.5 (SD15.8), 80 (28.8%) female, and the rest were male. 159 patients (57.2%) completed at least six weeks of hospital follow-up (mean 57.1 ± 19.4 days). The remaining patients had shorter hospital follow-up (mean 19.3 ± 10.2 days) before transition to primary care (79 patients, 28.4%) or exclusive follow-up in primary care (40 patients, 14.4%). Mean time to surgery was 41.5 hours ± 28.5 . Postoperative infection occurred in six patients (2.2%). Infections included one stitch abscess, four superficial infections treated with oral antibiotics, and one deep infection requiring surgical washout

Conclusion: The overall infection rate in this study was 2.2%, which lies within the literature reported range for open hand injuries (1–5%). The presence of underlying soft tissue injury did not appear to increase infection risk. Primary wound closure of complex hand injuries in the ED is often time-consuming and uncomfortable for the patient. This study supports the safety of irrigation and dressing in cases where definitive exploration and repair are scheduled within a few days. This approach avoids unnecessary delay in patient discharge from the ED without increasing the risk of infection.

A-0294 LIGAMENT RECONSTRUCTION INTERPOSITION ARTHROPLASTY MODUM WEILBY VERSUS SIMPLE TRAPEZIECTOMY FOR PRIMARY THUMB CARPOMETACARPAL OSTEOARTHRITIS: A DOUBLE-BLINDED, RANDOMIZED CLINICAL TRIAL

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Introduction: Simple trapeziectomy or trapeziectomy with ligament reconstruction tendon interposition are both accepted procedures in treatment of trapeziometacarpal arthritis in thumb but there is lack of sufficient comparative studies on which surgical technique to choose.

Aim: There has been a call for more high-quality studies to compare trapeziectomy with ligament reconstruction tendon interposition to simple trapeziectomy.

Material & Methods: 60 patients with primary thumb TM arthritis were randomised to either Weilby ligament reconstruction tendon interposition arthroplasty or simple trapeziectomy. In the trapeziectomy group a sham incision was performed to mimic the same surgical approach.

Results: The QDASH score at 3, 6 and 12 months of follow-up was lower in Weilby group, VAS score favoured Weilby group, at 6 and 12 months, results for grip and pinch strength favoured Weilby group at 3, 6 and 12 months post operatively. ROM results favoured Weilby group at 12 months, though all results were not statistically significant.

Conclusions: There was no significant difference between the groups at 3, 6 or 12 months follow up.

A trend was noticed towards better results in the Weilby group.

A-0295 OPTIMISING THE MANAGEMENT OF ACUTE TRAUMATIC Mallet FINGER INJURIES: A CLINICAL AUDIT OF COMPLIANCE WITH BSSH GUIDELINES

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Introduction: Mallet finger is a common traumatic injury involving disruption of the extensor tendon at the distal interphalangeal joint. Although national guidance is available, practice can still vary between clinicians and settings. The 2021 BSSH guidelines set out clear standards for early referral, appropriate splinting duration, and patient education.

Aim: This audit reviewed how closely our current practice follows the BSSH standards in acute mallet injury management, outcomes and ways to improve consistency and patient care within our hand unit.

Material & Methods: We carried out a retrospective audit of adult patients (>16 years) presenting with acute mallet injuries (<12 days old) managed non-operatively. Chronic or surgically treated cases were excluded. Data collected included time to referral, documented and actual splint duration, provision of written information, and extensor lag at discharge. Team awareness of the BSSH guidelines was assessed through a short questionnaire.

Results: Twenty-six patients were included. Median time from assessment to referral was 3 days (IQR 2-4). with 66.7% seen within 72 hours. Documentation of splint duration was incomplete in 50% of cases; however, when recorded, adherence to guidelines recommendations was 50% in bony and 72% in soft-tissue injuries. Actual splint duration compliance was favourable with 94% adherence in soft and 100% in bony injuries. 92% of patients received written information. Functional

outcomes were slightly behind published literature, with a median extensor lag of 10° (IQR 0-15). compared to published median 3°-12°. The mean staff knowledge score regarding guideline criteria was 60.9%.

Conclusions: This audit revealed slightly sub-optimal outcomes despite high compliance rate to actual splinting time and patient education through leaflets, which can be attributed to actual patient compliance and understanding of the information. It also identified information gap, inconsistencies in documentation and splinting compliance. As a result, a structured Mallet Management Pathway has been introduced and displayed in clinics, team education was improved, and QR-linked patient education video was incorporated in the information leaflets to enhance compliance.

These measures have streamlined management, increased awareness of national standards, and promoted consistent, guideline-based care for patients with acute mallet finger injuries.

A-0296 STRUCTURED PROBLEM-BASED LEARNING IN HAND SURGERY EDUCATION: QUANTIFYING COGNITIVE OUTCOMES THROUGH STANDARDIZED ASSESSMENT

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Introduction: The structure and assessment of hand surgery education continue to vary throughout Europe. Even though FESSH encourages harmonization, exposure-based or opportunistic learning is still used in many residency programs. Although there is still a lack of objective data in hand surgery education, structured and competency-driven frameworks, particularly problem-based learning (PBL), can improve clinical reasoning and knowledge retention.

In this study, an orthopedic residency program's structured, PBL-focused hand surgery module is implemented, and its quantifiable educational impact is assessed. The model seeks to create an educational reflection of balance in hand function by achieving a balanced integration of theoretical knowledge and practical decision-making.

Aim: To compare residents' results on a standardized national exam before and after the implementation of a structured, interactive, and PBL-based hand surgery education model in order to evaluate the cognitive impact of the latter.

Material & Methods: A tertiary orthopedic residency program implemented a one-year structured hand surgery module. The module used a PBL framework with a focus on self-directed study, clinical reasoning, and active learning. A clinical scenario involving hand trauma, tendon or nerve repair, or reconstruction was the focus of each weekly one-hour session. In each session, twelve residents reviewed relevant literature, identified learning objectives, and participated in critical discussion of three peer-reviewed articles. Anatomical review, surgical decision-making, and evidence-based principles were all incorporated into each discussion under faculty supervision.

The Turkish National Residency Training Examination was used to assess educational outcomes both before and after the module in 2024 and 2025. Subspecialty classification was used for the exam items. The mean numbers of correct, incorrect, and blank responses were compared using paired t-tests; a p-value of less than 0.05 was deemed significant.

Results: All twelve participants successfully completed both evaluations. The average number of correct answers in the hand surgery domain rose from 6.0 ± 2.8 to 9.9 ± 2.3 , representing a 65% enhancement ($p = 0.0019$). The frequency of incorrect and blank responses diminished correspondingly.

Notable enhancements were recorded in pediatric orthopedics ($p = 0.026$), foot and ankle surgery ($p = 0.003$), and sports surgery ($p = 0.039$), whereas trauma and oncology exhibited no significant alterations ($p > 0.05$). The findings suggest that structured PBL enhances specialty-specific knowledge and facilitates cognitive transfer across related domains.

Conclusions: A structured, problem-based learning model in hand surgery education produced significant, measurable cognitive improvement while fostering balance between theoretical understanding and practical clinical reasoning.

This educational balance reflects FESSH's mission to advance both excellence in hand function and harmony in training standards across Europe. The model provides a reproducible framework that may guide future curriculum design toward equilibrium between knowledge acquisition, decision-making, and surgical application.

A-0297 MANAGEMENT STRATEGIES FOR IATROGENIC BRACHIAL PLEXUS AND AXILLARY NERVE INJURIES AFTER ARTHROSCOPIC SHOULDER SURGERY: A THREE-CASE SERIES

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Introduction: Iatrogenic nerve injuries following arthroscopic shoulder surgery are rare but may lead to significant functional impairment. Appropriate management requires a thorough understanding of the anatomical complexity and individualized reconstructive planning. We present three cases of iatrogenic nerve injury after arthroscopic shoulder surgery that were successfully managed with different surgical strategies.

Aim: To demonstrate the effectiveness of tailored surgical approaches—neurolysis, nerve transfer, and combined nerve and tendon transfer—for iatrogenic brachial plexus or axillary nerve injuries after arthroscopic shoulder procedures.

Material and Methods: Case 1: A 26-year-old male developed axillary nerve palsy after arthroscopic Bankart repair combined with the Bristow procedure. Neurolysis of the axillary nerve was performed under intraoperative monitoring using brain-evoked muscle potentials (Br(E)-MSEP).

Case 2: A 30-year-old male presented with axillary nerve paralysis after repeated arthroscopic Bankart and coracoid transfer surgeries. A nerve transfer from the radial nerve branch to the long head of the triceps to the anterior branch of the axillary nerve was performed through a posterior approach.

Case 3: A 40-year-old female developed incomplete brachial plexus palsy following arthroscopic shoulder stabilization. Because of insufficient recovery in the radial nerve territory, a thoracodorsal nerve to triceps branch of the radial nerve transfer was performed, followed three months later by a triceps tendon transfer (Tsuge method).

Results: In Case 1, neurolysis immediately restored muscle-evoked potentials, and deltoid strength recovered to nearly normal within one year.

In Case 2, reinnervation of the posterior deltoid was confirmed two months postoperatively, and active abduction improved from 30° to 70° at eight months.

In Case 3, reinnervation of the triceps was observed six months after nerve transfer, and elbow extension strength improved to MMT grade 3 after tendon transfer, enabling functional use of the affected upper limb. All patients achieved significant improvement in motor function and daily activity performance without major complications.

Conclusion: Iatrogenic brachial plexus or axillary nerve injuries after arthroscopic shoulder surgery require case-specific management. Neurolysis under intraoperative electrophysiological monitoring is valuable even in delayed cases, while nerve transfer using the radial or thoracodorsal nerve provides reliable reinnervation for axillary or triceps palsy. When both nerve and muscle degeneration are present, a combined nerve and tendon transfer offers an effective reconstructive option. A stepwise, function-oriented surgical approach can optimize outcomes in these challenging cases.

A-0298 RADIATION THERAPY FOR EARLY-STAGE DUPUYTREN'S DISEASE: SOUTHERN ARIZONA COHORT

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Introduction: Dupuytren's disease (DD) is a benign, progressive fibroproliferative disorder that disrupts the balance between collagen deposition and degradation within the palmar fascia, resulting in nodules, cords, and flexion contractures that compromise hand function. While surgical and enzymatic options—such as limited fasciectomy, needle aponeurotomy, and collagenase injections—exist, early-stage non-invasive interventions like radiation therapy (RT) may help restore biological and functional balance by slowing or halting fibroblast overactivity. Previous European studies have demonstrated reduced progression after RT.

Aim: To evaluate whether RT can limit fibroproliferative progression and preserve hand motion in the short term.

Material & Methods: A retrospective analysis was performed on 61 patients (85 hands) treated with RT for DD at our institution between 2015 and 2025. Demographic and clinical data were collected in REDCap, including pretreatment disease characteristics and post-treatment progression status. RT fields encompassed clinically defined areas of nodularity or cords. En face electron therapy (6–12 MeV) with custom bolus delivered 30 Gy in 10 fractions in most cases. Progression was defined by increased contracture or nodularity at follow-up. Analyses were performed per extremity using descriptive statistics and univariate logistic regression in SPSS to identify predictors of progression.

Results: Of the 61 patients (85 hands) analyzed, the median age was 66 years, 60.7% were male, and 77.0% were Caucasian. The pre-RT Tubiana stage distribution was 51.8% Stage N, 23.5% Stage N/I, 21.2% Stage I, 1.2% Stage II, and 2.3% Stage III. RT dose was 30 Gy/10 fractions in 95.3% of hands and 21 Gy/7 fractions in 2.4% of hands. The median initial follow-up was 5.5 months after completing RT, at which time DD did not progress in 90.6% of the treated extremities, while 9.4% progressed. Among non-progressors, 21.2% remained stable, 65.9% partially improved, and 3.5% achieved a complete response. Univariate logistic regression revealed no significant associations between progression and race, sex, age >65, family history, prior surgery, or previous disease history.

Conclusions: In this cohort of DD patients, RT achieved local disease stability or regression in 90.6% of treated extremities in a short-term follow-up. When asked, 79.1% of patients reported satisfaction with the results. They felt a softer hand with restored ability to perform tasks such as comfortably driving and playing golf. With 14.1% of treated hands requiring surgical salvage post-RT, this demonstrates RT's potential to preserve hand function by maintaining the fibrotic balance of the palmar fascia at least in the short term. Baseline factors were not predictive of progression, although data limitations should be noted, as the majority of treated patients were Caucasian and had early-stage DD. RT represents a non-invasive approach to restore equilibrium between fibroproliferation and tissue remodeling, thereby potentially delaying the need for surgery, or if a surgery is needed in the future, a simpler one could be offered.[4,5] Limitations include retrospective design, modest sample, and single-institution scope, and short-term follow-up. Future studies will expand cohort size, refine ancestry data, and extend follow-up.

A-0299 TREATMENT CRITERIA FOR ULNAR NERVE PALSY ASSOCIATED WITH DISTAL RADIUS FRACTURE: A REPORT OF TWO CASES AND LITERATURE REVIEW

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Introduction: Ulnar nerve palsy associated with distal radius fracture (DRF) is rare compared with median nerve injury, and its management remains controversial. We report two cases and review the literature to propose treatment criteria for this condition.

Case 1: A 30-year-old man sustained a DRF after a simple fall. Following open reduction and internal fixation (ORIF), he developed hypoesthesia in the little finger and a clawing deformity. Electrophysiologic examination revealed incomplete ulnar nerve palsy, while imaging showed no structural abnormalities. Neurological symptoms gradually improved, and full recovery was achieved within six months without surgical intervention.

Case 2: A 66-year-old man sustained an open DRF after falling from a ladder. After initial ORIF at another hospital, the fracture dislocated, and he was referred for revision surgery. He complained of hypoesthesia in the ring and little fingers. Electrophysiologic testing revealed complete palsy. Neurolysis was performed two months after injury, revealing severe adhesion and compression of the ulnar nerve by scar tissue. Sensory function fully recovered by four months postoperatively.

Literature Review: A PubMed and Ichushi (Japanese database) search identified 49 previously reported cases of ulnar nerve palsy associated with DRF. Including our two cases, a total of 51 cases were analyzed. The condition predominantly affected young males (mean age, 35 years; male-to-female ratio, 5:2) and was typically associated with high-energy trauma and severe displacement. Open fractures accounted for 16% of cases. Nerve injury patterns were classified into three types: (1) direct injury (laceration or rupture), (2) persistent compression, and (3) transient neurapraxia. In the first two types, decompression or reconstruction performed within three months generally led to favorable outcomes, whereas delayed intervention beyond eight months often resulted in poor recovery. Some cases showed worsening of palsy after fracture reduction due to entrapment of the ulnar nerve at the fracture site. In the third type, transient neuropathy cases treated conservatively tended to show signs of recovery within three months. Surgical intervention within six weeks in such cases may represent premature decision-making.

Discussion: Based on our findings, early surgery is advisable when any of the following are present: acute neurological deterioration after reduction, imaging suggesting direct nerve injury, progressive palsy over time, or absence of recovery beyond ten weeks. In these situations, surgical exploration within three months is recommended. Conversely, when recovery signs are evident within three months, careful observation remains appropriate.

Conclusion: Ulnar nerve palsy associated with DRF can result from direct injury, persistent compression, or transient neurapraxia. Timely differentiation based on clinical and imaging findings is essential. Surgical intervention within three months is recommended for cases showing progression or no recovery, while conservative management may suffice for transient neuropathies.

A-0300 DRUJ SUBLUXATION FOLLOWING AN EXTRA-ARTICULAR DISTAL RADIUS FRACTURE

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Introduction: Distal radio-ulnar joint (DRUJ) problems are common follow distal radial fracture (DRF). We observed cases of DRUJ subluxation shown radiologically as well as clinically.

Aim: To assess whether some patients had DRUJ subluxation following an extra-articular distal radius fracture and if so how frequently it occurs.

Methods: We reviewed radiographs of 192 consecutive, extra-articular (metaphyseal) distal radius fractures in 190 adults. We assessed fracture patterns and any ulnar styloid fracture. We recorded demographics. We assessed ulnar head alignment relative to the distal radius on lateral radiographs and increased DRUJ gap on postero-anterior radiographs.

Results: There were 176 women and 14 men with overall mean age of 73. 14 had inadequate longer-term radiographs. Of 178 fractures, 21 (12%) had ulnar head subluxation of $\geq 25\%$ in 20 women and one man; on the right in 9 and on the left in 12 patients.

15 of 21 (71%) had an ulnar styloid fracture compared to 58 % overall (NS).

10 ulnar heads subluxed dorsally, $\geq 25\%$ - 49% in 7 and $\geq 50\%$ in 3. 11 subluxed volarly, $\geq 25\%$ - 49% in 9 and $\geq 50\%$ in 2. 5 cases with DRUJ subluxation had an increased gap on PA radiographs; 2 dorsal subluxations and 3 volar. No case without DRUJ subluxation had an increased DRUJ gap.

There was no correlation with the fracture direction on the lateral radiograph i.e. Colles' or Smith's type fractures and the direction of DRUJ subluxation

On the last available radiographs in the patients with DRUJ subluxation the mean radial inclination was 19 degrees, the mean shortening 2 mm and mean dorsal tilt 3 degrees. For all the fractures the mean radial tilt was 19 degrees, mean shortening 2 (range 0-10) mm and mean dorsal tilt 8 degrees (NS).

16 fractures with DRUJ subluxation had primary treatment of MUA and PoP, 2 had K wiring and 3 had ORIF. For all the fractures 146 had MUA/PoP, 20 had K wiring, 11 had ORIF and one had dorsal bridge plating (NS). Patients with DRUJ subluxation were more likely to have had surgery primarily ($p = 0.039$).

Conclusion: DRUJ subluxation is common following DRF but that has not been appreciated. It may contribute to the outcome of treatment of these injuries. The study further confirms a continuum of instability from mild (typically asymptomatic) DRUJ instability through to acute subluxation.

A-0301 IS ARTHROSCOPIC-ASSISTED TREATMENT APPLICABLE FOR THE TREATMENT OF PEDIATRIC SCAPHOID NONUNION?

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Introduction: Pediatric scaphoid fractures and nonunion are rare due to anatomical characteristics. It has not yet been established how pediatric scaphoid nonunion should be treated. Therefore, the optimal treatment of a pediatric scaphoid nonunion remains controversial. Immobilization can be attempted but has several limitations. Thus, surgical treatment has become more widely accepted in the pediatric population. Various surgical techniques have been used in pediatric scaphoid nonunion but there have been no reports of arthroscopic-assisted treatments in pediatric scaphoid nonunion.

Aim: The authors present clinical results of arthroscopic-assisted bone grafting and K-wire fixations for pediatric scaphoid nonunion.

Material & Methods: A retrospective analysis was conducted on 6 pediatric patients with scaphoid nonunion treated with arthroscopic bone grafting and K-wires fixation method from November 2009 to August 2021. 3 distal third, 2 mid-third and 1 proximal third fractures were included. During arthroscopy, debridement and synovectomy were initially performed and punctate bleeding in both ends of the nonunion site was identified in all patients. After preparing the

bone graft, the scaphoid was reduced under the C-arm image intensifier and a 1.2mm K-wire was inserted percutaneously for provisional scaphoid fixation. Position of the K-wire was confirmed under arthroscopic view before proceeding to the bone graft. For bone grafting, an arthroscope was introduced in the MCU portal to continuously show the nonunion site, custom made 3.8 mm cannula was introduced to the nonunion site through the MCR portal, and cancellous chip bone was delivered to the entrance of the cannula. An autogenous iliac bone graft was performed in 3 patients and a bone substitute graft was performed in 3 patients. After bone grafting, definitive fixation with two 1.2 mm K-wires was performed. Postoperatively, thumb spica splint and cast were applied for 8 weeks. Bone union was assessed using serial plain radiographs and computed tomography. Functional outcome was evaluated comparing range of motion (ROM), grip strength, the modified Mayo wrist score, Quick disabilities of the arm, shoulder, and hand (DASH) score, and visual analogue scale (VAS) at preoperatively and last follow up. Radiologic assessment with scapholunate (SL) angle and radiolunate (RL) angle was compared between preoperative and last follow up.

Results: Complete union was achieved in all patients. The average radiologic union time was 9.8 weeks. Functional outcomes including ROM (% of that of normal side, 77→94), grip strength (% of that of normal side, 67→92), average VAS (4.2→0.8), quick DASH score (40.15→7.58) and modified Mayo wrist score (53.33→80.00) improved significantly. Radiologic outcome showed significant improvement with SL angle (59.83→50.92).

Conclusions: The authors suggest arthroscopic-assisted treatment may be a good treatment method for pediatric scaphoid nonunion.

A-0302 SOFT TISSUE RECONSTRUCTION USING ARTERIALIZED VENOUS FREE FLAP AFTER RESECTION OF SOFT TISSUE TUMOR IN THE HAND

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Introduction: Malignant tumors in hand are extremely rare and present a significant challenge. In present, advances in diagnostic tools and adjuvant treatments have led to limb-sparing surgery that offers functional and aesthetic advantages. However, it often results in soft tissue defects after tumor resection and requires soft tissue reconstructions. Conventional flaps are often limited by size, orientation, location and flap thickness. In contrast, arterialized venous free flaps offer advantages, particularly for hand reconstruction, providing hand-like texture, ensuring versatility in templating flap size and shape, being easier to harvest. However, because of their unique hemodynamics, there have been very limited reports on the use of arterialized venous free flaps for hand reconstruction following tumor excision.

Aim: The authors present clinical results using arterialized venous free flaps to reconstruct defects following soft tissue tumor excision and suggest it could be a valuable treatment option for reconstruction after soft tissue tumor resection.

Material & Methods: A retrospective analysis was conducted on 4 patients who underwent arterialized venous free flap for hand reconstruction after soft tissue tumor resection between June 2016 and July 2020. The pathological causes were malignant melanoma, synovial sarcoma, malignant giant cell tumor, and recurrent epidermoid cyst. Tumor locations were the palm in two cases, the dorsum in one case, and the right long finger (RLF) in one case. The ipsilateral distal forearm and the contralateral distal forearm were used as donor sites. The flap-related factors were also assessed. Flap size, vascularity of the recipient site, number of afferent and efferent vessels, and characteristics of the flap (cutaneous or composite flap) were obtained. Postoperative follow-up period, postoperative immediate complications, donor site complications, existence of recurrence or metastasis and postoperative range of motion (ROM) of the hands and fingers were measured for all patients.

Results: The flaps survived well in all the patients without immediate postoperative complications. The mean follow-up period of the flaps was 41.75 ± 9.09 months. All recipient bed vascularity was good and rich. Recurrence or metastasis was not found, except in one case. Kaplan-Meier survival analysis for metastasis was performed and restricted mean survival time was 57.00 ± 12.99 months. The color and texture of the flap were satisfactory in all the patients. Functional outcomes assessed and showed no limitations of ROM except one case involving RLF. Donor-site complications were not observed in any patients.

Conclusions: The authors suggested that limb-sparing surgery should be performed rather than salvage techniques for soft tissue tumor surgery of the hand. We believe that the arterialized venous free flap is a more valuable reconstruction option than other reconstruction techniques after soft tissue tumor resection in the hand. It presents better results than do post-traumatic hand reconstruction

A-0303 NOVEL CORONOID RECONSTRUCTION USING PATIENT-SPECIFIC 3D-METAL PRINTED PROSTHESIS AND GUIDE FOR IRREPARABLE COMMINUTED CORONOID PROCESS FRACTURE

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Background/Objectives: The coronoid process is essential for elbow stability, and its severe comminuted fractures may require coronoid reconstruction. While coronoid reconstruction using autologous bone grafts has shown positive clinical outcomes, it has inherent limitations that create uncertainty in its outcomes. To our knowledge, while the potential for coronoid prostheses has emerged, there are currently no commercially available options, and clinical results remain insufficient. Thus, this study aimed to develop a new patient-specific coronoid prosthesis using three-dimensional (3D) metal printing technology and to report clinical outcomes in patients with comminuted coronoid fractures where fixation was not feasible.

Methods: We conducted a study using two cadavers to develop a coronoid prosthesis and to identify the optimal surgical approach, which was then applied to two patients with irreparable comminuted coronoid fractures.

Results: We designed an integrated prosthesis and cutting guide, achieving favorable clinical outcomes with over 1 year of follow-up. In our patient-specific coronoid prosthesis, radiological assessments revealed no irregularities on the joint surface and no prosthesis-related complications were identified. Complete bony integration of the reconstructed area was confirmed approximately 6 months postoperatively, which can be attributed to the titanium mesh structure in the reconstruction area.

Conclusions: Our patient-specific coronoid prosthesis, developed using 3D printing technology, achieved good clinical and radiological outcomes with anatomical conformity. Our novel approach may improve recovery and function in patients with irreparable comminuted coronoid fractures, offering a promising alternative treatment option.

A-0304 COMPARISON OF OUTCOMES BETWEEN PRIMARY TOTAL ELBOW ARTHROPLASTY AND PLATE OSTEOSYNTHESIS IN DISTAL HUMERUS FRACTURES WITH CONCOMITANT OSTEOPOROSIS

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Introduction: The aim of this study is to compare the functional and radiographic outcomes of total elbow arthroplasty and open reduction and internal fixation (ORIF) in patients with distal humerus fractures (DHF) accompanied by osteoporosis, with a follow-up period of at least three years.

Materials and methods: We conducted a retrospective analysis of 150 patients diagnosed with DHF who underwent surgical intervention between January 2005 and December 2019. We included 46 patients with a DEXA score of -2.5 or lower, followed for more than three years, and excluded those with nonunion or requiring revision surgery. The study consisted of 33 patients in the ORIF group and 13 patients in the TEA group. Functional outcomes included elbow motion assessments and scores from the Mayo Elbow Performance Score (MEPS), Disabilities of the Arm, Shoulder, and Hand (DASH), and pain measured by the visual analog scale (VAS). Radiographic outcomes assessed periprosthetic fractures, implant loosening, and infections.

Results: After more than three years of follow-up, the ORIF group reported significantly lower pain VAS scores compared to the TEA group. Functional outcomes as measured by MEPS and DASH scores showed no significant differences between the groups, although the TEA group scored higher in the motion subgroup of the MEPS. In terms of radiographic outcomes, aseptic loosening was observed in 30.8% of the TEA group, with none in the ORIF group. Ulnar nerve symptoms were similar in both groups.

Conclusion: No significant differences were found in functional outcomes between TEA and ORIF in patients with DHFs and osteoporosis. However, the TEA group exhibited poor radiographic outcomes, primarily due to high rates of aseptic loosening. Therefore, caution is advised when considering primary TEA as the first treatment option for osteoporotic DHFs.

A-0305 MEDIAN NERVE NEUROPATHY AFTER FLEXOR POLLICIS LONGUS TENDON RECONSTRUCTION

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Introduction: To treat flexor pollicis longus (FPL) muscle function loss, the 4th flexor digitorum superficialis (FDS) to the FPL tendon transfer is preferred as a reconstruction method. The Pulvertaft weave technique is frequently used for reconstruction, providing sufficient strength to withstand early exercise. Complications of tendon transfer have been reported, including adhesion and failure. However, median nerve neuropathy has not been reported yet.
Aim: The authors report a case of median nerve neuropathy caused by irritation of tendon suture knots in the 4th FDS tendon transfer using the Pulvertaft weave technique for FPL tendon reconstruction.
Material & Methods: A 52-year-old male patient complained of right thumb flexion limitation. He had a history of radius shaft open fracture 9 years ago and nonunion with metal failure 7 years ago. During nonunion surgery, there was severe adhesion in the FPL muscle but the continuity remained intact. In physical exam, active flexion of thumb IP joint was not possible. Ultrasonography showed continuity of FPL but no contraction of muscle in dynamic view. Electromyography showed no abnormality. The patient was diagnosed with FPL function loss due to muscle adhesion. 4th FDS to FPL tendon transfer was performed to restore function. The 4th FDS tendon was harvested and transferred to the FPL tendon using the Pulvertaft weave technique

with a 4-0 prolene suture at the wrist level. Postoperatively, a dorsal block splint was applied and exercises began after 1 week. During active extension-passive flexion exercises with dynamic splint, the patient complained of paresthesia and tingling in right index and middle fingers. He was clinically diagnosed with median nerve neuropathy caused by irritation of tendon suture knots. Despite immobilizing with splint, there was no improvement in symptoms. Thus, exploration was performed to remove tendon suture knots. **Results:** Intraoperatively, the median nerve was irritated by prolene knots at the suture site of the transferred tendon. Prolene knots were removed and tendon transfer sites showed signs of healing. After the exploration, symptoms gradually resolved. An additional 6 weeks of exercise with a dynamic splint was performed. Postoperatively 12 months, all median nerve irritation symptoms improved. On physical examination, active flexion of the right thumb IP joint was 80°. **Conclusions:** Nerve irritation could be a possible complication of tendon reconstruction and should be prevented. We recommend the preventive method to cover tendon suture knots using surrounding tissue such as deep transverse carpal ligament.

A-0306 THE OUTCOME OF PRIMARY TOTAL ELBOW ARTHROPLASTY FOR ACUTE DISTAL HUMERUS FRACTURE AT MID TERM FOLLOW-UP

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Background: Acute distal humerus fractures can cause severe disability and morbidity in the affected patients. Primary total elbow arthroplasty (TEA) is one of the treatment options for complex distal humerus fractures and is commonly considered for patients with poor bone quality. Our purpose was to evaluate the mid-term outcomes of primary TEA for acute distal humerus fractures in a single institution.

Methods: We retrospectively reviewed the medical records of 21 patients who underwent primary TEA for acute distal humerus fractures between January 2005 and December 2017. We excluded patients with less than five years of follow-up, a total of 16 patients (16 elbow) were included in our study group. The mean follow-up period was 6.4 years. Four patients had rheumatoid arthritis (RA). At the last follow-up, we measured the degree of pain relief, range of motion, and functional outcome. Functional outcome was assessed using the Mayo Elbow Performance Score and Disabilities of Arm, Shoulder and Hand score (DASH score), and grip power was measured in both the affected and unaffected elbow. Radiological evaluation was performed using elbow anterior to posterior and lateral views to assess implant complications such as loosening and fracture.

Results: The results showed that primary TEA provided satisfactory pain relief and functional improvement in most patients, with a mean Mayo Elbow Performance Score of 81.5 and DASH score of 10.5. Mean visual analog scale for pain of 2.0 at the last follow-up. The mean flexion was 122 degrees and mean range of motion (ROM) was 108 degrees. Complications were noted in one patient with a periprosthetic fracture on the humeral side. There were no other complications. The grip power was measured as an average of 16 for the unaffected limb and 15 for the affected limb.

Conclusions: In conclusion, primary total elbow arthroplasty is an effective surgical option for patients with severe elbow pain and functional limitations. Our study demonstrated that the majority of patients experienced pain relief and improvement in functional outcomes.

A-0307 WHICH ARE MORE COMMON; RIGHT OR LEFT DISTAL RADIAL FRACTURES?

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Introduction: Distal radial fractures (DRF) are common. Whilst it is established that falls in children lead to more injuries on the left than the right this is not established in adults.

Aim: The aim of this study was to review the published literature to assess whether adult distal radial fractures were more common on the left than the right and more common on the non-dominant or dominant side.

Methods: A literature review was performed. We found 1726 papers possibly related to dominance and 1571 related to laterality in adults. After review of the abstracts there were 41 possible papers to review in full related to dominance and 144 related to laterality. The full papers were analysed. We chose 250 as a minimum number of cases to reduce selection bias. The numbers of injuries were summed.

Results: There were nine studies where we could extract data on the side of injury. Three were from national databases (92%) cases. The remainder were from hospital studies. Overall, there were 47,959 distal radial fractures of which 26,534 (55.3%) were left and 21,425 (44.7%) were right ($p < 0.0001$). The relative percentages were similar in all studies. In none was injury on the right side more common than on the left.

In the one study on the “super-elderly” [Sagerfors et al. 2022] there were 8,486 fractures; 4,812 (56.7%) were on the left and 3,674 (43.3%) on the right.

Based upon a typical mean of 10% of the population being left-handed the data imply injuries to the non-dominant wrist in 55.3% and the dominant in 44.7% ($p < 0.0001$). In the two studies reporting hand dominance there were 1738 fractures, 935 (53.8%) affecting the non-dominant side and 803 (46.2%) the dominant ($p < 0.0001$).

KLS Martin report selling c. 57% left and 43% right-sided volar locking plates.

Conclusion: The study shows that distal radial fractures occur significantly more often on the left side and to the non-dominant hand. This is confirmed in the data from studies of fracture fixation reporting injury side and with the data of distal radial plate use. Why there is this difference is unclear.

A-0308 KEY PINCH RESTORATION AFTER HIGH ULNAR NERVE INJURIES USING THE BERTELLI NERVE TRANSFER: A CASE SERIES

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High ulnar nerve injury commonly leads to severe intrinsic hand muscle weakness and sensory deficits in the ulnar digits. In 2018, Bertelli described a novel nerve transfer technique utilizing the motor branch of the opponens pollicis (OPB) to reinnervate the terminal division of the deep branch of the ulnar nerve (TDDBUN) with the goal of restoring key pinch. In this case series we report our preliminary experience with this technique in four patients who presented with intrinsic denervation following high ulnar nerve injury.

Four patients with confirmed proximal ulnar nerve injury were treated in our center, three of them were due to iatrogenic nerve injury following upper extremity surgery. Diagnosis was made by nerve imaging, electroneuromyography, and clinical examination, demonstrating loss of intrinsic function with a positive Froment sign and claw hand deformity. All patients underwent nerve transfer surgery in which, among others, the OPB motor branch was connected to the TDDBUN in the first commissure. Mean postoperative follow-up for all patients was 6 (2-12) months.

Three patients were operated in 2024 and one in early 2025. Follow-up evaluations for the first patients demonstrated early functional recovery, with increasing function of the 1st interosseus and adductor pollicis muscles. Key pinch strength reached 47% (44-50) compared to the contralateral side in 3 patients at a mean follow up of 8 (3-12) months. The fourth patient was recently seen for her first follow-up 6 weeks after surgery and did not yet show measurable improvement. Notably, all patients reported subjective improvement in pain symptoms. Thumb opposition was strong and reached Kappandji 10 in all patients.

While longer follow-up and larger case series are required to draw definitive conclusions, our initial findings support the efficacy of the OPB-to-TDDBUN nerve transfer to restore key pinch function following high ulnar nerve injuries without significant donor morbidity.

A-0309 COMPARISON OF MANUAL VERSUS MOTORIZED CUP REAMING IN THUMB TRAPEZIOMETACARPAL TOTAL JOINT ARTHROPLASTY

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Introduction: The optimal technique for preparing the trapezium during thumb carpometacarpal (CMC1) joint replacement remains uncertain. Manual and motor-powered reaming are both used, each offering theoretical benefits and drawbacks. Manual reaming may provide tactile feedback and control, while motor-powered reaming is hypothesized to deliver greater precision and consistency. This study aimed to evaluate the differences between these two techniques in terms of accuracy, shape uniformity, and clinician variability, using simulated bone models.

Methods:

To simulate different bone qualities, we utilized rigid polyurethane foam blocks of densities 15 PCF (osteoporotic bone) and 25 PCF (standard bone). These blocks provide consistent properties in the range of human cancellous bone, despite not replicating its microstructure. A total of 606 trapezium models (303 per density) were reamed using standard Kerimedical® Touch prosthesis instrument sets, with manual and motor-powered techniques performed by both novice and expert clinicians. The reamed cavities were evaluated for dimensional accuracy and uniformity using micro-CT scans. Parameters assessed included hole diameter, depth, shape deviation and rugosity (roughness).

Results: Motor-powered reaming demonstrated significantly reduced toggling compared to manual reaming. Cavities prepared with motor-powered reaming were more consistent in diameter and shape providing a uniform geometry better suited for cup insertion. Manual reaming, in contrast, showed greater variability in outcomes, particularly among novice clinicians. There was no difference in depth between two techniques, but novices reamed deeper holes despite the technique. Soft bone was more sensitive to error.

Conclusions: Motor-powered reaming is superior to manual reaming in achieving consistent, uniform trapezium cavities with minimal toggling, making it the preferred technique for trapezium preparation in thumb CMC1 joint replacement. However, slower reaming speeds are advised to mitigate the risk of thermal necrosis. Further research is necessary to evaluate in-vivo outcomes, especially comparing secondary loosening and heterotopic ossification.

Keywords:

Thumb CMC1 joint replacement, trapezium preparation, manual reaming, motor-powered reaming, surgical techniques, micro-CT analysis, orthopedic research.

A-0310 EFFECT OF FERMENTED PAPAYA PREPARATION ON ANTI-INFLAMMATORY AND ACUTE WOUND HEALING PROCESS

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Introduction: Controlling excess inflammation in acute wounds is crucial for optimal postoperative recovery in hand surgery. Fermented papaya preparation (FPP), a natural product derived from the yeast fermentation of *Carica papaya* Linn., has been reported to possess antioxidant, anti-inflammatory, and immunomodulatory properties. While FPP has been shown to enhance wound repair in diabetic mouse models characterized by chronic inflammation, its effect on acute wound healing in healthy subjects remains unknown.

Aim: This study aimed to investigate whether oral FPP supplementation promotes acute wound healing in healthy young mice.

Material & Methods: Seven-week-old female C57BL/6J mice were randomly assigned to FPP (group F) or control groups (group C) (n = 7 each). Mice received daily oral supplementation of FPP or D-glucose at a dose of 0.2 g/kg body weight for 5 days prior to wounding and throughout the study period. Two 8-mm full-thickness excisional wounds were created on the dorsal skin. Wound areas were quantified from digital images using ImageJ. On day 3 post-injury, blood samples were collected to measure oxidative stress (d-ROMs and BAP test), and wound tissues were processed for CD68 immunohistochemical staining. The ratio of the CD68-positive area was normalized to the epithelial area.

Results: The wound area ratio on day 2 was significantly lower in group F than in group C (0.42 ± 0.14 vs. 0.61 ± 0.13 , $p < 0.01$). The mean d-ROMs value was significantly lower in group F than in group C (95.4 ± 8.9 vs. 125.7 ± 27.5 , $p < 0.05$). Although no significant differences were observed in BAP levels between groups, systemic oxidative stress was reduced in the FPP group. In addition, CD68-positive macrophage infiltration within the wound area was significantly decreased compared with controls (0.08 ± 0.15 % vs. 0.51 ± 0.50 %, $p < 0.01$).

Conclusions: Although a basal level of oxidative stress is necessary for initiating early wound healing responses, excessive oxidative stress, particularly that generated by activated inflammatory macrophages, can impair orderly tissue repair. In this study, FPP accelerated acute wound closure and attenuated macrophage-derived oxidative stress, promoting a smoother transition from the inflammatory to the proliferative phase. These findings suggest that FPP may serve as a safe nutritional adjunct that enhances acute wound healing even under physiologically optimal conditions.

A-0311 FIXATION OF ULNAR STYLOID BASE FRACTURE WITH HEADLESS COMPRESSION SCREW IN DISTAL RADIUS FRACTURE

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Introduction Ulnar styloid fractures are frequently associated with distal radius fractures, occurring in up to 60% of cases. If left untreated, an ulnar styloid fracture can result in symptomatic non-union or instability of the distal radioulnar joint (DRUJ). We sought to analyze a cohort of patients with concomitant ulnar styloid base fractures treated with headless cannulated compression screw (CCS) to assess its effectiveness in stabilizing the fracture and restoring DRUJ stability.

Methodology Between 2021 and 2024, a total of 23 patients with surgically treated distal radius fractures and concomitant ulnar styloid base fractures were included in the study. These fractures were identified as unstable based on the DRUJ ballottment test following the fixation of the distal radius. The surgical approach involved the use of a 1.7mm cannulated

compression screw (Medartis, Basel, Switzerland) for fixation of ulnar styloid base fracture. Post-operatively, all patients were placed in a resting wrist splint and began gentle flexion and extension exercises. After 2 weeks, pronation and supination exercises were introduced. Clinical and radiographic assessments were conducted at 6 weeks, 3 months, and 6 months following surgery.

Results Out of the 23 cases treated, 20 achieved radiological bony union of the ulnar styloid base fracture. The mean range of motion (ROM) for pronation was 80 degrees, and for supination, it was 70 degrees. Additionally, all patients had a stable DRUJ. 6 out of 23 patients developed sensory neuropraxia of the dorsal sensory branch of the ulnar nerve, which gradually resolved over time. There were no cases of implant breakage or screw backout. All patients demonstrated satisfactory recovery, with most returning to work within 6 months post-surgery.

Conclusion The cannulated compression screw (CCS) provides a low-profile, minimally invasive, and reliable method for the anatomical fixation of unstable ulnar styloid fractures associated with distal radius fractures. The procedure resulted in a high rate of union and stable DRUJ, with minimal complications. The use of this technique is recommended as an effective treatment for patients with concomitant distal radius and ulnar styloid fractures requiring surgical intervention.

A-0312 A CLINICAL STUDY ON RADIATION PROTECTION STRATEGIES IN SURGERY FOR DISTAL RADIUS FRACTURES

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Surgeon radiation exposure during distal radius fracture surgery remains a concern. We compared exposure under continuous fluoroscopy (Group C), 8-pulse mode (Group P), and 8-pulse mode with tungsten gloves (Group G). Seventy-eight cases treated with volar locking plates (C:24, P:25, G:29) were analyzed for operative time, fluoroscopy time, dose, and equivalent dose at six anatomical sites using cumulative dosimeter badges. Fluoroscopy time per case decreased by 55.6% in P and 53.5% in G vs. C. Thumb dose was reduced by 54.8–64.3% in P and 84.4–86.7% in G. No significant differences were found in lens or thyroid dose; chest and abdomen levels were below detection. Pulse mode and tungsten gloves effectively reduced exposure and are recommended protective strategies.

A-0313 CORRECTIVE OSTEOTOMY OF THE MALUNITED DISTAL RADIUS FRACTURE AND SCAPHOLUNATE LIGAMENT RECONSTRUCTION – A BALANCED APPROACH

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Introduction: Managing the scapholunate ligament (SL) injuries in combination with the malunited distal radius fractures is rarely discussed or provided clear guidelines for. The aim of the study was to evaluate the results of a one-step surgical correction of stages IV-V (IWAS classification) SL tears and distal radius malunion.

Aim: The aim of the study is in pursuing a rational approach to a combination of two pathological conditions of the wrist joint, when treating only one should not logically lead to a fully balanced wrist.

Material & Methods: The series of 5 cases was analyzed. In each case, patients presented with history of a malunited distal radius fracture and a SL tear.

Results: Preoperative mean wrist flexion was 68°, extension – 88°. Postoperative mean wrist flexion was 80°, extension

– 84°. Average VAS pain score before surgery was 5.5, DASH – 15.4, PRWE – 34. After over 1 year post-op, average VAS pain score before surgery was 0.5, DASH – 3.75, PRWE – 5. Preoperative CT scans before surgery revealed a pathological dorsal tilt of the distal articular surface of the radius (on average 14° from the longitudinal axis of the radius) and a dorsal subluxation of the scaphoid (PRSA on average was 109°), which were corrected in all cases (the average tilt of the distal articular surface of the radius was 2° – palmar; the average postoperative PRSA – 93°).

Conclusions: While current research on the topic is lacking, the separate issues of distal radius fracture malunion and the consequences of scapholunate ligament injuries remain well discussed. The simultaneous combination of the distal radius malunion management and scapholunate stabilization can have excellent results.

A-0314 FROM 12 QUESTIONS TO 4: A SHORTER, ALGORITHM-BASED BRIEF MICHIGAN HAND OUTCOMES QUESTIONNAIRE REMAINS VALID FOR OUTCOME ASSESSMENT IN HAND PATIENTS

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Introduction: For patient-reported outcomes measures (PROMs), there is a shift away from traditional PROMS to algorithm-based scores to reduce completion time. For the 12-item brief Michigan Hand Outcomes Questionnaire (MHQ) (range 0-100), a popular PROM measuring hand function, no algorithm-based version is available yet.

Aim: This study aims to shorten the brief MHQ by developing an electronic algorithm-based version.

Material & Methods: Based on two prospectively collected datasets of complete questionnaire responses in the Netherlands (N > 72,000) and Switzerland (N > 5000), we applied the chi-squared automated interaction detection method to develop and validate a decision tree capable of reliably predicting the brief MHQ score using fewer items. The Dutch dataset contained full MHQ responses from patients treated for single-hand conditions. This dataset was used to develop the model by retrospectively calculating the brief MHQ score and restricting the input variables to the twelve items that comprise the brief MHQ. The Swiss dataset, containing brief MHQs, was used for external validation. The performance of the resulting shortened decision tree questionnaire was evaluated using the intraclass correlation coefficient (ICC) and Bland–Altman analyse to assess agreement and measurement bias.

Results: The number of questions for the developed decision tree was reduced from 12 to 4 questions compared to the original brief MHQ questionnaire. Patients only see items that are relevant to their condition. The ICC between the original and predicted score for the decision tree version was 0.94. The mean difference between the original and predicted score was 1.43 (SD ±7.76). The Bland–Altman plot showed errors tightly clustered around zero, indicating a high level of agreement between the predicted and original scores.

Conclusions: We developed and validated an algorithm-based brief MHQ that substantially reduces the number of items from 12 to 4 while maintaining high psychometric validity. This shortened version presents the next relevant question based on the patient's previous response, enabling accurate calculation of the final score while substantially reducing completion time.

A-0315 JIDABOKUIPPPO REDUCES SOFT-TISSUE SWELLING AFTER OPEN REDUCTION AND INTERNAL FIXATION FOR DISTAL RADIUS FRACTURES

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Introduction: Soft-tissue swelling after distal radius fracture (DRF) fixation often causes postoperative pain and delays in rehabilitation, making its reduction a clinically important issue. Jidabokuippo is a traditional Japanese Kampo formula historically used for contusions and sprains, and its anti-inflammatory and anti-edematous effects have recently been applied in orthopedic practice.

Aim: This study investigated whether administration of Jidabokuippo reduces postoperative soft-tissue swelling following volar plating for DRF.

Material & Methods: A retrospective cohort study was conducted on 51 patients (June 2023–June 2025) who underwent standard volar plate fixation for DRF by a single surgeon. Since September 2024, our institutional protocol was revised to routinely administer Jidabokuippo from the time of injury. Based on this change, patients were divided into a Jidabokuippo-treated group (n = 22) and a control group without the medication (n = 29). The primary outcome was the soft-tissue to bone ratio (width of radius/ulna divided by total soft-tissue width) measured on anteroposterior radiographs at the distal radioulnar joint level immediately postoperatively, at 2 weeks, and at 3 months.

Results: The mean duration of Jidabokuippo administration was 6.3 ± 3.7 weeks. There were no significant differences between groups in age, sex, time to surgery, operative time, or anesthesia type. At 2 weeks postoperatively, the soft-tissue to bone ratio was significantly higher in the Jidabokuippo group compared with the control group (0.834 vs. 0.812, $p = 0.019$), indicating less soft-tissue swelling. No significant differences were observed immediately after surgery or at 3 months.

Conclusions: Administration of Jidabokuippo significantly reduced soft-tissue swelling at 2 weeks after DRF surgery. This effect may be attributed to its antiphlogistic and anti-congestive actions that mitigate acute postoperative inflammation. Early attenuation of postoperative edema may contribute to improved pain relief, better digital motion, and smoother rehabilitation progress. Jidabokuippo may be an effective adjunct therapy for reducing early postoperative soft-tissue swelling after volar plate fixation of distal radius fractures.

A-0316 ENHANCING DIAGNOSTIC TECHNIQUES FOR THUMB OSTEOARTHRITIS: A NEW CLASSIFICATION

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Introduction: Osteoarthritis affecting the first carpometacarpal (CMC), and the scaphotrapezial (STT) joints are among the most prevalent types of arthritis found in the wrist. These forms of osteoarthritis are typically examined independently, and discussions regarding thumb base pathology usually focus on the first CMC joint. While this method is technically correct, from a clinical point of view, we believe it is essential to consider the STT joint as part of the overall pathology affecting the thumb. The anatomical closeness often results in similar symptoms arising from pathologies in these areas, which can affect the functional condition of the thumb.

Aim: The primary aim is to investigate the relationship between osteoarthritis in the scaphotrapezial joint and the

first carpometacarpal joint. Additionally, we seek to establish a novel classification system that accurately reflects the interdependence of these two joints in the context of osteoarthritis.

Material & Methods: 100 hands were examined in this study, 50 female and 50 male, aged between 18 and 76 years. We used computed tomography (CT) to measure the width of the CMC joint and the STT joint, aiming to identify signs of osteoarthritis. The randomized distribution of participants minimized systematic errors and enhanced the reliability of our findings. During the CT analysis, we employed specific anatomical landmarks on both sagittal and frontal projections. In the frontal view, a reference line was drawn along the axis of the second metacarpal bone, extending along its ulnar edge. For the sagittal projection, we established a line along the radius's axis, passing through the center of the articular surface. The width measurements were based on a line drawn along the ulnar edge of the radius, extending 1 cm radially. This segment was then divided into five equal parts for detailed analysis.

Results: According to the calculated Pearson correlation coefficient, the study revealed a correlation between age and narrowing of the STT joint gap in women (-0.311 , $p=0.028$) and in men (-0.594 , $p<0.001$), as well as between age and narrowing of the CMC in men (-0.383 , $p=0.006$) and in the general sample (-0.211 , $p=0.035$). A correlation was also found between narrowing of the STT joint and CMC both in the general sample (0.365 , $p<0.001$) and in the male subgroup (0.604 , $p<0.001$). 4 outliers were detected for STT values (3 for women (6%), 1 for men (2%)); 4 outliers were detected for CMC values (4 for men (8%)). As a result of the analysis of the collected data, a new classification of osteoarthritis of the joints of the base of the thumb was created.

Conclusions: The introduction of a new classification system for osteoarthritis at the base of the thumb represents a significant advancement in enhancing both diagnosis and treatment strategies for this condition. This classification encompasses 16 distinct combinations, each necessitating a specific therapeutic approach. To validate the effectiveness of this proposed system and facilitate its integration into clinical practice, further research is essential.

A-0317 POSTERIOR INTRADURAL CONTRALATERAL C7 NERVE TRANSFER: A FEASIBILITY STUDY USING HIGH RESOLUTION MRI AND CADAVERIC DISSECTION

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Introduction: Contralateral C7 (cC7) nerve transfer is an established option for restoring upper limb function in central mono- or hemiplegia. Conventional anterior prespinal routes often require interposition grafts and risk injury to anterior neck structures. A posterior intradural approach could enable direct root-to-root coaptation, avoiding grafts and reducing morbidity, but has not been attempted in live patients.

Aim: To assess the anatomical feasibility of a posterior intradural cC7 nerve transfer without grafts using high-resolution MRI and cadaveric dissection.

Material & Methods: MRI datasets from three adults without cervical pathology were reviewed. Bilateral C7 root lengths and spinal cord dimensions were measured using a multiplanar reconstruction protocol on 3D FIESTA sequences. A geometric model estimated the donor–recipient crossing distance intradurally. A fresh human cadaver was dissected to simulate the surgical approach, identify key landmarks, and determine if tension-free coaptation was achievable.

Results: All three MRI cases showed C7 root lengths exceeding the calculated crossing distance (mean excess length: X.X mm). Cadaveric dissection confirmed a shorter intradural crossing distance compared with published extradural values and allowed direct coaptation without grafts. No tension or kinking was observed during simulated cervical movements.

Conclusions: MRI-based measurements, corroborated by cadaveric simulation, suggest that posterior intradural cC7

transfer without grafts is anatomically feasible in selected patients. This graftless approach warrants cautious clinical exploration to validate its functional outcomes and long-term safety.

A-0318 MANAGEMENT OF SWAN-NECK DEFORMITY IN SPASTICITY - MY PERSONAL EXPERIENCE

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Introduction: Swan-neck deformity consists of flexion at the distal interphalangeal joint (DIP), hyperextension at the proximal interphalangeal joint (PIP) and flexion at the metacarpalphalangeal joint (MCP). This deformity is caused by an imbalance of intrinsic and extrinsic muscles in spasticity. It may be evident during the first examination of the patient, but it can also appear during treatment after procedures on the extrinsic muscles, when the swan-neck deformity is unmasked. Most often it is caused by mm.intrinsic contracture, when the Bunnell/Finocchietto test is positive, but swan-neck deformity also occurs with acquired or congenital laxity of the volar plate of the PIP, when this test is negative.

Aim: Swan-neck deformity makes difficult or completely impossible to grasp an object, because it is not possible to bend the PIP, the grip is pincer-like and the hand cannot be opened due to limited extension in the MCP. The goal is to change the position of the fingers, allowing the hand to open and the fingers to physiologically bend to enable grip.

Material & Methods: We have treated swan-neck deformity in 125 patients, in central spasticity, after stroke, brain injury and brain surgery and also once in spasticity in Parkinsonism. We evaluate PROM, AROM, Bunnell/Finocchietto test and House classification. Treatment of the cause of swan-neck deformity is the most important. In the intrinsic tightness we transfer lateral bands to the central slip of dorsal aponeurosis. This solves not only the hyperextension of the PIP, but also the flexion of the MCP. Therefore, the splint after surgery supports the extension of the MCP and allows the flexion of the PIP, the splinting is long-term, but early training finger flexion. In severe laxity of the PIP volar plate we stabilize the PIP with FDS slip in light semiflexion, in which we splint for a long time and also start the exercises as soon as possible.

Results: The authors compare the results of different methods for different diagnoses and their timing. In most patients, there was sufficient correction of the hyperextension of the PIP and release of the flexion position in the MCP, therefore the quality of their grip improved. Only one patient had a recurrence of the hyperextension of the PIP, one patient required tenolysis for greater flexion in the PIP - about 45 degrees, in 3 patients we operated repeatedly for a tendency to flexion in the MCP.

Conclusions: Methods must address the causes of the problem. Of the known techniques, we did not use Fowler's release-tenotomy of the middle band of the dorsal aponeurosis due to the risk of difficult-to-resolve overcorrection in spasticity. We did not have good experience with FDS tenodesis in our early days. We did not use lateral band mobilization due to the presumed insufficient effect in spasticity. The methods selected by us remained sufficiently effective and we plan to include stabilization of the PIP volar plate using a mini Mitek anchor or neurosurgery.

A-0319 SCAPULAR BALANCE AND ITS IMPACT ON FUNCTION AND PAIN OF THE UPPER EXTREMITY- A THERAPEUTIC MEDLEY

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Introduction: Scapular balance plays a critical role in the functional integrity and pain modulation of the upper extremity. Drawing on Thomas Myers' Anatomy Trains framework, this work shows how myofascial connectivity governs scapular posture and movement and how imbalances in this system contribute to dysfunction in the whole arm.

Aim: I demonstrate the importance of considering scapula balance in relation to problems in the upper extremities

Material & Methods: Using selected therapy film sequences, this study presents practical options for therapeutic intervention aimed at restoring scapular balance and illustrates the resulting functional outcome in the upper extremity.

Results: The study shows that participants with functional limitations and pain symptoms in the arm often correlate with an imbalance in the shoulder blade muscles and that this can also be treated therapeutically from there.

Conclusions: In order to restore a comprehensive balance, consideration should be given to extending hand therapy to more proximal regions as well.

A-0320 THREE-DIMENSIONAL MOTION ANALYSIS OF FINGER IN SPORT CLIMBING IN DIFFERENT AGE GROUPS

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Introduction: Pulley ruptures are the most common climbing injury and have been associated with more flexed proximal interphalangeal (PIP) joints. Our initial study on kinematics of finger joints during climbing revealed large inter-individual variation in PIP joint flexion, especially older climbers, who exhibited reduced angulation across different grip positions.

Aim: Consequently, the aim of this study was to compare finger joint motion between younger and older climbers.

Material & Methods: 9 young (< 45 years) and 11 old (> 45 years) elite climbers (climbing level of ≥ 23 on the IRCRA reporting scale) executed a defined boulder problem, featuring six holds. Kinematics of the fingers and the wrist was recorded by an optical motion capture system. The boulder was climbed using four distinct grip positions: crimp, half crimp, open-hand grip (excluding the little finger) and participant-selected grip (chosen freely by the climber). Additionally, osteophytes in the PIP and DIP joints were assessed using ultrasound.

Results: During the holding phase, PIP joint angle of the old climbers was 65° (SD 17.0°), 53° (16.7°), 33° (17.1°) and 56° (17.7°) in crimp, half-crimp, open-hand grip and self-selected position and 85° (11.4°), 75° (12.5°), 37° (24.4°) and 76° (10.2°) of the young climbers, respectively. Participant-selected grip position corresponded to the half-crimp position. 3 PIP and 6 DIP joints in young climbers, and 30 PIP and 36 DIP joints in old climbers had osteophytes. The presence of osteophytes correlated negatively ($p < 0.0001$) with PIP flexion during the crimp ($R = -0.54$), half-crimp ($R = -0.54$) and self-selected grip ($R = -0.48$).

Conclusions: This study revealed distinct biomechanical strategies in finger flexion between older and younger climbers during gripping tasks. Older climbers demonstrated significantly ($p < 0.0001$) reduced flexion at the PIP joints compared to their younger counterparts in crimp, half crimp and self-selected grip position. Similarly, overall a hyperextension of the DIP joints was observed for the young climbers whereas the older climbers showed slight flexion of the DIP in these tasks. Sonographically measured osteophytes were associated with reduced PIP flexion and possibly prevented hyperextension of the DIP joints.

A-0321 DEVELOPMENT OF AN AI-ASSISTED CLASSIFICATION SYSTEM FOR THUMB CARPOMETACARPAL OSTEOARTHRITIS

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Introduction: The Eaton-Littler classification is currently the standard for grading thumb carpometacarpal (CMC I) osteoarthritis (OA) but shows limited reliability and weak correlation with clinical symptoms and intraoperative findings. While artificial intelligence (AI) has achieved expert-level accuracy in classifying osteoarthritis in larger joints, no validated AI-based system exists for the CMC I joint. The lack of standardized, automated methods limits consistent grading and comparability across studies.

Aim: This work aims to develop a more objective and reproducible AI-assisted classification system for CMC I OA.

Methods: The development process consisted of several stages. First, established OA classification systems for the CMC I joint and for other joints (e.g., knee, hip) were reviewed to identify transferable structural features and design principles. In a series of expert discussions with hand surgeons and musculoskeletal radiologists, key radiographic and morphological parameters relevant for CMC I OA were defined. Based on these, a preliminary feature catalogue was developed, including trapezium and metacarpal morphology, joint space narrowing, subchondral cysts, osteophytes, subluxation, and scaphotrapeziotrapezoidal (STT) involvement. A dataset of around 1800 hand radiographs and 300 hand CT scans is currently being annotated according to the defined features. Interrater reliability and correlation with CT-based findings in a subset of images are being used to refine and select the most robust parameters. These features will form the foundation for a rule-based classification framework. Additionally, convolutional neural networks will be trained to automatically perform the feature labelling to compensate for the increased complexity of the new classification. **Results:** The proposed method integrates (1) expert-based feature definition, (2) reliability-guided feature selection, and (3) AI-assisted automation. This approach aims to ensure both clinical interpretability and technical reproducibility. Validation and performance evaluation of the AI models are ongoing, and the resulting classification framework will be presented at the conference.

Conclusion: This study outlines a structured development process for an AI-assisted classification of CMC I OA. Combining expert consensus, multimodal imaging, and automated analysis aims to establish a more objective, reproducible, and clinically meaningful alternative to the Eaton-Littler scale.

A-0323 CLINICAL OUTCOMES OF ULNAR SHORTENING OSTEOTOMY FOR ULNAR IMPACTION SYNDROME ASSOCIATED WITH TFCC TEARS

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Introduction: Ulnar-sided wrist pain is often difficult to diagnose accurately. Although recognition of triangular fibrocartilage complex (TFCC) tears has become widespread even among general orthopedic surgeons, it remains challenging to accurately identify cases complicated by ulnar impaction syndrome (UIS). Excessive ulnocarpal loading due to ulnar impaction can lead to persistent or recurrent pain after TFCC repair. Ulnar shortening osteotomy (USO) is a traditional and effective surgical

procedure for TFCC-associated ulnar wrist pain; however, it is invasive and may delay return to work or daily activities. Therefore, the indication for USO should be strictly defined — it should not be performed solely based on ulnar-positive variance, but limited to cases showing lunate cartilage degeneration confirmed by MRI or wrist arthroscopy. This study reports the clinical outcomes of patients with TFCC tears complicated by UIS who underwent simultaneous USO.

Aim: To evaluate the clinical outcomes of patients who underwent concomitant TFCC repair and ulnar shortening osteotomy for TFCC tears associated with ulnar impaction syndrome.

Material & Methods: Among 152 surgically treated TFCC lesions between 2007 and 2024, 35 patients (12 males, 23 females; mean age, 47 years; range, 16–75 years) with concomitant UIS who underwent USO were retrospectively analyzed. The mean interval from onset to surgery was 23.5 ± 24.1 months, and the mean follow-up period was 27.8 ± 14.9 months. Clinical evaluations included pain (Visual Analog Scale: VAS), grip strength, the Japanese Society for Surgery of the Hand (JSSH) clinical score, and postoperative complications. The indication for USO was strictly defined as ulnar-positive variance only when degenerative changes of the lunate cartilage were confirmed by MRI or arthroscopy. Surgically, TFCC repair was performed arthroscopically using a suture or suture tape passed through a bone tunnel created in the ulna (for foveal detachment), followed by ulnar shortening fixation, and final suture tightening after determining bone length.

Results: The mean shortening length was 2.3 ± 1.5 mm. Pain improved significantly, with the VAS decreasing from 72.2 ± 15.9 preoperatively to 2.0 ± 4.1 at the final follow-up. The grip strength ratio (injured/contralateral) improved from 83.7% to 97.4% (+13.7%). The mean JSSH clinical score at the final follow-up was 95.9 ± 2.8 , indicating excellent function.

Complications included one case (2.8%) of nonunion and four cases (11.4%) of mild distal plate irritation or discomfort.

Conclusion: In patients with TFCC tears associated with ulnar impaction syndrome, combined arthroscopic TFCC repair and ulnar shortening osteotomy resulted in significant pain relief and functional recovery. The procedure, in which the suture for TFCC repair is passed before shortening and final tightening is performed after determining bone length, provides both repair stability and biomechanical balance. Given the low complication rate, this combined technique represents an effective and safe treatment option for TFCC tears complicated by ulnar impaction syndrome, when the indication for ulnar shortening is strictly defined.

A-0324 IS THERE A DIFFERENCE IN THE TYPES OF INJURIES OCCURRING AROUND EACH FINGER JOINT AFTER A FALL?

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Introduction: Fractures of the fingers around joints are common especially following a fall. Different patterns of these injuries at each joint have not been highlighted or, by and large, explained.

Aims: The aims of this study were to gain an understanding of the relative incidences of bone and joint injuries around each finger joint after a fall on the outstretched hand, based upon a review of injuries at a single hospital over 1 year and validated by a Delphi review

Methods: The Delphi study assessed the perception of consultant hand surgeons about the frequency of peri-articular injuries following a fall. There were 97 injuries in 95 adults with a mean age of 42 (range 18–91) years.

Results: There were 52 men and 43 women. There were 28 injuries around the distal interphalangeal joint, 54 injuries around the proximal interphalangeal joint and 15 injuries around the metacarpophalangeal joint. The commonest injuries were bony mallet injuries, palmar plate injuries and dislocations of the proximal interphalangeal (PIP) joint and transverse fractures of the base of the proximal phalanx (a metacarpo-phalangeal – MP – joint injury). Seventeen consultant hand surgeons completed the Delphi study. The three commonest injuries reported by the surgeons at teach

joint were: bony mallet injuries, tendinous mallet injuries and dislocations at the DIP joint; palmar plate injuries, dorsal dislocations and dorsal fracture subluxations at the PIP joints; and base of proximal phalanx extra-articular fractures, metacarpal head/neck fractures and metacarpal shaft fractures at the MP joints. The responses of the surgeons largely matched the findings of the one-year review of the injuries except they expected many tendinous mallet injuries. It was not possible to validate the frequencies of the less common peri-articular injuries.

Conclusion: The study highlights the different patterns of peri-articular finger injuries at each of the three finger joints. It also highlights the frequency of dorsal impaction fractures of the PIP joint. The different patterns of injury are explained by the mechanism of falling and the local biomechanical forces.

A-0325 FROM CAST TO COMPOSITE - TREATMENT STRATEGIES FOR ACUTE PEDIATRIC MONTEGGIA FRACTURES

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Introduction: Monteggia fractures are rare but clinically significant injuries in pediatric trauma, requiring individualised management based on fracture type and reduction stability.

Aim: This case series presents four children with acute Monteggia lesions treated using fixation strategies tailored to age, fracture morphology, and intraoperative findings.

Material & Methods: Four pediatric patients (aged 5–9 years) with acute Monteggia injuries were treated at a regional pediatric trauma centre. Surgical decision-making was guided by Bado classification, fracture stability, and patient-specific anatomy. Fixation methods included closed reduction and casting, open reduction with mini dynamic compression (DC) plate osteosynthesis (Sanatmetal), and intramedullary stabilisation using a titanium elastic nail (Johnson & Johnson), and a resorbable PLGA nail (Activa IM Nail, Bioretec Ltd.). All procedures were performed under general anaesthesia with preoperative antibiotic prophylaxis. Patients were followed clinically and radiographically to assess union, reduction maintenance, and complications.

Results: All patients achieved radiographic union and maintained radial head alignment without re-dislocation. The resorbable nail provided adequate stabilisation in a 5-year-old with a Bado type I injury, with no implant-related complications. Another was treated with elastic stable intramedullary nailing (ESIN). One child with a fracture required plate fixation following failed closed reduction. Another case was successfully managed with reduction and casting alone. No infections, neurovascular complications, or reoperations were observed.

Conclusions: This series illustrates the importance of individualised fixation strategies in pediatric Monteggia fractures. Resorbable intramedullary nailing is a promising option in younger patients with unstable fractures, offering adequate stabilisation without the need for hardware removal. Further studies are warranted to validate its broader application.

A-0326 THE FIRST ANALYSIS OF A MULTICENTRE PAEDIATRIC SUPRACONDYLAR HUMERUS FRACTURE (SCHF) REGISTRY BY FRACTURE TYPE

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Introduction: Supracondylar humerus fractures (SCHFs) represent a significant segment of paediatric bone injuries, posing unique challenges due to their potential for severe complications.

Aim: This study aims to provide a detailed analysis of the surgically treated SCHF cases recorded in our registry.

Material & Methods: Prospectively collected data from seven institutes were retrospectively analysed using the Hungarian SCHF Registry, with data about surgically treated paediatric patients with SCHFs. We created three groups based on fracture type (Gartland IIA, IIB and III), and compared their preoperative, operative, and postoperative data. We analysed differences between the groups using the Chi-Squared test or Fisher's Exact test for categorical variables. The Kruskal-Wallis rank sum test was performed for continuous variables. If there was a significant difference between the groups, we conducted Dunn's post-hoc analysis.

Results: The fracture type was available for 214 patients (Gartland IIA group contained 31, IIB 121, and III 62 children). Our investigation highlighted notable patterns: lower oxygen saturation levels at initial assessment correlated with higher fracture severity ($p = 0.0125$); Body Mass Index (BMI) did not significantly influence the type of fracture ($p = 0.2254$); neither the mechanism of injury (flexion vs. extension) ($p = 0.5606$), nor the initial radial pulse ($p = 0.0647$) showed significant difference; the complexity of fractures was directly proportional to operative time ($p < 0.01$); less severe fractures required longer time to heal before pin removal ($p = 0.0125$); while severe fractures showed a tendency towards neurological complications, the overall complication rates did not vary significantly across different fracture types ($p = 0.0988$).

Conclusions: Our study emphasizes the significance of initial oxygen saturation levels as potential indicators of fracture severity. It also stresses the need for detailed attention to neurological complications and the prolonged use of pins, thereby highlighting the importance of customized treatment strategies in paediatric SCHFs.

A-0327 DETERMINATION OF THE LINEAR GROWTH OF THE LONG BONES OF THE LOWER ARM IN CHILDREN AND ADOLESCENT

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Introduction: There aren't many studies that concentrate on measuring the length of the bones in extremities in children. The main one is from 1955. This study enabled physicians to estimate normal bone length according to age and gender and project remaining growth for specific individuals, thus allowing to offer the optimal therapy for various pathologies.

Aim: Our retrospective analysis aims to refresh the data as we expect earlier growth spurts and larger and different final growth compared to the study from 1955.

Material & Methods: This study is a monocentric retrospective analysis of x-rays taken in a period of 10 years at the Emergency Department of the University Children's Hospital of Basel (UKBB), Switzerland. Only confirmed non-pathological

x-rays of standardised quality were accepted in the study. We measured radius and ulna digitally on anteroposterior or lateral views in the visible ossified length along the central axis of the bone and compared our results with those of Maresh using descriptive statistics and a p-value of ≤ 0.05 .

Results: We included 2127 x-rays. 853 (40.1%) were radii, 1274 (59.9%) were ulnae. They were divided into females (1031, 48.4%) and males (1096, 51.6%). We measured a statistically significant faster and earlier growth compared to the data from Maresh. The final length appear to be the same.

Conclusions: Children show a statistic significant earlier and faster growth when compared with the data from Maresh, but the final length of the bone seems to be similar. When trying to understand why we realised there are multiple reasons, both linked to our study and the original work of Maresh.

A-0328 CASTING MOTION TO MOBILIZE STIFFNESS TECHNIQUE TO REGAIN ACTIVE FLEXION AFTER REVISION SURGERY OF A FLEXOR TENDON REPAIR OF THE INDEX FINGER – A CASE REPORT

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Introduction: The use of the Casting Motion to Mobilize Stiffness (CMMS) technique by Judy Colditz is an appropriate technique to regain active flexion after revision of a flexor tendon repair. This technique uses the application of a plaster to immobilize proximal joints and allows repetitive active motion of distal joints and therefore increases tendon gliding without compromising the immobilization needed for healing or protection of the fixed tendon. Traditionally it is used to manage stiff hands but treatment options can be extended to cases with limited active motion when no lack of passive range of motion is present.

Purpose of the Study: The study's goal is to document the use of the CMMS technique as an effective method to treat a stuck tendon after flexor tendon repair.

Case Presentation: The patient initially suffered from a cut injury with a ruptured flexor digitorum profundus tendon in zone 2 of the index finger. The patient was treated with the Controlled Active Motion Protocol (CAM), but the tendon re-ruptured after 5 weeks. After revision surgery using a 4-strain repair, the patient was treated with the CAM protocol again. Due to limited active flexion of the index finger after 4 weeks post-surgery the CMMS protocol was initiated. Instead of a cast, a thermoplastic orthosis, adapted to allow some functional use in daily life of the treated hand, was adjusted and had to be worn at all times excluding active therapy. The orthosis was applied to the right hand (dominant) with the aim to increase tendon gliding and regain full active flexion of the index finger. The wrist as well as the MCP joint of the injured finger were immobilized in an extended position while allowing free flexion in the PIPJ and DIPJ. Additionally, to the partial immobilization with orthosis, the patient had therapy twice a week, where passive mobilization and scar tissue massage were performed.

Results: With this treatment, the initial flexion of 15° of the PIPJ was increased to 90° within 4 weeks and the patient regained full function of the index finger and a follow-up surgery could be prevented. After three months the patient could return to work as an electrician.

Discussion: Although an orthosis is more expensive than a cast and its application can be more difficult, applying the orthosis allowed performing therapy twice a week. Since its removable, a higher compliance is required. The partial immobilization of the wrist and MCP joint with the orthosis caused some functional losses for an extended period of two weeks. There was no difference in days to return to work using the CMMS protocol compared to the CAM protocol.

Conclusion: Using the CMMS technique is a relatively simple and cost-effective option to treat stuck tendons for compliant patients following flexor tendon repair to regain full function.

A-0329 FROM LESION TO RECOVERY: SURGICAL TREATMENT OF OSTEOCHONDRAL DISSECAN IN CHILDHOOD WITH 2-YEAR FOLLOW-UP RESULTS

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Introduction: Osteochondral dissecans (OCD) is a joint disorder characterized by the loss of vascular supply to a segment of subchondral bone and its overlying cartilage, leading to localized necrosis and instability. The condition most frequently involves the knee, elbow, and ankle, posing particular concern in the pediatric population due to potential disruption of joint growth and long-term function. Although its etiology remains multifactorial, repetitive microtrauma, genetic predisposition, and vascular compromise are considered key contributors. The apparent rise in incidence among children likely reflects improved imaging and diagnostic awareness.

Aim: To present two pediatric cases of capitellar OCD treated surgically with mosaicplasty and to report their 2-year follow-up outcomes.

Material & Methods: Case 1: A 15-year-old female rhythmic gymnast presented with a 6-month history of left elbow pain without a major trauma history. MRI revealed OCD of the capitulum humeri with a loose cartilage fragment. Surgical removal of the fragment and autologous mosaicplasty using a corticospongious graft harvested from the lateral femoral condyle were performed. Postoperative recovery was uneventful. Physiotherapy was initiated early, and MRI at 6-12 months confirmed graft incorporation. Full joint function was restored by 6 months, and at 2-year follow-up, the patient remained asymptomatic and fully active in sports.

Case 2: A 16-year-old male presented with recurrent left elbow pain persisting for several years. Imaging (X-ray, CT, MRI) confirmed OCD of the capitulum humeri. Through a dorsal approach, the necrotic osteochondral fragment was excised, and an autologous cartilage-covered spongiosa graft from the femoral condyle was implanted. The postoperative period was uneventful, and structured rehabilitation was initiated. At 2-year follow-up, the patient exhibited complete functional recovery and radiological healing.

Conclusions: Osteochondral dissecans of the elbow in pediatric patients remains a diagnostic and therapeutic challenge. Early recognition, precise imaging assessment, and timely surgical intervention are essential to achieve optimal outcomes. Mosaicplasty using autologous osteochondral grafts provides a reliable treatment option with excellent mid-term results. Postoperative rehabilitation and long-term follow-up are critical to ensuring full joint recovery and return to athletic activity.

A-0330 INVESTIGATION OF PREDICTIVE FACTORS FOR REDISPLACEMENT AFTER CLOSED REDUCTION OF DISTAL RADIUS FRACTURES USING CT-BASED MORPHOLOGICAL ANALYSIS

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Introduction: Most distal radius fractures (DRFs) are treated conservatively; however, some cases experience redisplacement during follow-up and require conversion to surgical treatment. Such treatment changes prolong the recovery period and increase medical costs, causing disadvantages for both patients and healthcare providers. Conversely, selecting surgical treatment based solely on Cooney's instability criteria from initial radiographs may lead to overtreatment. We

routinely evaluate post-reduction alignment using CT. This study aimed to identify predictive factors for redisplacement by combining CT-based morphological assessment with radiographic evaluation.

Material & Methods: We reviewed 40 patients (mean age, 72 years) with displaced DRFs treated by closed reduction between 2022 and 2024. Inclusion criteria after reduction were as follows: radial inclination (RI) $\geq 15^\circ$, palmar tilt (PT) $> -10^\circ$, ulnar variance (UV) ≤ 3 mm, and gap and step-off < 2 mm on radiographs. Patients were divided into two groups according to maintenance of these parameters for 4 weeks: the non-redisplacement group (15 cases) and the redisplacement group (25 cases). We compared clinical background, radiographic findings, and CT morphological parameters, including cortical bone contact, presence of comminution, and bone defect volume between the two groups.

Results: There were no significant differences in age, dominant hand, mechanism of injury, radiographic parameters at injury and immediately after reduction, or presence of ulnar fracture between the two groups. No significant differences were also found in CT-evaluated cortical bone restoration, comminution, or bone defect volume. Among the changes in RI, PT, and UV between immediately after reduction and approximately 1 week later, only PT change was significantly greater in the redisplacement group ($p = 0.0424$). The area under the ROC curve (AUC) was 0.703, with a cutoff value of 4.4° (sensitivity 0.73, specificity 0.64).

Discussion: CT findings immediately after reduction could not predict redisplacement, whereas early change in PT within 1 week was the only significant predictor. Monitoring early PT changes may allow earlier identification of patients at high risk for redisplacement. These findings suggest that sequential radiographic evaluation provides more meaningful information than a single post-reduction assessment for early detection of redisplacement.

A-0331 DIAGNOSTIC ACCURACY OF PHYSICAL EXAMINATION FOR DETECTING RADIOLOGICALLY OCCULT SCAPHOID FRACTURES: A RETROSPECTIVE ANALYSIS OF > 2000 CASES

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Introduction: scaphoid fractures remain a diagnostic challenge even for experienced clinicians. Within the UK there is heterogeneity of assessment and management. recent national guidelines such as the national institute for clinical excellence (NICE) and Royal College of Emergency Medicine (RCEM) have made some recommendations

Aim: evaluate the diagnostic accuracy of 5 commonly used clinical tests, or combination of, for the detection of radiologically occult scaphoid fractures.

Material & Methods: Retrospective analysis of a case cohort of 2100 cases using logistic regression and ROC curves to look at diagnostic accuracy

Results: pending data analysis this week

Conclusions: Interim data suggests ASB alone is the most clinically accurate test for assessment. Scaphoid tubercle gives similar results and the widely used 2 of 3 ASB, tubercle and telescoping is not supportive in our large cohort (all data to be clarified this week)

A-0332 HOOK OF HAMATE FRACTURES ASSOCIATED WITH CARPOMETACARPAL FRACTURE-DISLOCATIONS: CASE SERIES AND LITERATURE REVIEW

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Aim: To describe the epidemiological, clinical, radiological, and functional data of patients operated on for hook of hamate fractures associated with carpometacarpal (CMC) fracture-dislocations between 2014 and 2023.

Material & Methods: Retrospective review of patients with CMC fracture-dislocations associated with hamate fractures.

Exclusion criteria: underage patients, CMC fracture-dislocations without hamate fracture, or absence of informed consent.

Two independent observers collected data on: Epidemiology, mechanism of injury, treatment, and complications (from clinical records and current examination). Pre- and postoperative imaging (X-ray and/or CT). Functional outcomes (PRWE and MHQ questionnaires). Descriptive analysis using means, percentages, and cross tables. No statistical testing was performed. Results were compared with published series.

Results: 11 patients, all male; mean age 30 years (range 16–47). 100% manual laborers; all returned to work. 9 injuries on the dominant (right) hand. Mechanism: 7 falls from height, 4 punching trauma. Mean delay diagnosis–surgery: 54 days (range 5–380). Mean follow-up: 4.5 months (range 1–7). Fracture type (Cain & Ebraheim): 6 type 2, 3 type 3, 2 type 1B. Hamate fracture associated with 7 cases of 4th–5th metacarpal base fracture-dislocation. 8 cases treated with open reduction and internal fixation (screws for hamate, K-wires for metacarpals; 7 dorsal, 1 volar approach). K-wire removal at 47 days (range 25–47). Mean pain score (VAS) 1 (range 0 to 2). Flexion–extension: 63°/66° (vs. 71°/69° in uninjured hand). Grip strength: 39 kg (vs. 45 kg). Full finger motion in all patients. PRWE: 7.2, MHQ: 32.15. Complications: one Kirschner wire removal due to intolerance, one hamate fracture collapse. Radiological union achieved in all cases. CMC arthropathy observed in five cases. Anatomical reduction in seven cases, and three cases showed 0 to 25 percent joint subluxation.

Conclusions: Hamate body fractures are frequently associated with fracture-dislocations of the fourth and/or fifth metacarpal bases. In this series, such injuries were more common in young male patients, involving high-energy mechanisms and the dominant hand. With early diagnosis, surgical treatment allows for satisfactory anatomical and functional recovery, as well as return to work. The results of this series are consistent with those reported in the literature.

A-0333 A COMPARISON OF TWO SURGICAL FIXATION METHODS FOR HIGH-GRADE ACROMIOCLAVICULAR JOINT DISLOCATIONS: A RETROSPECTIVE COHORT STUDY

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Introduction: Acromioclavicular (AC) joint dislocation is a relatively common injury in the general population, accounting for approximately 9%-12% of all shoulder injuries. Significant controversy persists regarding the optimal surgical fixation method for high-grade injuries (Rockwood type ≥III) to maximize functional outcomes and minimize recurrence.

Aim: We aimed to compare the outcomes of two surgical techniques for high-grade AC joint dislocations: anatomic ligament reconstruction with a semitendinosus autograft alone versus the same reconstruction augmented with a suture button (TightRope) system.

Material & Methods: We conducted a retrospective comparative study of patients treated for high-grade AC joint dislocations at our tertiary orthopedic center between 2017 and 2024. Group A underwent reconstruction with a semitendinosus autograft only. Group B received the autograft reconstruction augmented with a coracoclavicular suture button system. Functional evaluation included the Simple Shoulder Test, qDASH, and VAS scores. Radiographic stability was assessed by measuring the coracoclavicular distance to detect any loss of reduction.

Results: A total of 21 male patients (mean age: 33.4 years; minimum 1-year follow-up) were included: 12 in Group A and 9 in Group B. At the final follow-up, there was no statistically significant difference between the groups in functional outcomes (Simple Shoulder, qDASH, and VAS scores). However, patients in Group B demonstrated a significantly faster recovery and return to sports rate. Furthermore, Group B showed significantly less loss of reduction, maintaining a more anatomic coracoclavicular distance at one year. No major complications were recorded in either group.

Conclusions: While both techniques provide excellent final functional outcomes, augmenting an anatomic ligament reconstruction with a suture button system offers the distinct advantages of accelerated rehabilitation and superior radiographic stability. This combined technique presents a superior alternative for high-demand patients and athletes, providing a more durable repair without an increased complication rate.

A-0334 EVOLUTION OF HAND SURGERY OVER FOUR DECADES: EXPERIENCE FROM THE PULVERTAFT HAND CENTRE

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Introduction: Demand for hand surgery in Europe continues to rise. In 2015/16, hand injuries accounted for 4.6 million (20%) emergency department attendances across the UK. European elective activity has also increased, driven by an ageing population and a higher prevalence of diabetes. Most hand conditions now require management within dedicated specialist units. The Pulvertaft Hand Centre is an internationally recognised provider of both trauma and elective hand surgery.

Aim: To analyse temporal trends in trauma and elective hand procedures over a 40-year period.

Material & Methods: We performed a retrospective review of prospectively recorded case notes at a specialist tertiary hand centre. Data were collected for trauma and elective hand procedures for two weeks per year from 1985 to 2024. Data were divided into five year intervals. Data were not available from 2020–2022 due to the COVID-19 pandemic. We analysed trends in patient demographics, acuity, date of surgery and procedure details. Procedures were classified as trauma or elective with sub-categorisation based on procedure type. Subgroup analyses of Dupuytren's and carpometacarpal joint (CMCJ) procedures were also performed.

Results: A total of 3851 procedures were recorded. The majority of procedures were elective (n=2767; 72%) compared with trauma (n=1084; 28%). Mean patient age increased by ~11 years (elective, 56.5 years old; trauma, 42.3 years old) over the study period. Trauma and elective activity grew across all five-year intervals with the exception of 2020–2024. Total number of trauma procedures substantially increased (n=8 [1985–1989]; n=103 [2020–2024]) with the highest volume of procedures (n=305) reported in 2015–2019. There was a shift toward complex reconstructive and microsurgical procedures with nerve, vessel, and tendon repairs (n=339) representing the highest trauma procedure volume.

Total number of elective procedures also increased (n=121 [1985–1989]; n=158 [2020–2024]) with the highest volume of procedures (n=578) reported in 2010–2014. Similarly, microsurgical operations were most frequent with nerve procedures (n=891) accounting for the largest elective procedure volume. Dupuytren's (n=351) and CMCJ (n=149) procedures substantially increased. Fasciectomy (n=216) was the primary treatment for Dupuytren's throughout. Use of aponeurotomy (n=110) markedly increased from 2000–2004, coinciding with its wider international adoption in

the early 2000s. Collagenase injection was used (n=11) between 2005 and 2014. Thereby, reflecting its introduction and later withdrawal in the UK. Trapeziectomy (n=109) was the mainstay of treatment for CMCJ arthritis throughout followed by fusion (n=14).

Conclusions: In conclusion, the volume and complexity of hand surgery has risen greatly. Increasing service demand coincides with an older patient population and a shift toward more complex reconstructive and microsurgical procedures. Our findings should prompt reflection and discussion on how best to meet the evolving challenges of hand surgery in the 21st century.

A-0335 THE PERIPHERAL “NERVE LOOP” – END-TO-END NEURORRHAPHY COMPARED TO CONVENTIONAL TREATMENT METHODS FOR PAINFUL PERIPHERAL NERVE NEUROMAS

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Introduction: Scientific background: Various methods have been described for the treatment of painful neuromas in peripheral nerves, which are often not sufficiently effective. An as-yet insufficiently tested approach consists of resection of the neuroma with subsequent end-to-end neurorrhaphy of the proximal nerve stump to a neighbouring nerve branch, resulting in a peripheral “nerve loop”.

Aim: The objective is to evaluate pain reduction following this approach and compare outcomes to standard methods.

Material & Methods: A retrospective analysis of patients who underwent surgery due to chronic neuropathic pain caused by peripheral nerve neuromas with numeric rating scale (NRS) ≥ 6 between 1st January 2018 and 31st March 2024 was performed. Patients who underwent neuroma resection with subsequent end-to-end neurorrhaphy are considered the study group, while those who were treated with another technique, including intramuscular, intravenous, intraosseous or subcutaneous transposition of the proximal nerve stump, acts as control. The pain, according to NRS, at least 1-year post surgery and other important patient data, are collected. Furthermore, we will evaluate postoperative ultrasound images obtained at least one year after end-to-end neurorrhaphy.

Results: The study group (n=18) consists of 39% women and 61% men ($\bar{O}$ 48,61 [26-78] years), while the control group (n=17) comprises 35% women and 65% men ($\bar{O}$ 44,65 [20-62] years). In the study group, 56% of the affected nerves were located in the upper and 44% in the lower extremity; in the control group 53% and 47%, respectively. Preoperatively, the NRS was $\bar{O}$ 8 (6-10) in the study and $\bar{O}$ 7.71 (6-10) in the control group. Post-surgery, the NRS declined to 2.39 (0–9) after 30 (12–67) months in the study group and to 5.29 (0–8) after 49 (12–79) months in the control group. Consequently, This resulted in a significant reduction of 5.61 compared to 2.41 ($P < 0,001$). In the subgroup analysis, the loop technique was also significantly superior to intramuscular displacement (N=11, NRS $\bar{O}$ from 7.81 to 5.18; $\Delta = 2.63$) ($P < 0,001$).

Conclusions: Despite the small sample size, the formation of a peripheral “nerve loop”, via end-to-end neurorrhaphy, appears to be an effective treatment option for patients suffering from traumatic neuromas of peripheral nerves.

A-0336 FAILURE OF A SCAPHO-METACARPAL ARTHROPLASTY WITH THE DUOMOBILITY PROSTHESIS (TOUCH®, KERI MEDICAL) FOLLOWING PROXIMALISATION OF THE THUMB DUE TO PREVIOUS RESECTION ARTHROPLASTY

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Introduction: Case report on a biomechanical disorder in the mid carpal joint of a scapho-metacarpal prosthesis (Touch®, KERI-Medical) following proximalisation of the thumb as a result of a previous resection arthroplasty of the CMC-1 joint and pre-existing habitual bilateral mid-carpal instability.

Aim: Highlighting the risks and limitations of scaphometacarpal use of a duomobility prosthesis.

Material & Methods: In 2022, the patient underwent external a CMC1 resection arthroplasty with partial resection of the proximal trapezium at stage 3 of OA (Eaton/Littler). Over the following 14 months, the patient developed painful proximalisation of the first metacarpal bone. In 2023, external revision surgery was performed with implantation of a duomobility prosthesis (Touch®, Keri Medical) in a scapometacarpal way. After implantation, the patient immediately complained of disturbances in thumb extension and flexion, including a snapping phenomenon depending on the position of the wrist, as well as persistent pain in the first ray.

Clinical examination revealed a marked displacement of the midcarpal joint, with the contralateral side showing lesser signs of midcarpal instability. A typical 'clunk' phenomenon was not observed on either side. Wrist movement was not restricted E/F 70-0-80, U/R 30-0-20. The MCP ROM of the thumb was E/F 40-0-50, IP ROM E/F 30-0-60. The Kapandji index was 10, depending on the position of the wrist.

The X-ray and CT scan showed dorsal rotation of the entire proximal row and dorsal subluxation of the capitate bone with no signs of osteoarthritis radiocarpal or mediocarpal.

Fluoroscopy revealed a snapping phenomenon of the first carpal row. Due to painful wrist movement and reduced grip strength, the patient was unable to work as a chemical laboratory assistant.

Results: Twelve weeks after the initial consultation, revision surgery was performed with explantation of the prosthesis and implantation of rib cartilage, followed by temporary transfixation of the scapho-capitate joint for six weeks.

The final examination took place 11 months after the operation. The range of motion of the wrist was E/F 70-0-70°, U/R 30-0-20. The Kanpandji index was 10. Mobility in the thumb IP and MCP joints was unchanged. A return to work was possible. X-rays showed no signs of carpal collapse.

Conclusions: CMC arthroplasty using a dual-mobility prosthesis may be an option for proximalisation after resection arthroplasty of the first CMC joint, but should be carefully considered. In cases of preoperative instability of the metacarpal bone, this procedure may lead to unacceptable impairment of wrist and thumb mobility.

A-0337 POSTOPERATIVE MANAGEMENT OF PEDIATRIC FLEXOR TENDON INJURIES. A CRITICAL REVIEW OF REHABILITATION PROTOCOLS AND PROPOSAL OF AGE-APPROPRIATE HAND THERAPY TREATMENT GUIDELINES

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Introduction: Pediatric flexor tendon injuries (FTIs), most frequently resulting from traumatic lacerations to the volar hand, pose a significant threat to long-term hand function. Optimal rehabilitation strategies remain debated, ranging from immobilization to early passive or active mobilization, with limited evidence addressing anatomical, physiological, and psychosocial considerations in this population.

Aim: This critical review aimed to synthesize and evaluate the effectiveness of post-operative rehabilitation protocols following FTIs and to propose an evidence-based and age-appropriate framework for clinical practice concerning all pediatric population (0-17 years old).

Material & Methods: A structured critical review approach was applied, guided by established methodologies. Eight electronic databases (MEDLINE, Embase, CINAHL, Scopus, Cochrane Library, Web of Science, PEDro, and Google Scholar) were searched and selected for their broad coverage of biomedical and rehabilitation literature. A PICO framework (Population: children/adolescents 0–17 years; Intervention: post-operative rehabilitation after flexor tendon repair; Comparison: immobilization, early passive or early active mobilization; Outcomes: functional recovery and compliance) guided keyword selection. Eleven studies met inclusion criteria and were critically appraised using ROBINS-I tool. Findings were thematically synthesized to compare protocols and highlight age- and compliance-related considerations.

Results: Eleven studies were included, reporting on immobilization, early passive mobilization (EPM), and early active mobilization (EAM) protocols. Across protocols, functional outcomes were generally good to excellent. In very young children (≤ 5 years), immobilization was more frequently applied due to small tendon size and limited cooperation, while in older or more cooperative children (> 5 years) both EPM and EAM yielded superior motion and functional recovery when supported by family engagement. Complication rates were low, though evidence was heterogeneous and mainly retrospective. Variability in outcome measures and follow-up periods limited direct comparison, yet overall findings support the high recovery potential of pediatric patients when age-specific and compliance factors are considered.

Conclusions: The findings highlight the necessity of tailoring rehabilitation protocols to developmental stage and psychosocial context. While immobilization is preferable in very young children, mobilization may be safely and effectively implemented in older, cooperative patients. Although functional recovery was generally high, small samples, retrospective designs, and variable outcomes restrict generalizability. These limitations underline the need for high-quality comparative studies, especially in children aged 5–10 years, to refine protocol selection. This review underscores the importance of individualized, age-specific rehabilitation strategies for pediatric FTIs. Locally, such approaches may improve outcomes and reduce complications, while nationally they offer a framework to inform evidence-based guidelines and optimize pediatric hand therapy practice.

A-0338 NERVE TRANSFER IN SPASTIC UPPER LIMB: A CASE SERIES

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Introduction: Nerve transfer (NT) is a well-established surgical technique commonly used to restore function in paralyzed muscles following brachial plexus and peripheral nerve injuries, as well as in patients with tetraplegia. The supinator nerve is the most frequently used donor in tetraplegia, serving as an excellent motor source for either the posterior interosseous nerve (PIN) to restore finger extension or the anterior interosseous nerve (AIN) to restore finger flexion. To date, no published reports have described the use of NT in patients with upper limb spasticity. Therefore, we aim to share our experience and present the outcomes of NT applied in this specific patient group.

Aim: To present preliminary results of nerve transfer in patients with upper limb spasticity and to evaluate its potential as a method for functional reconstruction in this condition.

Material and Methods: This case series included 15 patients in whom motor nerve transfer constituted one component of the surgical treatment. In 13 cases, the supinator nerve was used as the donor, while in 2 cases, another branch of

the radial nerve was selected. In 11 cases, an end-to-end, and in 4 cases, an end-to-side neurorrhaphy technique was applied. The follow-up period ranged from 1 to 4.5 years.

Results: Postoperative outcomes will be illustrated through representative videos demonstrating functional recovery after nerve transfer in the spastic upper limb. In addition, we will present the postoperative routines applied in our practice, which we believe may contribute to achieving more consistent and durable outcomes. Examples of successful and challenging cases will be discussed to highlight factors influencing muscle recovery and donor nerve selection.

Conclusion: Our experience indicates that in selected cases of upper limb spasticity, nerve transfer is a justified surgical option that can contribute to the correction of deformities and, in some cases, to functional improvement of the limb. Further studies are needed to better define the patient selection criteria for this type of procedure.

A-0340 FUNCTIONAL AND PATIENT REPORTED OUTCOMES AFTER CORRECTIVE OSTEOTOMY OF THE DISTAL RADIUS WITH OR WITHOUT BONE GRAFTING: RESULTS OF A RANDOMIZED MULTICENTER STUDY

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Introduction: Open wedge osteotomy with bone grafting from the iliac crest is considered the standard treatment for malunions of the distal radius. However, small retrospective studies suggest that bone grafting may not always be necessary when performing open wedge correction osteotomy of the distal radius.

Aim: The purpose of this study is to compare both treatment options by analyzing postoperative functional and patient reported outcomes in a multicenter prospective randomized trial.

Material & Methods: In this randomized multicenter study, patients aged 18 years or older with a symptomatic extra-articular malunion of the distal radius who were scheduled for corrective osteotomy were included in this study. They were randomized into two groups: one group received bone graft from the iliac crest, the other group underwent corrective osteotomy without bone grafting. The follow-up period was one year and included 5 measurement points. The active range of motion, as objective functional outcome, was measured with a goniometer. Patient reported outcomes were evaluated using the DASH, PRWHE and VAS questionnaires. A total of 66 patients were included in this study.

Results: After one year of follow-up, there were no significant differences in range of motion in both groups. No significant differences were observed in DASH, PRWHE and VAS scores. All patients showed significant improvement in their functional and patient reported outcomes after surgery.

Conclusions: Both treatment options showed a significant improvement in functional and patient reported outcomes after correction osteotomy of the distal radius for symptomatic malunion. Based on these results, no superior treatment modality can be identified. However, since bone grafting involves an additional procedure with potential complications, correction osteotomy without the use of bonegraft might be preferred.

A-0341 DIETRICH'S DISEASE: A RARE LESION OF THE METACARPAL HEAD

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Introduction: Osteonecrosis of the metacarpal head, known as Dietrich's disease, is a rare entity with few cases reported in the literature. It has been associated with systemic lupus erythematosus, corticosteroid use, and trauma, although

most cases are idiopathic. The condition predominantly affects young males, and diagnosis is usually made by exclusion. Aim: With this presentation we aim to highlight a case of Dietrich's disease in which the chosen surgical approach successfully resolved both the osteonecrosis and the patient's symptoms.

Material & Methods: We report the case of a healthy 13-year-old female presenting with pain during active motion and at rest in the 4th metacarpophalangeal joint of the right hand, with several months of evolution. Physical examination revealed preserved range of motion without effusion, but with pain on movement. MRI showed palmar cortico-medullary collapse and bone marrow edema of the 4th metacarpal head, suggestive of osteonecrosis. Curettage with excision of necrotic bone and filling with an autograft from the ipsilateral distal radius was performed.

Results: Postoperatively, pain during joint motion decreased significantly, with radiographic evidence of consolidation. At 6-month follow-up, MRI demonstrated remission of osteonecrosis and full graft integration, with correction of the deformity. The QuickDASH score was 4.5. At 1-year follow-up, the patient was asymptomatic, with full range of motion and complete graft incorporation.

Conclusions: The pathophysiology of Dietrich's disease remains poorly understood. The vascularization of the metacarpal head relies on small pericapsular vessels whose disruption may lead to necrosis. It typically presents as chronic pain in the dominant hand of young patients. Radiographs may show subchondral collapse and articular incongruity, while MRI confirms the diagnosis through low T1/T2 signal intensity, bone marrow edema, and joint effusion. Due to the rarity of this condition, there is no consensus on optimal treatment. We present a surgical technique that achieved complete clinical and radiological resolution in this case.

A-0342 BONE HEALING AND RADIOGRAPHIC OUTCOMES AFTER CORRECTIVE OSTEOTOMY OF THE DISTAL RADIUS WITH OR WITHOUT BONE GRAFTING: RESULTS OF A RANDOMIZED MULTICENTER STUDY

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Introduction: The standard management of distal radius malunions traditionally involved open wedge osteotomy with an iliac crest bone graft. However, evidence from small retrospective studies indicates that bone grafting may not be necessary when performing open wedge correction osteotomy of the distal radius.

Aim: The aim of this study is to compare both treatment options by analyzing time to complete bone healing and performing radiographic morphometric analysis of the distal radius after correction osteotomy.

Material & Methods: We conducted a prospective randomized multicenter study including patients aged 18 years or older with an extra-articular symptomatic malunion of the distal radius scheduled for corrective osteotomy. Participants were randomly assigned to one of two groups: One group received bone graft from the ipsilateral iliac crest, while the other underwent corrective osteotomy without any bone grafting. The follow-up period lasted one year and included 5 follow-up moments. At each follow-up moment, X-rays and multiplanar high resolution CT scans were obtained. All radiographs and CT scans were independently evaluated by two assessors. Radiographic parameters concerning the morphometric analysis were measured on X-ray images, while bone healing and osteotomy gap size were assessed on high resolution multiplanar CT scans. Bone healing was considered complete when the osteotomy gap was fully bridged by bone formation. A total of 66 patients were included in this study.

Results: After one year of follow-up, no significant differences were observed between the two groups concerning various radiographic parameters. Complete bone healing occurred after an average of 179 days in the bone graft group and 219 days in the group without bone grafting ($P = 0.36$). No significant differences in bone defect size were found between the two groups.

Conclusions: Based on these findings, neither treatment can be considered superior, although bone grafting requires an additional procedure with potential complications. Therefore, based on radiographic morphometric analysis and bone healing assessment, correction osteotomy without the use of bonegraft might be preferred.

A-0343 FAKERY OR FUNCTIONAL: A PILOT STUDY EXPLORING THE PATIENT EXPERIENCE OF CUSTOM SILVER RING SPLINTS IN THE UK

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Introduction: Since September 2024, UK based specialist hand therapists have been trained by We Design Silver Splints from the Netherlands to assess for, measure and fit custom silver splints. In all other European countries where the splints are available, the cost fully or partially funded by the state. The UK is the first country where the patient is fully self-funding. This enhances the need for the splints to be both functional and cost effective. Silver splints provide an alternative to custom-made or off-the-shelf splints aiming to support joints and balance biomechanics to enhance function. Silver is smooth on the skin, adjustable, antimicrobial and antibacterial. It is also durable enough for functional use and is recyclable. Most of all, however, the splints are beautiful and often mistaken for jewellery.

Aim: To explore patient experience of the first 130 patients to be fitted with silver splints in the UK

Material & Methods: A questionnaire was electronically sent to all patients who had silver splints made and fitted for them since the inception of this service in September 2024. Pathologies included osteoarthritis, rheumatoid arthritis and hypermobility spectrum disorder. The questions used were based on previous research carried out by Roux et al (2021). However, a section on value for money was added to the questions about changes in pain and function. Themes were explored from qualitative responses. Quantitative data was compared to that published by Roux et al.

Results: The results surveyed subjective changes in overall pain and endurance during hand function with and without the splints. These changes include specific hand functions such as writing, buttoning clothes and holding a book. Value for money is also explored.

Conclusions: Silver splints make a positive alternative to custom-made and off the shelf splints

A-0344 COMPLICATIONS, QUALITY OF LIFE AND COSTS EFFECTIVENESS AFTER CORRECTIVE OSTEOTOMY OF THE DISTAL RADIUS WITH OR WITHOUT BONE GRAFTING: FINAL RESULTS OF A RANDOMIZED MULTICENTER STUDY

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Introduction: Open wedge osteotomy using an iliac crest bone graft is traditionally regarded as the standard treatment for distal radius malunions. Nevertheless, several small retrospective studies indicate that bone grafting may not be required when performing open wedge correction osteotomy of the distal radius.

Aim: The purpose of this study is to compare both treatment options by analyzing the complication rate, quality of life and cost-effectiveness of corrective osteotomy of the distal radius.

Material & Methods: Patients aged 18 years or older with an extra-articular symptomatic malunion of the distal radius who were eligible for corrective osteotomy were included in this prospective randomized multicenter study. Patients were randomized into two groups: one group received a bone graft from the iliac crest, while the other underwent

osteotomy without bone grafting. The follow-up period lasted one year and comprised five scheduled assessment points. Complications and quality of life were the primary study outcomes. Complications were categorized into two groups: those at the site of the operated radius and those at the iliac crest. The number and severity of complications were documented. Quality of life was assessed using the EuroQol-5D-5L questionnaire. Cost-effectiveness was the secondary study outcome and was calculated as the costs per QALY (Quality-Adjusted Life Year).

Results: No significant differences were observed in complications at the site of the operated radius. Two patients in the bone graft group experienced complications from the iliac crest bone graft harvesting procedure: chronic pain and hypesthesia of the surgical site. Quality of life at one year did not differ significantly between the groups. However, at two and six weeks postoperatively, patients with bone grafting experienced significantly more mobility problems. The patients without bone grafting had a significantly higher QALY (0.80 vs. 0.68) and significantly lower total treatment costs (€7,839 vs. €10,302).

Conclusions: Based on these results, corrective osteotomy without the use of bone graft from the ipsilateral iliac crest is the preferred treatment when considering quality of life, morbidity and cost-effectiveness. This approach reduces cost, results in a higher QALY and avoids complications associated with harvesting bone from the iliac crest.

A-0345 RESTORING BALANCE TO THE PARALYSED SHOULDER AFTER TRAUMATIC INJURY TO THE SUPRACLAVICULAR BRACHIAL PLEXUS: OUTCOMES OF NERVE TRANSFER AND GRAFTING

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Introduction: Restoration of shoulder function is often an objective after traumatic brachial plexus injury. Selection of the most appropriate technique and knowledge of the likely outcome is important.

Aim: This study reviews outcomes and complications of reconstruction for shoulder paralysis, including accessory to suprascapular nerve transfer, after traumatic supraclavicular brachial plexus injury.

Material & Methods: Patients who underwent accessory to suprascapular transfer from 2001 to 2023 were identified from the prospective service database. Data included age, injury mechanism, surgery delay, extent of brachial plexus injury, and type of axillary nerve reconstruction (C5 nerve grafts or transfer of medial head of triceps branch). Accessory to suprascapular nerve transfers were carried out via an anterior approach after exploration of the supraclavicular plexus preserving innervation of the upper trapezius. When possible, the axillary nerve was repaired separately with nerve grafts from C5 or transfer of the medial head triceps branch of the radial nerve through a posterior approach. Evaluation included MRC muscle grading, range of active shoulder abduction against gravity, and range of active external rotation. Results: There were 46 patients, mean age 31 years (range 14–67), 41 men and 5 women. Road accidents caused 40 injuries. The mean surgery delay was 96 days (median 80, range 11–414). Eighteen patients had C5–6 injuries, 11 C5–7, eight C5–8, and nine C5–T1 injuries. Axillary nerve repair was performed in 36 cases: 20 with C5 grafts, 14 with triceps nerve transfers, and two with intercostal nerves. Follow-up (mean 36 months, range 14–111) was available for 41 patients. Median active shoulder abduction was 80° (range 30–180) with 23 patients $\geq$ 80°. Median external rotation was 0° (range –40 to 70) with 25 able to rotate to neutral or beyond.

No patients over the age of 40 years achieved more than 90° shoulder abduction. Median abduction for patients who had nerve grafts for the axillary nerve was 90° (30–180), 70° (range 30–160) for triceps nerve transfers, and 50° (30–90) for those with no repair ($p = 0.04$). Shoulder abduction decreased with increasing extent of the initial injury, 110° for C5–6, 80° for C5–7, 80° for C5–8, and 40° for C5–T1 ($p = 0.006$). Abduction was also affected by long thoracic nerve function,

median 90° for cases with good serratus anterior power and 50° in those without ($p = 0.004$). There were no clear trends with regard to the range of shoulder external rotation. Four patients with strong deltoid recovery had scapular instability due to lower trapezius weakness after accessory nerve transfer.

Conclusions: Accessory to suprascapular nerve transfer with axillary nerve reconstruction can provide satisfactory shoulder abduction, but outcomes are affected by age, the axillary nerve repair, severity of the initial injury, and long thoracic nerve function. External rotation is less predictable. Despite the trend towards nerve transfers, nerve grafts should be considered for the axillary nerve if the C5 root is viable. It is important to be aware of the risk of scapular instability after accessory nerve transfer, which may limit function.

A-0347 ERYTHROPOIETIN EFFECTS IN NERVE INJURY: IMPLICATIONS FOR PREOPERATIVE USE

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Introduction: The resolution of traumatic debris is under appreciated in the surgical management of traumatic peripheral nerve injury (TPNI). Debris must be cleared via phagocytosis by surviving Schwann cells (SCs) before macrophages arrive. This requires changes in cell behavior, that is later reversed over weeks after nerve injury during rehabilitation for re-myelination and axon regeneration. Delays in this transition impair functional recovery. Erythropoietin (EPO, FDA-approved for anemia) improves TPNI recovery by enhancing debris clearance post-TPNI, but EPO's effects on earlier SC phagocytosis and reparative transition are unclear. We hypothesized that EPO's neuro- and myelo-regenerative effects on SCs may underpin EPO's early functional improvements by accelerating phagocytosis and axonal regeneration post-TPNI. **Aim:** To reveal the effects of EPO in standard models of TPNI

Material & Methods: Wild-type (C57BL/6J) mice (10 weeks, $25 \pm 3g$) underwent IACUC-approved sciatic nerve crush injury (SNCI). Mice ($n=6/group$) were grouped into sham, SNCI (saline control), and SNCI+EPO (5000 IU/kg), with the treatment given i.p. immediately post SNCI and at 24 and 48h. The sciatic functional index (SFI) was measured on days 1, 3, 5, and 7, with random mice euthanized on post-injury days 3 and 7 to analyze SC phagocytosis, apoptosis, and repair-phenotype by immunofluorescence (IF). In-vitro phagocytosis of dead-SC and SC repair function under lipopolysaccharide (LPS)-induced stress conditions was analyzed using IF and Western blot.

Results: EPO significantly altered SC repair (p75NTR vs. MPZ and Ki67 vs. SOX10 expression) and phagocytosis of myelin debris on days 3 and 7 post-SNCI. EPO significantly improved SFI on post-injury day 7 via anti-apoptotic effects demonstrable on days 3 and 7 post-SNCI. In-vitro, EPO treatment sped phagocytosis of dead SCs and differentiation of SCs (c-JUN and p75NTR vs. MPZ, SOX10, EGR2) to repair SCs when challenged with LPS.

Conclusions: This is the first work demonstrating EPO augmenting SC reparative and phagocytic functions, along with improved axonal regeneration, re-myelination, and overall functional SFI recovery. We now know how EPO is working in nerve injury and can discuss clear methods of managing our surgical patients with adjuvant EPO.

A-0348 THE BEST VENUE FOR CLINICAL TRIALS ON NON-SEVERING NERVE INJURY TREATMENTS

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Introduction: Nerve injury trials of adjuvant treatments suffer from the diverse spectrum of injuries in patients presenting to trauma centers. This is even more problematic with trials of treatments for crush, burn or other non-severing nerve injuries. The diversity of injuries impairs recruitment because no two injuries are alike enough to equally allocate sufficient numbers of cases to different treatment groups.

Aim: Discuss alternative clinical trial models that allow testing of treatments in easy to allocate groups.

Material & Methods: Our group has gained approval for several trials with a candidate treatment, 4-aminopyridine (4-AP), for regenerative effects we have identified and published in wound healing, burn healing, and nerve injury. For nerve injury trials, we chose to pursue initial pilot studies in prostatectomy patients with urologists because of the ubiquity of similarly injured nerves.

Results: Our recent publication of an active trial protocol reveals the logic of pursuing nerve injury trials in prostatectomy patients. These patients have similar injuries associated with removing the prostate cancer. Furthermore, these patients are followed with standardized outcomes measures used as primary outcomes measures. Such measures are low-cost, reproducible, and have internal validity as direct outcomes associated with nerve recovery.

Conclusions: Initial pilot trials in prostatectomy patients for traumatic peripheral nerve injury treatments are reasonable to consider for new treatments that require feasible trial data for further advancement.

A-0349 NERVE INJURY RECOVERY AGENTS SUPPORT RECOVERY IN MULTIPLE OTHER TISSUES

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Introduction: 4-aminopyridine (4-AP) has proven effective in regenerative models of nerve injury. This propelled investigation in wound healing, burn healing, and bone healing models. The data from these models has helped us gain approval for human clinical trials in all three of these human correlates.

Aim: Describe the underlying data that supports 4-AP trials in wound, burn and fracture healing and allow others to participate or conduct critical human pilot trial work in this already-approved drug that has a favorable side-effect profile.

Material & Methods: Animal studies were conducted following the approved protocols of the Institutional Animal Care and Use Committee at The University of Arizona, Tucson, AZ, and Penn State University, Hershey, PA. C57BL/6J male mice (10 weeks; 20-25g) following midshaft tibial fracture, or dual wound, or single full thickness burns were assigned to 4-AP (1.6 mg/kg/day, IP) and saline (0.1 ml/mouse/day, IP) treatment groups. Bones, Appropriate tissue was harvested at healing (day 21) for histomorphological analysis. 4-AP's effect on human-hBMSCs, keratinocytes, hOBs was tested using cell viability, migration, collagen deposition, matrix mineralization, and bone-forming gene/ protein expression analysis. All results were presented as the mean $\pm$ SEM, and the P-value of 0.05 was considered statistically significant.

Results: 4-AP showed overall average improvements in wound, burn and bone healing in excess of 25% for each injury model. 4-AP significantly enhanced the gene or protein expression of BMP2, and osteoinductive markers of RUNX2, OSX, BSP, OCN, and OPN in hBMSCs and hOBs. Similar findings were evident in skin with keratinocyte markers (K10, K14, K15, K17) as well as markers of fibroblast function. All cells showed enhanced migration, collagen deposition, and matrix mineralization with 4-AP treatment versus control. In-vivo, mid-shaft tibial fractures demonstrated significantly improved

bone healing (enhanced BMD, BV/TV, trabecular number, and trabecular thickness) with 21 days of 4-AP treatment. Finally, 4-AP significantly enhanced the expression of BMP2 itself inside of healing fractures.

Conclusions: We have three related models that have been sufficient to justify trial approvals in the United States for 4-AP treatment. These models all share an intimate dependency on nerve injury for healing in human injuries. We believe this evidence is suggestive that regenerative nerve injury treatments may show promise in multiple tissues that are often concomitantly injured with nerves in human trauma.

A-0350 DISTAL RADIOULNAR JOINT INSTABILITY: ANATOMY OF TFC TEARS

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Introduction: The development of dry arthroscopic examination of the distal radioulnar joint (DRUJ) has changed our understanding of the anatomy of triangular fibrocartilage (TFC) tears.

Aim: This presentation aims to improve the understanding of the anatomy and prevalence of TFC tears associated with DRUJ instability.

Material & Methods: A retrospective audit was conducted on all patients with symptomatic DRUJ instability who underwent dry arthroscopy of the wrist and DRUJ performed by the primary author over a 12-month period. Patients who did not have a tear of the TFC identified at arthroscopy or who exhibited signs of ulnocarpal impaction were excluded from the study. A description of the anatomy of the TFC tear and the result of the hook test was documented for all patients.

Results: A TFC tear was identified in 107 patients. All patients had a peripheral tear of the TFC. A partial tear of the foveal ligament was identified in 7% of patients and a complete tear of the foveal ligament in 4.5% of patients. Complex tears of the TFC, including a horizontal shear tear, a 'floating' foveal ligament, and a volar tear that extended into the lunotriquetral joint, were also identified.

Conclusions: Dry arthroscopy of the RCJ and DRUJ is necessary to accurately evaluate the integrity of the foveal ligament. This study revealed that all tears of the TFC associated with DRUJ instability have a peripheral component and with increasing severity the tear extends between the floor of the ECU sheath and the foveal ligament. In the most severe expression of the injury, the foveal ligament is damaged and rarely is the foveal ligament completely torn. The ability to define the anatomy of the TFC tear will enable surgeons to perform anatomically specific repairs.

A-0351 COMPARISON OF CLINICAL OUTCOMES BETWEEN VOLAR PLATE FIXATION AND EXTERNAL FIXATION FOR DORSAL FRACTURE DISLOCATIONS OF THE PIP JOINT

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Introduction: Dorsal fracture dislocations of the proximal interphalangeal (PIP) joint remain challenging to treat, and the optimal surgical strategy is still debated.

Aim: This study aimed to compare the clinical and radiographic outcomes of volar plate fixation (VPF) and dynamic external fixation (DEF) for PIP joint dorsal fracture dislocations.

Material & Methods: This retrospective multicenter study compared outcomes of external fixation used for PIP joint dorsal fracture dislocations at six institutions between January 2015 and January 2024. Forty-five patients met the inclusionary criteria, of which 21 underwent VPF and 24 underwent DEF. The primary outcomes were differences in PIP and DIP joint range of motion (ROM) at 1 and 6 months postoperatively. Secondary outcomes included radiographic evaluation immediately after surgery and at the final follow-up.

Results: There were no significant differences in demographics or fracture patterns between groups. At 1 month, the median flexion angle was significantly greater in the VPF group (80°, range 25–95°) compared with the DEF group (60.0°, range 45.0–90°) ($p = 0.04$). At 6 months, the median extension angle was significantly less in the VPF group (–10.0°, range –40–0°) compared with the DEF group (–5.0°, range –44–20°) ($p = 0.04$). The significance level was adjusted using the Benjamini-Hochberg method. At the follow-up, there were no significant differences between the two groups in postoperative subluxation of the PIP joint and articular reduction. However, the odds ratio for articular reduction was 4.33 (VPF: 3 [14.3%] vs. DEF: 11 [45.8%], $p = 0.08$, 95% CI: 0.96–19.6).

Conclusions: VPF may permit earlier initiation of postoperative ROM training, explaining superior flexion at 1 month. Conversely, palmar exposure and volar implant placement may limit final extension compared with DEF. Direct visualization of the fracture site in VPF may promote better articular congruity, potentially reducing the long-term risk of degenerative changes. Although ROM was superior in the DEF group, VPF achieved better articular congruity. Further studies with larger sample sizes and longer follow-up are required to validate these findings.

A-0352 HOOK TEST–NEGATIVE FOVEAL TFCC TEARS: A CASE SERIES AND CLINICAL IMPLICATIONS

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Introduction: Foveal detachment of the triangular fibrocartilage complex (TFCC) may be missed on clinical examination, MRI, or even standard radiocarpal arthroscopy. Although the hook test is widely accepted as highly sensitive for foveal tears, recent reports suggest that isolated foveal detachment can exist despite a negative hook test.

Aim: To describe a case series of hook test–negative but foveal tear–positive TFCC lesions and highlight the diagnostic and clinical implications.

Material & Methods: Three consecutive patients with persistent ulnar-sided wrist pain refractory to conservative management were retrospectively reviewed. All underwent radiocarpal arthroscopy showing negative trampoline and hook tests. Subsequent distal radioulnar joint (DRUJ) arthroscopy revealed isolated foveal detachment or mucoid degeneration at the foveal footprint. Arthroscopic transosseous TFCC repair was performed in all cases.

Results: All three patients demonstrated clear foveal pathology under DRUJ arthroscopy despite negative hook tests. After arthroscopic transosseous repair, pain and function improved in all cases. Mean DASH and PRWE scores improved by more than 40%, and all regained near full wrist motion at final follow-up.

Conclusions: A negative hook test during radiocarpal arthroscopy does not exclude a foveal TFCC tear. When clinical suspicion persists despite negative imaging or arthroscopic findings, DRUJ arthroscopy is essential for accurate diagnosis and appropriate repair.

A-0353 EVALUATION FOR EACH QUESTION IN DASH AFTER DISTAL RADIUS FRACTURE SURGERY

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Aim: Score for each question in DASH (Disability/Symptom) from patients underwent surgery for distal radius fracture was evaluated to derive standard postoperative patient profile.

Material & Methods: The mean score for each question in DASH answered by patients underwent surgery for distal radius fracture was calculated. The scores for the highest 8 questions and the lowest 2 questions from 30 questions were statistically tested.

Results: This study included 62 cases (12 males, 50 females) with a mean age of 65.3 years. The mean interval between surgery and DASH assessment was 136 days. The mean DASH score was 8.9. The mean scores for all questions ranged from 1.06 to 1.98. The highest-scoring questions were, in order: #1 (Opening tight jars: 1.98), #18 (Recreational activities involving impact: 1.75), #24 (Arm, shoulder or hand pain: 1.72), #11 (Carrying 5 kg or more: 1.69), #19 (Recreational activities in which you move your arm freely: 1.65), #25 (Arm, shoulder or hand pain when you performed any specific activity: 1.63), #28 (Stiffness in your arm, shoulder or hand: 1.52) and #8 (Garden or do yard work: 1.51). The lowest-scoring questions were #3 (Turning a key: 1.06) and #29 (Difficulty falling asleep due to pain: 1.08). Statistically significant differences were found between the scores of the top three or four questions and the bottom two questions ($p < 0.05$, ANOVA, Turkey-Kramer test). **Conclusions:** Summarizing the results, at the average 4.5-month post-operative assessment for distal radius fracture, patients' subjective evaluations suggested mild residual pain, slightly insufficient muscle strength, and mild impairment in impact-related recreational activities. Conversely, little impairment was suggested for turning a key, and little pain enough to cause sleep disturbance was present.

A-0354 PLATE FIXATION FOR SCAPHOID NON-UNION IN THE ADOLESCENT: A SENSIBLE OPTION? AND CAN 3D PRINTING HELP IN THE PROCESS?

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Introduction: Scaphoid fractures are rare, especially in children. Often this heals well after conservative treatment, but sometimes a non-union occurs. There are several treatments for a non-union in the scaphoid, including plate fixation. However, this is rarely done in children. This is because the scaphoid is still growing. A CT scan can be made in advance, of which a 3D print can be made. 3D printing makes it possible to accurately measure the size of the scaphoid, and thereby the possibility to use the scaphoid plate.

Aim: **Material & Methods:** **Results:** This report presents three cases where this was successfully done.

Conclusions: Plate fixation of the scaphoid bone can be a valid option to be used to treat non-union in children

A-0355 REVISION WRIST ARTHROPLASTY VERSUS WRIST ARTHRODESIS AFTER FAILED TOTAL WRIST ARTHROPLASTY: A SYSTEMATIC REVIEW

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Introduction: Management options after failed total wrist arthroplasty include revision arthroplasty and salvage arthrodesis. Choice of procedure remains debated, with limited comparative evidence. We systematically reviewed outcomes following revision arthroplasty versus arthrodesis after failed total wrist arthroplasty.

Aim: To compare clinical effectiveness and complications of revision wrist arthroplasty versus wrist arthrodesis performed for failed total wrist arthroplasty.

Material & Methods: This systematic review followed PRISMA guidance. From database searches, 3,723 records were identified; 638 duplicates were removed and 3,085 records were screened. Fifteen full texts were assessed, and three studies met inclusion. Twelve full texts were excluded with predefined reasons. No ongoing studies were identified. Data were extracted on reoperation or survival, union status, pain, function, range of motion, and complications. Owing to heterogeneity in study design, indications, and implant eras, a meta-analysis was not appropriate and findings were synthesised qualitatively.

Results: Three studies (1997 to 2018) reported outcomes in small cohorts after failed total wrist arthroplasty. One retrospective cohort of 16 revision wrist arthroplasties in patients with rheumatoid arthritis reported a 5 year cumulative implant survival of 74 percent; four wrists required further surgery (re-revision or conversion to arthrodesis). Patient-reported outcomes improved at one year (Patient-Rated Wrist Evaluation and Canadian Occupational Performance Measure), with maintenance or partial attenuation at five years; pain at rest was minimal and pain with activity decreased. Range of motion and grip strength were preserved relative to preoperative values.

A comparative series of failed biaxial total wrist arthroplasties evaluated three strategies: revision arthroplasty (n=5), arthrodesis (n=3), and excision arthroplasty (n=2). Mean Hospital for Special Surgery scores were 73 for revision, 63 for arthrodesis, and 92 for excision; activities of daily living scores were 16, 14, and 20, respectively. All three fusions united; one revised wrist showed loosening and was listed for fusion. Short term outcomes suggested that revision arthroplasty was not inferior to fusion and preserved motion, which patients valued.

A single centre series of wrist arthrodesis after failed implants (12 patients, 13 procedures) reported 7 solid fusions and 5 painless pseudarthroses. Eleven of twelve results were excellent or good, with predictable pain relief and stability, but there were 17 complications among 9 patients. Authors recommended more rigid fixation to reduce distal pseudarthrosis.

Conclusions: After failed total wrist arthroplasty, revision arthroplasty can preserve motion with meaningful early improvements but carries a non-trivial risk of further surgery within five years. Arthrodesis offers reliable pain relief and stability, with variable radiographic union yet high rates of satisfactory clinical outcomes at the cost of wrist motion and with notable complication burdens. Given small, heterogeneous cohorts and historical implants, high quality comparative studies with contemporary designs are needed to refine procedure selection.

A-0356 SYMPTOMATIC PLATE REMOVAL RATE ACCORDING TO THE PLATE LOCATION AND CONFIGURATION AFTER ULNAR SHORTENING OSTEOTOMY

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Introduction: Ulnar shortening osteotomy (USO) is a common and effective surgical procedure for the treatment of ulnar impaction syndrome. Despite its proven efficacy, a clinical concern remains the occurrence of postoperative plate-related complication, which frequently requires subsequent hardware removal.

Aim: This study aimed to retrospectively evaluate the influence of the plate location (dorsal, ulnar, or volar) on the ulna and the plate configuration on the symptomatic hardware removal after ulnar shortening osteotomy.

Material & Methods: A total of 170 patients who underwent USO procedures between 2016 and 2025 were retrospectively analyzed. Within this cohort, 37 patients (21.7%) underwent symptomatic hardware removal. Measured radiographic variables included plate location (dorsal, ulnar, or volar aspect) on the ulna and the distance from the ulnar styloid tip to the distal edge of the plate. Plate configurations were classified as ulnar osteotomy plates and conventional 3.5-mm LC-DCPs. Statistical analysis consisted of the Chi-square test to compare hardware removal rates based on plate location and multivariable logistic regression to identify independent predictors according to plate configuration.

Results: The overall rate of symptomatic hardware removal was 21.8% (37 of 170 patients). The removal rates based on plate location were 19.4% (dorsal aspect), 20.0% (ulnar aspect), and 28.9% (volar aspect). Plate location was not significantly associated with the overall symptomatic hardware removal rate ($P = 0.47$).

However, plate configuration was statistically significant predictor. The use of USO plate was a significant protective factor against symptomatic hardware removal risk (OR, 0.31; $P = 0.026$) when compared to the conventional LC-DCP.

In the USO plate group, removal rates according to the location were 11.5% (dorsal aspect), 19.3% (ulnar aspect), and 30.6% (volar aspect). The plate location showed no statistical significance with the symptomatic removal rate. ($P = 0.09$).

However, the distance from the ulnar styloid tip was found to be a significant predictor of hardware removal risk in the USO plate group ($P = 0.03$), where plates placed distally led to higher plate removal rates. The optimal cutoff distance from the ulnar styloid tip to the distal edge of the plate was calculated as 37.0 mm increasing risk in the USO plate group.

Conclusions: Plate configuration was a significant protective factor against symptomatic hardware removal after USO, whereas plate location showed no significant association in either the overall cohort or the USO plate group ($P > 0.05$).

The dorsal surface of the distal ulna provides a relatively flat cortical surface suitable for plate application compared with the ulnar or volar surfaces. Plates positioned distally within 37 mm from the ulnar styloid tip were associated with higher symptomatic hardware removal rates ($P = 0.03$). Proximal dorsal application of a low-profile USO plate is recommended to reduce symptomatic hardware removal and simplify the operative procedure.

A-0357 BIOMECHANICAL EVALUATION OF THE WRIST AFTER ARTHROSCOPIC TRANSOSSEOUS TRIANGULAR FIBROCARTILAGE COMPLEX FOVEAL REPAIR USING BIODEX SYSTEM 4 ISOKINETIC DYNAMOMETER

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Introduction: Triangular fibrocartilage complex (TFCC) foveal tears can lead to distal radioulnar joint (DRUJ) instability and functional impairment. Arthroscopic transosseous foveal repair is an established surgical treatment, yet few studies have

defined which biomechanical parameters objectively reflect recovery. Postoperative wrist function is usually evaluated by patient-reported outcome measures such as the Mayo Wrist Score and Quick DASH, but these scores vary according to patient perception. The recovery of forearm rotational muscle strength after TFCC foveal repair has not been thoroughly investigated.

Aim: This study aimed to determine whether isokinetic biomechanical parameters significantly improve after arthroscopic transosseous TFCC repair and to assess their correlations with established clinical outcomes. Furthermore, preoperative comparisons between the affected and contralateral wrists were performed to identify specific biomechanical deficits associated with TFCC injury, clarifying which parameters are most compromised before surgery and how they recover postoperatively.

Material & Methods: A total of 52 patients who underwent arthroscopic transosseous TFCC repair for distal radioulnar joint instability were retrospectively analyzed. Pre and postoperative isokinetic evaluations were performed using a Biodex System 4 Dynamometer, measuring body weight–normalized peak torque (PT), total work (TW), time to peak torque (TPT), and acceleration time (AT) during pronation and supination. Grip and pinch strength, wrist range of motion, Visual Analog Scale, Mayo Wrist Score, and Quick DASH scores were also assessed. Functional recovery was defined as a Quick DASH improvement of ≥ 12 points, consistent with the reported minimal clinically important difference (MCID). Statistical analyses were performed using a paired t test for pre and postoperative or side to side comparisons and Pearson correlation analysis to identify relationships between biomechanical parameters and clinical outcomes.

Results: Before evaluating postoperative recovery, preoperative paired comparisons confirmed that TFCC injury was associated with side-specific deficits. The involved side demonstrated significantly lower PT and TW compared with the contralateral side ($p < 0.001$). At 1 year postoperatively, significant improvements were observed in clinical outcomes, including the Visual Analog Scale, Mayo Wrist Score, and Quick DASH (all $p < 0.001$). Isokinetic performance in both pronation and supination improved significantly, with increases in PT, TW, and decreases in AT ($p < 0.05$). However, TPT showed no significant change. In wrist kinematics, flexion and extension strength increased significantly ($p < 0.001$), whereas grip and pinch strength did not show significant improvement. Finally, pronation PT and TW demonstrated the strongest positive correlations with clinical recovery, defined as a ≥ 12 -point decrease in the Quick DASH score.

Conclusions: TFCC foveal tears result in compromised forearm rotational strength and endurance secondary to biomechanical disruption of DRUJ stability and impaired load transfer across the wrist. These functional deficits were effectively restored following arthroscopic transosseous foveal repair, which reestablishes DRUJ stability and optimizes force transmission during forearm rotation. Restoration of pronation PT and TW are key biomechanical markers for meaningful wrist recovery. Biodex dynamometry enables continuous and quantitative monitoring of wrist recovery, and may help refine rehabilitation and determine safe return-to-sport timing after TFCC repair.

A-0359 ARTHROSCOPIC ARTHROPLASTY TECHNIQUE USING MINI–TIGHTROPE FOR THE THUMB CARPOMETACARPAL (TCM) JOINT WITH SEVERE DORSAL SUBLUXATION

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Introduction: Since 2015, we have performed arthroscopic partial trapeziectomy combined with ligament reconstruction using the mini–TightRope (mini-TR) system for thumb carpometacarpal (TCM) osteoarthritis. Many operative cases demonstrated dorsal subluxation of the TCM joint, even when classified as Eaton stage II. In addition, a steep angle between the metacarpal axis and the articular surface on lateral radiographs often caused restricted abduction and

extension of the thumb, even after conventional trapezial resection. Some cases also showed metacarpophalangeal (MP) hyperextension or persistent MP joint pain. In others, dorsal subluxation progressed postoperatively.

Materials and Methods: Since 2020, we have modified our approach by resecting mainly the dorsal aspect of the trapezium to make the resection plane nearly perpendicular to the metacarpal bone axis. We also aggressively remove beak osteophytes and scar tissue on the ulnar side to facilitate reduction of dorsal subluxation. When reduction was stable, the mini-TR was fixed laterally, centered on the thumb metacarpal. In cases with residual subluxation, fixation was placed slightly dorsally, and the index metacarpal anchor was positioned one-third dorsally.

We retrospectively compared patients who underwent this modified technique from 2020 onward (Group A) with those treated using the conventional method between 2015 and 2019 (Group B). All cases had at least six months of postoperative follow-up. Outcomes were evaluated using the Visual Analog Scale (VAS) for pain, thumb palmar abduction angle, pulp pinch strength, and radiographic assessment of dorsal subluxation.

Results: In Group A, VAS improved from 72.3 to 20.1 ($p < 0.05$) with an average recovery time of 4.5 months. In Group B, VAS improved from 74.5 to 16.0 ($p < 0.001$) with an average of 3.8 months, showing slightly faster pain relief. The thumb palmar abduction angle increased to 110% of preoperative levels in Group A and 125% in Group B. Pulp pinch strength improved from 2.8 kg to 3.6 kg in Group A, and from 2.5 kg to 4.2 kg in Group B. Radiographically, dorsal subluxation progressed by an average of 1.8 mm in Group A and 0.8 mm in Group B compared with immediately after surgery.

Conclusions: Most patients undergoing arthroscopic surgery for thumb TCM joint osteoarthritis exhibit dorsal subluxation. In severe cases, MP hyperextension and temporary postoperative MP joint pain may occur, even after partial trapeziectomy. However, this modified arthroscopic technique—focusing on dorsal trapezial resection and improved alignment relative to the metacarpal axis—shortened recovery time for range of motion, reduced postoperative pain, and minimized progression of dorsal subluxation. Further refinement and longer follow-up are needed to confirm the long-term stability of this method.

A-0360 3D-PLANNED PATIENT-SPECIFIC OSTEOTOMIES FOR SUBCAPITAL METACARPAL MALUNION: RADIOLOGICAL AND CLINICAL OUTCOMES

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Introduction: Subcapital malunions of the metacarpal can lead to pain, reduced grip strength, and aesthetic deformity. Conventional free-hand corrective osteotomies rely on intraoperative visual estimation and may be imprecise, especially in multiplanar deformities. Three-dimensional (3D) planning with patient-specific instrumentation (PSI) enables accurate transfer of the digital plan to the operative field and has shown promising results in distal radius and phalangeal malunions. **Aim:** The aim of this study was to evaluate the feasibility, safety, and early clinical outcomes of 3D-planned, PSI-guided corrective osteotomies for subcapital metacarpal malunions.

Material & Methods: Eight consecutive male patients (nine metacarpals) who underwent 3D-planned PSI-guided corrective osteotomy between 2013 and 2024 were retrospectively reviewed. All patients presented with symptomatic post-traumatic subcapital deformity of the metacarpal. Preoperative planning was performed using bilateral computed tomography. The contralateral metacarpal was mirrored and registered to the affected side by an Iterative Closest Point algorithm to quantify deformity and define the correction. Virtual osteotomies were simulated in CASPA planning software, and patient-specific cutting and reposition guides were 3D-printed. Clinical follow-up included assessment of range of motion (ROM), grip strength (Jamar dynamometer, normalized to the contralateral side), and patient-reported satisfaction using

the Single Assessment Numeric Evaluation (SANE) Score. Radiologic accuracy analysis was based on postoperative CT imaging using 3D surface registration to quantify residual rotational and translational deviations.

Results: The mean age was 37 years (range: 24–53), with a mean interval of 19 ± 10.3 months from injury to corrective surgery. Pain was the predominant preoperative symptom, reported by all patients (100%, $n=8$), while four patients (50%) additionally presented with reduced hand function. No intra- or postoperative complications occurred. Autologous bone grafts were used in seven procedures (78%). Quantitative assessment of correction accuracy (in depth radiologic data analysis pending) demonstrated close alignment between planned and achieved fragment positions. No non-unions or loss of correction were observed. At a mean follow-up of 11.3 ± 6.7 months, the active ROM of the metacarpophalangeal joint improved from $83 \pm 19^\circ$ preoperatively to $84 \pm 18^\circ$ postoperatively, while grip strength increased from 32 ± 17 kg to 41 ± 17 kg. Mean improvement in paired cases showed $+9.5$ kg. Implant removal was performed before last follow-up in seven metacarpals (78%) for hardware irritation or limited tendon gliding, occasionally combined with tenoarthrolysis. At last follow-up, five patients (62.5%) were pain-free, two reported occasional pain, and one reported persistent discomfort. All patients ($n=4$) with preoperative impairment regained full hand function in daily and occupational activities.

Conclusions: 3D-planned PSI-guided corrective osteotomy of subcapital metacarpal malunion is feasible, safe, and allows accurate restoration of bone alignment and good functional recovery. The workflow enables a reliable transfer of the virtual plan to the operative field even in small bone segments. Despite the need for meticulous preoperative planning, the technique offers high precision and reproducibility and may represent a valuable addition to the surgical management of complex malunions of subcapital metacarpal fractures.

A-0361 HIGH-RESOLUTION ULTRASOUND-GUIDED DIAGNOSIS AND SEGMENTAL RECONSTRUCTION FOR MULTIFOCAL PERIPHERAL NERVE TORSION : A CASE SERIES

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Introduction: Multifocal torsion of a peripheral nerve is extremely uncommon, particularly involving the posterior or anterior interosseous nerve. Multiple torsion points within a single nerve are associated with poor prognosis for spontaneous recovery and require individualized surgical management to achieve optimal outcomes. The diagnostic accuracy of high-resolution ultrasound in identifying the number and location of torsion sites has important implications for surgical planning.

Aim: This study aimed to evaluate, through a case series, the usefulness of high-resolution ultrasound in identifying multifocal nerve torsion sites preoperatively, and to report surgical outcomes based on intraoperative nerve status.

Material & Methods: Five patients with multifocal torsion of the posterior ($n=4$) or anterior interosseous nerve ($n=1$) were diagnosed by high-resolution ultrasound and confirmed intraoperatively. Two to four separate torsion points were present per patient, spanning 1–6 cm intervals. When the intervening segments showed swelling or fibrosis, segmental resection and autologous lateral antebrachial cutaneous nerve (LABCN) grafting were performed. Where direct repair was possible, selective derotation was used. Postoperative motor recovery was evaluated by the Medical Research Council (MRC) grading system, with serial clinical and neurophysiological follow-up. Histological analysis was performed on resected segments.

Results: Preoperative ultrasound precisely identified all torsion sites, allowing targeted surgical exposure and decision-making. Tension-free multi-segment reconstruction with LABCN graft resulted in consistent motor recovery ($\geq$ M3 in

all patients, $\geq$ M4 in three) within 6–9 months. Histopathology demonstrated fibrosis and mucoid degeneration in excised nerve segments, confirming irreversible structural damage. No recurrent torsion or secondary neuroma formation occurred at 1-year follow-up.

Conclusions: High-resolution ultrasound is a reliable modality for localizing and characterizing multifocal nerve torsion, thus optimizing surgical approach and outcomes. Segmental resection with autologous nerve grafting was performed when the segments between torsion sites exhibited irreversible pathological changes. Early surgical intervention is recommended when multifocal nerve torsion is confirmed by ultrasound to avoid progression to irreversible neuropathology and to optimize motor recovery.

A-0363 INVESTIGATION OF THE EFFECTS OF BILATERAL NEUROMOBILIZATION IN PATIENTS WITH CARPAL TUNNEL SYNDROME: A COMPARISON STUDY WITH UNILATERAL APPLICATION

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Introduction: Neuromobilization exercises using the gliding technique increase the mobility of the median nerve relative to surrounding tissues, thereby effectively reducing symptoms of carpal tunnel syndrome (CTS). Considering the continuity of the connective tissue sheaths surrounding the central and peripheral nervous system, it is hypothesized that bilateral application of neuromobilization exercises may be more effective than unilateral application in improving clinical outcomes.

Aim: The aim of this study was to investigate the effects of bilateral gliding exercises of the median nerve in patients with unilateral severe CTS and to compare the results with those of patients who performed the exercises unilaterally.

Material & Methods: A single-center, double-blinded randomized controlled trial was conducted with 28 patients with unilateral severe CTS (Bland grade $\geq$ 4). Patients were randomized into bilateral (BIL, n=14) and unilateral (UNI, n=14) groups. A treatment program including massage, nerve gliding exercises for the median nerve, and cold application to the median nerve trace and dermatome was applied twice a week for 4 weeks. The same program was also prescribed as a home program. UNI group performed the gliding exercises only on the symptomatic side while BIL group did on both sides. Pain level (using Visual Analog Scale (VAS)), grip strength (using hydraulic dynamometer), bipod, tripod, and lateral pinch strength (using pinchmeter), and light touch and pressure sensation (using Semmes-Weinstein monofilaments) were assessed before and after treatment. Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) and its subscale scores (symptom severity (BCTQ-SSS) and functional status (BCTQ-FSS)) were also administered. Both within-group and between-group results were compared.

Results: Neuromobilization exercises reduced activity and night pain, improved gross grip strength, BCTQ-SSS and BCTQ-FSS subscores in both groups ($p<0.05$). Additionally, the BIL group showed significant improvement in bipod pinch strength and light touch sensation ($p<0.05$). When the level of improvement with treatment was compared, the reduction in activity pain and symptom severity in the BIL group was greater than the UNI group ($p<0.05$).

Conclusions: The results of this study showed that neuromobilization exercises using the gliding technique would provide greater benefits when applied to both extremities compared to unilateral application in patients with severe CTS, thereby enhancing improvements in pain and symptom severity. It is recommended that including gliding exercises for the nonsymptomatic side would be beneficial even in severe grade disease.

A-0365 COMPARATIVE CASE SERIES OF SURGICAL FIXATION METHODS FOR TRAUMATIC RADIOCARPAL DISLOCATION: A FOCUS ON BRIDGE PLATING

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Introduction: Radiocarpal dislocation (RCD) is a rare, high-energy injury often associated with poor outcomes. External fixation and K-wire fixation remain standard, yet are limited by pin site infection, malalignment, and patient discomfort. Dorsal spanning (bridge) plating has recently been introduced as a stable alternative with fewer complications and is increasingly reported in systematic reviews and case series.

Aim: **Material & Methods:** We retrospectively reviewed 6 male RCD patients (mean age 47 years) treated at a Level 1 Trauma Center between July 2020 and October 2023, all operated on by a single surgeon, with an average follow-up of 10 months. Patients were managed with bridge plating (n=2), external fixation followed by internal fixation (n=3), or K-wire with plate fixation (n=1). Outcomes included ROM, VAS, Mayo score, QuickDASH, radiographic alignment, and complications. **Results:** All patients achieved stable reduction and union. Bridge plating yielded mean (VAS 1.5, QuickDASH 19.4, and Mayo 75), comparable to external fixation (VAS 1.67, QuickDASH 18.2, Mayo 80) and K-wire fixation (VAS 2, QuickDASH 15.9, Mayo 70). Despite the limited number of cases, our bridge plating results were comparable with previously reported outcomes. Regarding range of motion, most patients recovered 50–74% of the contralateral side, while two cases treated with bridge plating achieved 75–99% of normal ROM. No major complications occurred, and bridge plating avoided the pin-site issues can occur in external fixation.

Conclusions: Bridge plating provided functional outcomes at least equivalent to external fixation and K-wire fixation, with added benefits of stable internal fixation, greater comfort, and reduced infection risk. Considering that Mayo scores above 70 are generally classified as good, our results compare favorably with published series and align with recent reviews suggesting bridge plating as a safe, effective, and increasingly accepted strategy for RCD. Larger prospective studies are warranted to validate these findings.

A-0366 CLINICAL MANAGEMENT OF PERIPROSTHETIC CARPOMETACARPAL JOINT INFECTIONS: A EUROPEAN DELPHI CONSENSUS

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Introduction: Periprosthetic joint infections (PJIs) of the first carpometacarpal (CMC-1) joint of the thumb are rare but challenging complications of arthroplasty. Currently, no hand-specific guidelines exist.

Aim: This study aimed to develop an expert consensus on the management of PJI following CMC-1 arthroplasty using the Delphi method. The consensus integrates existing evidence from infections of larger joints (e.g., knee and hip) to address the current knowledge gap.

Methods: A structured Delphi process was conducted with seven representative experts in hand surgery, specifically in the field of CMC-1 arthroplasty, from across Europe. Participants completed three iterative survey rounds to achieve consensus on diagnostic and therapeutic strategies. Recommendations were based on established guidelines for PJI of larger joints and were supplemented by expert opinion.

Results: Consensus was reached on key aspects of diagnosis and treatment. The expert panel unanimously recommended

revision surgery in all suspected cases, with particular support for debridement, antibiotics, and implant retention with exchange of the prosthetic neck (DAIR) in acute infections. In chronic cases, trapeziectomy was advised as a salvage procedure. A six-week antibiotic regimen following revision surgery, preferably transitioning from intravenous to oral administration, was strongly endorsed. Empirical antibiotic therapy with amoxicillin/clavulanic acid or clindamycin received moderate agreement. The use of antiseptic irrigation solutions and more aggressive surgical revisions achieved only limited consensus. An interval of 12 weeks between corticosteroid injection and surgery was recommended.

Conclusion: This Delphi consensus represents the first structured clinical guideline for the management of PJI following CMC-1 arthroplasty. The recommendations align with established principles from large-joint infection management but are specifically adapted to the anatomical and clinical characteristics of the hand. The results emphasize the importance of individualized, evidence-based treatment strategies that consider the anatomical and functional complexity of the thumb. Together, these statements provide a practical framework for clinical decision-making and may serve as a foundation for future hand joint-specific infection management protocols.

A-0367 THE „BANK FINGER,, PRINCIPLE IN HAND SURGERY – PERSONAL EXPERIENCE

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Introduction: Given the devastating nature of mutilating hand injuries, reconstructive surgeons have progressively embraced the concept of “spare parts” surgery. „Bank finger” principle involves using non salvageable or amputated segments as a tissue bank, providing bone, tendon, skin, nerves, vessels or even joints to reconstruct adjacent defects.

Aim: This study highlights the effectiveness of „bank finger,, technique and the possibilities of reconstruction, from personal experience.

Material & Methods: A retrospective observational study was conducted within the Department of Plastic, Reconstructive, and Hand Surgery of “Sf. Spiridon” Emergency County Hospital, Iași, Romania, including cases managed between January 2017 and June 2024. A total of 35 adult patients presenting with mutilating hand injuries or partial amputations in which a bank finger technique was employed for reconstruction were included in the present analysis. Within the study cohort, were analyzed the etiology of trauma, patient de-mographics (sex and age), pattern and extent of injury, surgical techniques applied, and the type and segment of the bank finger utilized, together with the corresponding functional outcomes. Postoperative outcomes were assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) score, the Visual Analogue Scale (VAS) for pain, and the Michigan Hand Outcomes Questionnaire (MHQ) to evaluate both functional recovery and patient satisfaction. Additional evaluation criteria included sensitivity recovery (Semmes–Weinstein monofilament test) and range of motion (TAM – Total Active Motion), where applicable.

Results: From a total of 35 adult patients who sustained complex traumatic injuries of the hand, there were 27 men and 8 women, with a mean age of 38.2 ± 9.6 years and a range 21–62. The dominant hand was affected in 63% of cases. The most frequent mechanisms of trauma were industrial/machinery injuries (37%) and circular-saw accidents (29%), followed by crush or avulsion injuries (20%) and domestic accidents (9%). A total of 74 digits were involved (mean 2.1 per hand), with the thumb (26%) and middle finger (23%) being the most frequently reconstructed. The bank finger was utilized to provide tissues for direct reconstruction in all cases, most commonly as cutaneous or osteo-cutaneous fillet flaps (57%), followed by tendon or vascular grafts (28%) and nerve transfers (9%). The tissues reconstructed at the

recipient finger and correspondingly harvested from the donor (bank) finger included: skin in 19 cases, tendon in 10 cases, artery in 9 cases, nerve in 7 cases, joint in 2 cases, bone in 4 cases, and a phalangeal column (digital transposition) in 1 case. Medicinal leech therapy was employed in 8 cases for the management of venous congestion following the use of local or loco-regional flaps. Mean functional outcomes demonstrated excellent recovery: DASH 14.6 ± 6.2 , MHQ 82.5 ± 9.3 , and VAS 1.8 ± 1.1 .

Conclusions: The "bank finger" principle represents a cornerstone of the philosophy of reconstructive surgery - one that prioritizes tissue preservation, functional restoration, and anatomical harmony, transforming non-recoverable structures into vital components of functional recovery.

A-0369 OPTIMIZING INTER-OBSERVER AGREEMENT IN FINGER RANGE OF MOTION ASSESSMENT USING A LINEAR MIXED-EFFECTS MODEL

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Introduction: Previous studies assessing inter-observer reliability of finger range of motion (ROM) have commonly treated individual finger measurements as independent observations. Because finger ROMs within a hand are correlated, modeling them as independent observations underestimated standard error and may inflate the agreement coefficient. Aim: The purpose of this study was to assess inter-observer reliability of finger range of motion (ROM) by using a mixed-effects regression model (MRM) that accounts for the clustered nature of the data. We hypothesized that MRM will yield a more reliable agreement coefficient.

Material & Methods: A total of 47 patients with a mean age of 53 years (SD 15.19) were included in this cross-sectional study; 28 (59.6%) were women. Twenty-five of the measured hands were right hands (53.19%). A total of 39 patients presented hand pathology, in whom the total range of motion (TAM) of the finger was limited.

Two independent observers measured the TAM of the fingers in each participant. Agreement between observers was first evaluated using classical methods, including the intraclass correlation coefficient (ICC) and Lin's concordance correlation coefficient (CCC), calculated for each finger. To account for the hierarchical data structure—fingers nested within individuals and repeated by observers (assuming order effect)—a mixed-crossed-effects restricted maximum likelihood (REML) regression model was then applied with TAM as fixed-effect and Subject(Id), Finger and Observer (Obs) as random-effects. Both unadjusted and adjusted models (including age, sex, and presence of pathology) were fitted to estimate variance components and the overall ICC.

Results: An excellent level of agreement was observed between the two observers. Classical analyses demonstrated ICC values ranging from 0.884 to 0.975 and CCC values from 0.788 to 0.950, indicating strong reproducibility (Table 1). Consistent findings were obtained from mixed-effects REML modelling, which yielded an overall ICC of approximately 0.973. Observer A tended to record slightly lower TAM values than the reference observer B ($\beta = -2.07$, $p = 0.076$), although this difference was not statistically significant. Adjustment for age, sex, and pathology did not modify the results. Conclusions: MRM has been used to estimate reliability in clinical trial data with repeated measurements and for measuring the size of the stent in cardiovascular surgery. To our knowledge, no previous paper applying the MRM for inter-observer reliability analysis in hand surgery has been reported before. The MRM ICC analysis permit adjust for covariates and provided a more comprehensive and reliable estimate of inter-observer agreement by accounting for the nested and repeated-measures nature of the data. Results confirmed excellent reproducibility of TAM measurements between observers.

A-0370 FUNCTIONAL OUTCOMES FOLLOWING NON-SURGICAL MANAGEMENT OF POST-TRAUMATIC EXTRINSIC HAND STIFFNESS

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Introduction: Post-traumatic extrinsic hand stiffness (PTEH) is a frequent complication in hand surgery and therapy. Evaluating functional recovery, such as total active motion (TAM), presents statistical challenges due to the nested nature of the data (fingers within patients). While mixed-effects models are used for nested data in other fields, their application in assessing functional recovery in PTEH has not been widely reported.

Aim: The purpose of this study was to evaluate the outcomes of a conservative treatment protocol, consisting of the Outrigger Crain splint, static traction for the metacarpophalangeal (MCP) joints, and nocturnal static splints, in improving finger TAM and grip strength. Furthermore, it was hypothesized that using a multilevel regression model (MRM) would provide a more precise estimation of the TAM effect magnitude by controlling for the correlation of measurements between fingers within the same patient.

Material & Methods: A total of 31 consecutive patients with a mean age of 63.33 years (SD 10.19) were included in this historic cohort study; 23 (74.20%) were women. Mean follow-up time was 17.41 weeks (SD 11.37).

TAM of fingers was assessed pre- and post-intervention. To account for the data's hierarchical structure, a MRM was applied with measurement (pre/post) as a fixed-effect, and "Patient" and "Finger" as random-effects. Both unadjusted and adjusted models (including age, sex, comorbidity, and follow-up weeks) were fitted. The change in Grip strength was studied by a linear regression model, assessing potential confounders.

Results: A statistically significant improvement in TAM was observed in the unadjusted MRM ($\beta = 44.8$; 95% CI 40.2–49.4; $p < 0.001$), which meant a very large clinical effect size (Cohen's $d = 2.4$). The Likelihood Ratio Test ($p < 0.001$) confirmed the appropriateness of a multilevel structure, consistent with strong between-patient (ICC Id: 0.42) and between-finger (within-patient) (ICC Finger | Id: 0.56) dependency. After adjusting for age, the treatment effect remained unchanged, while between-patient variability decreased. Further inclusion of sex, comorbidities, and follow-up duration did not change the treatment effect. Grip strength improved by a mean of 7.9Kg ($p < 0.001$), with "comorbidities" and "baseline grip strength" being confounders in the effect.

Conclusions: The conservative protocol yielded a large clinical improvement in both TAM and grip strength. The mixed-effects model analysis provides a more comprehensive and reliable estimate of the treatment effect by accounting for the nested (fingers within patients) and repeated-measures nature of the data. This methodological approach is valuable for the precise evaluation of functional recovery in PTEH.

A-0371 BILATERAL DELAYED BONE-MALLET FINGER TREATED WITH HOOK PLATE. CASE REPORT

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Introduction: a 14 y old presented bilateral delayed mallet finger with bone avulsion. pain and reduced rom during daily activities. (after 1 month and after 4 months)

Aim: restore function and quality of life

Material & Methods: surgical treatment was performed in both finger. open approach, local toilette and fixation with a special small hook plate (medartis).

Results: after 3 months, complete healing and recovery of range of motions, no nail problems, no local pain.
Conclusions: a small hook plate is a good solution for the treatment of a delayed union of a bone.mallet finger

A-0373 METHODS OF DISTAL FIXATION OF SILICONE IMPLANTS IN TWO-STAGE FLEXOR TENDON RECONSTRUCTION

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Introduction: Two-stage tendon reconstruction is one of the most common treatment methods for chronic tendon injuries, helping even the most difficult patients. However, surgeons encounter a number of general and specific complications when using this method. One such complication is the separation and migration of the silicone implant. Therefore, ensuring the strength and quality of the distal fixation of the implant is important.

Aim: to compare the strength of the distal fixation of a silicone implant using two of the most popular suturing techniques.

Material & Methods: Laboratory strength tests were carried out using a specialised Shimadzu ANALYTE analytical scale apparatus. Silicone tendon prostheses with a diameter of 5 mm were used. A plate made of low-temperature thermoplastic imitated the distal stump of a tendon. Prolene 2/0 on a round needle (Ethicon) was used as the suture material. The silicone prosthesis was fixed to the thermoplastic plate using two methods: a crisscross suture (method #1) and a modified Kessler suture (method #2).

Results: With method #1, thread eruption began at an average load of 1.71 ± 0.08 kg, whereas with method #2, it began at an average load of 1.46 ± 0.03 kg. Complete detachment of the silicone prosthesis occurred at an average load of 2.78 ± 0.13 kg in the first group and 2.27 ± 0.07 kg in the second group. In the second group, rupture of the silicone rod occurred at the level of the transversely inserted thread. The differences in the average maximum strength values between the two groups are statistically significant ($p < 0.05$). With a probability of over 95%, we can conclude that the suture technique involving intersecting threads is stronger.

Conclusions: In our study, fixing the silicone rod with a cruciform suture was found to be more reliable than fixing it with a U-shaped suture. The experimental data obtained should be taken into account when working with silicone spacers.

A-0375 ULTRASOUND-GUIDED PHALANGEAL FRACTURE REDUCTION IN THE EMERGENCY DEPARTMENT: A HAND THERAPIST-LED APPROACH

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Ultrasound-Guided Phalangeal Fracture Reduction in the Emergency Department: A Hand Therapist-Led Approach

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Background: Point-of-care ultrasound (POCUS) is a rapid, cost-effective, and radiation-free imaging modality for evaluating musculoskeletal injuries, including fractures, dislocations, and tendon or ligament damage. Despite its advantages, POCUS remains underutilised in Emergency Departments (EDs). At Barking, Havering and Redbridge University Hospitals (BHRUH) NHS Trust, average ED waiting times range from 12 to 16 hours, with many hand injuries redirected to Urgent Care, often operated by private providers to manage patient volumes. Traditionally, diagnosis and management of joint dislocations rely on X-ray imaging as the gold standard for identifying fractures and confirming reductions.

This study explored ultrasound as a real-time interventional aid, not as a replacement diagnostic tool, to facilitate faster and safer joint manipulation, reduction, and immediate treatment. A hand therapist with an extended scope of practice and expertise in diagnostic ultrasound performed ultrasound-guided interphalangeal joint reductions, allowing immediate post-procedure confirmation and initiation of hand therapy.

Objectives: The trial aimed to assess the feasibility, safety, and clinical benefits of real-time ultrasound-guided reduction of phalangeal fractures, along with identification of associated soft tissue injuries, in the ED. Immediate immobilisation and structured follow-up were provided by a hand therapist. The study evaluated whether integrating ultrasound into this workflow could improve efficiency while continuing to use X-ray imaging for diagnostic confirmation. The findings indicate that ultrasound-guided reduction is safe, effective, and reliable.

Methods: Thirty-five patients presenting with closed proximal (PIPJ) or distal (DIPJ) interphalangeal joint dislocations without tendon injury were included. A single extended scope hand therapist performed real-time ultrasound under aseptic conditions to assess joint congruency and soft tissue integrity, guiding manual reductions under direct visualisation. Inclusion criteria required closed dislocations without open wounds. Exclusion criteria included fractures involving the articular surface, tendon injury, neurovascular compromise, $\geq 50\%$ dislocation, or a 'V sign' of articular incongruence. Patients with prior surgery on the same hand, chronic wrist instability, or intra-articular/unstable fractures were also excluded.

Post-reduction ultrasound confirmed joint alignment and stability. Patients received immediate conservative management, with one-week follow-up including radiographs, range of motion, VAS pain scores, DASH assessment, and satisfaction surveys. Immobilisation lasted four weeks, followed by early mobilisation per post-fracture protocols.

Results: All 35 cases achieved successful reduction and restoration of normal joint alignment. Post-procedure ultrasound confirmed stable, congruent joints with no complications. Ultrasound guidance reduced the need for additional imaging, enabled immediate therapeutic intervention, minimised radiation exposure, and improved procedural efficiency. Functional outcomes were excellent, and patient satisfaction was consistently high.

Conclusion: Ultrasound-guided reduction by an extended scope hand therapist in the ED is safe, efficient, and cost-effective. It allows rapid assessment, guided reduction, and immediate conservative management in a single visit, improving workflow, reducing waiting times, and delivering high-quality outcomes. Broader use of POCUS may lower costs, limit radiation, and enhance patient satisfaction, with hand therapist-led care providing superior long-term recovery.

Keywords: Ultrasound, Phalangeal Dislocation, PIPJ, DIPJ, Point-of-Care Ultrasound, POCUS, Emergency Medicine, Joint Reduction, Hand Therapy

A-0376 TWO CASES OF AVASCULAR NECROSIS OF THE HAMATE – DIAGNOSIS AND TREATMENT

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Introduction: Avascular necrosis of the hamate (hamate-AVN) is a seldom reported condition, with only a few cases in the literature. There is little known about etiology, the best treatment options and the outcome. This lack is due to the rareness of the hamate-AVN and of the diversity of location within the hamate.

The first description of the hamate-AVN was in 1938 by Logròscino. A literature search on PubMed revealed 12 additional cases. Gelberman described the blood supply of the hamate in 1983. Of which has two areas of distal vessel entry but lack significant intraosseous anastomoses. Compared to other carpal bones, he described this with a low clinical incidence of avascular necrosis.

The aim of this study was to present the possibilities in diagnosis and treatment options for our two patients, representing the second documented case of this rare entity at the Cantonal Hospital of Lucerne.

Materials and Methods

First, a search was conducted on PubMed by using the keywords “avascular necrosis” and “hamate”. A total of 13 case reports were found, which formed the basis for our current case.

As in our cases most effected are middle aged man with a history of a severe trauma or repetitive stress and micro traumata on the ulnar carpus. A possible factor could be unrecognized hamate fractures.

There are no common sensed standards in diagnostic or treatment sequence. Nevertheless, first image is mostly an x-ray, where you can see a slight osteopenia. Followed by a magnetic resonance imaging (MRI) to get informations on perfusion and/or computed tomography (CT) to evaluate structural integrity of the hamate. A scintigraphy or SPECT-CT is sensitive and can reveal focal accumulations, however it is nonspecific.

In literature treatment strategies are based on the treatment options for other avascular necroses of the carpus, mainly Kienbock's disease. These approaches range from non-surgical to surgical reconstruction and salvage operations. The common aims of different treatments are to prevent bone collapse, restore normal carpal height and alignment, and reduce the risk of progressive degenerative changes of the wrist joint.

Nonoperative management, including immobilization, failed in most documented cases. Debridement and arthrodesis were highly associated with loss of motion and functional impairments. The most promising treatment is reported as core decompression combined with revascularization with bone graft from the dorsal distal radius. Overall, this resulted in the best possible outcomes in restoring pain, mobility and strength.

Results and conclusion

We reported two young men who presented with ulnar-sided wrist pain without history of severe trauma but repetitive stress of the carpus. The diagnosis was performed step by step with x-ray, MRI and scintigraphy. The treatment also followed the recommendations with a first try of conservative and afterwards surgical treatment with a good restoration of mobility and strength.

Nevertheless, with very small case numbers, no general recommendations can be formulated. Similar to Kienbock's disease, diagnosis and treatment depend on the stage of necrosis and the patient's needs.

A-0377 A SENSORIMOTOR CONTROL-BASED EXERCISE PROGRAM FOR ASPECIFIC CHRONIC WRIST COMPLAINTS AND MIDCARPAL INSTABILITY: RESTORING BALANCE THROUGH FUNCTIONAL RE-EDUCATION

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A Sensorimotor Control-Based Exercise Program for Aspecific Chronic Wrist Complaints and Midcarpal Instability

This presentation introduces the updated Sensorimotor Control (SMoC)-based Exercise Program for aspecific chronic wrist pain and midcarpal instability—a renewed, evidence-informed version of the Dutch manual Exercise Therapy for Chronic Wrist Complaints (Videler, 2012). Developed in collaboration with hand therapists and hand surgeons, this program has long been part of standard clinical practice in the Netherlands. The updated edition integrates current insights into sensorimotor control, proprioception, and neuromuscular stability, providing a modern, scientifically grounded framework for rehabilitation.

The wrist relies on joint alignment, ligament integrity, muscular balance, and sensorimotor control. In aspecific chronic wrist pain, no structural pathology is present. Instead, persistent pain disrupts proprioceptive feedback and motor planning,

causing protective and inefficient movement patterns. These compensatory patterns further alter sensorimotor control, creating a vicious circle that maintains dysfunction and prolongs symptoms.

The SMOc Exercise Program targets this mechanism through sensorimotor retraining, restoring proprioceptive accuracy, feedforward and feedback control, and coordinated muscle activation to re-establish efficient, pain-free movement.

A central feature is the four-level exercise pyramid, allowing therapists to design individualized programs. Patients progress from small, proprioceptive-based exercises at the base to functional, automatic stabilisation at the top, gradually increasing sensorimotor complexity and moving from conscious to automatic control.

Clinical studies (Mulders et al., 2018; Brands et al., 2023) and feedback from the Dutch Hand Therapy Congress (2024) support its effectiveness and practicality. By combining biomechanical principles with sensorimotor retraining, the SMOc approach provides clinicians with a comprehensive, evidence-based method to restore balance, coordination, and function in patients with chronic, aspecific wrist complaints.

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A-0378 MAINTAINING BALANCE IN UPPER EXTREMITY REHABILITATION: PAIN NEUROPHYSIOLOGY KNOWLEDGE IN OCCUPATIONAL THERAPY PROFESSIONALS AND STUDENTS

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Introduction: Pain is one of the most common and disabling problems encountered in upper extremity injuries, often disturbing the fine balance between movement, sensation, and motor control. Restoring this neurophysiological balance is a central goal of rehabilitation and requires therapists to possess an in-depth understanding of pain mechanisms. Inadequate knowledge of pain neurophysiology may lead to misconceptions about tissue damage, overcautious movement restriction, and suboptimal treatment planning, all of which can interfere with functional recovery. Although physiotherapists' understanding of pain has been widely studied, limited research has explored this topic among occupational therapists (OTs), who frequently work as hand therapists and play a vital role in promoting upper limb function.

Aim: This study aimed to evaluate the level of pain neurophysiology knowledge among occupational therapy students and professionals using the Revised Neurophysiology of Pain Questionnaire (RNPQ).

Material & Methods: A cross-sectional descriptive design was used. Data were collected via an online questionnaire from two groups: OT students (n = 117, 1st–4th year; mean age 21.40 ± 1.5) and OTs (n = 38; mean age 28.16 ± 6.2) currently working in rehabilitation or hand therapy practice. The RNPQ consists of 12 true/false statements assessing conceptual understanding of pain mechanisms, with total scores ranging from 0–12 (higher scores indicating better knowledge). Descriptive statistics were calculated for each group. Data normality was checked with the Shapiro–Wilk test. Group

comparisons were performed using the Mann–Whitney U test; effect sizes were expressed as rank-biserial correlation (r). The significance level was set at $p < 0.05$.

Results: The mean RNPQ score was 6.60 ± 2.17 for students and 7.52 ± 2.21 for OTs. The difference between groups was statistically significant ($p = 0.029$, $r = 0.23$), indicating that practicing therapists had higher pain neurophysiology knowledge, although the effect size was small. Among students, scores increased from first to fourth year (means 5.58 vs 6.8), but this difference was not significant ($p = 0.131$, $r = 0.27$). Item-level analysis revealed heterogeneous performance across domains. Questions on basic nociceptive transmission (peripheral and spinal signalling) showed the highest accuracy, with correct response rates of 71.8–84.6% in students and 76.3–92.1% in professionals. In contrast, fundamental concepts about how sensory messages are encoded were poorly understood (4.3% vs 7.9% correct), as were items targeting misconceptions about chronic pain, proportionality between injury and pain, and the brain's decision-making role in generating pain (23.9% vs 23.7% correct).

Conclusions: Both OT students and professionals showed only moderate understanding of pain neurophysiology, with notable misconceptions related to chronic pain, tissue healing, and cognitive–contextual influences on pain. Although professionals performed better than students, the effect size was small, and several essential concepts remained unclear. Because pain can destabilize the neuromuscular and cognitive balance required for optimal hand function, these knowledge gaps may hinder the effectiveness of upper extremity rehabilitation. Incorporating structured pain neuroscience education focusing on chronic pain mechanisms, neuroplasticity, descending modulation, and contextual factors into OT training and continuing education may enhance clinical reasoning, reduce unhelpful beliefs, and support more effective restoration of functional balance.

A-0379 MANAGEMENT OF COMBAT-RELATED METAEPHISEAL FRACTURES OF DISTAL RADIUS

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Introduction: Recent advances in the surgical management of distal radius metaepiphyseal fractures can be applied in part to combat-related injuries of this localization.

Objective: To evaluate the effectiveness of modern surgical techniques in the treatment of combat-related distal radius fractures and bone defects, and to outline the specific features of their management.

Material and methods: The study includes 16 male patients with combat-related fractures and bone defects of the distal metacarpophysis of radius. The stages of management included wound debridement, VAC, external fixation, soft tissue coverage, and insertion of antibiotic-loaded cement spacers.

Definitive reconstruction was performed using volar plating with bone grafting in 7 cases, total wrist fusion – in 6, and RSL arthrodesis – in 3. Resection arthroplasty of the DRUJ was performed in 7 patients. Outcomes were assessed by wrist range of motion, grip strength, and qDASH scores.

Results: The mean time to functional recovery was 10 months (mode 7; range 4–15) after injury. The mean number of surgical procedures was 4 (mode 5; range 1–7; IQR: 2). Persistent infection (osteomyelitis) occurred in 2 patients (13%). The median final qDASH score was 21 (range 8–48; IQR 14). Grip strength recovered to the median of 14 kg (range 3–22 kg; IQR 5). The mean wrist motion after RSL arthrodesis was 30° (range 10° – 40° ; IQR 10°), which was lower than expected for this procedure.

Conclusions: The treatment of combat-related metaepiphyseal fractures of the distal radius remains complex and multi-staged. Even with the use of modern reconstructive techniques, functional outcomes remain significantly inferior to those

of closed distal radius fractures in civilian patients.

Keywords: distal radius fractures, gunshot injury, osteosynthesis, arthrodesis.

A-0381 DIGIT REPLANTATION OUTCOMES AND THE INTEGRATION OF A DIGITAL MONITORING CHART: A FIVER-YEAR INSTITUTIONAL REVIEW

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Introduction: Digit replantation remains one of the most technically demanding procedures in reconstructive microsurgery, requiring meticulous surgical technique and vigilant post-operative monitoring to ensure success. Despite advances in microsurgical training and equipment, achieving high survival rates continues to be a challenge, particularly in lower-volume centres. The evolution of digital health records presents new opportunities to standardise monitoring and improve communication within the multidisciplinary team.

Aim: Digit amputations, though less frequent in the UK due to improved health and safety standards, continue to present challenges for plastic surgeons. This study reviews our institution's outcomes in digit replantation, introduces and integrated digital monitoring chat within our electronic patient record system, and highlights lessons learned through both successful and unsuccessful cases.

Material & Methods: A retrospective review was conducted using our electronic patient record system (Epic) to identify patients who underwent digit replantation between October 2020 and October 2025. Excluded were composite grafts, abandoned intra-operative replants, and single digital artery repairs not requiring post-operative monitoring. Only cases discharged from theatre with a viable replant were included.

Results: Over five years, seven patients underwent digital replantation or revascularisation involving ten digits in total. All were traumatic amputations except one ring avulsion injury. The overall success rate was 50%, with the non-dominant thumb being the most commonly affected digit. Two patients had to go back to theatre for revision of the anastomosis and replant failure was highest on post-operative day three.

Conclusions: Implementing a structured digit revascularisation and monitoring protocol is vital for consistent patient management. Our institution has developed and integrated a dedicated digital monitoring chart within the electronic patient record system, enabling photographic documentation and continuous staff input to enhance post-operative surveillance and outcomes.

A-0382 THE EFFECTIVENESS OF UPPER-EXTREMITY SURGERY FOR CHILDREN WITH CEREBRAL PALSY: A CRITICAL REVIEW BASED ON THE ICF FRAMEWORK

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Introduction: Children and adolescents with cerebral palsy (CP) often present with upper-limb muscle imbalance, restricted movement and difficulties using their hands in daily activities. Although conservative interventions are beneficial, many continue to experience functional limitations, discomfort or cosmetic concerns that affect participation. Upper-extremity surgery is used to address these challenges by improving muscle balance, joint alignment and hand posture. However, current studies rarely examine outcomes across the International Classification of Functioning, Disability and Health (ICF)

framework, revealing a gap in understanding the broader functional impact of surgery. Aim: The aim of this critical review was to evaluate the effectiveness of commonly used upper-extremity surgical procedures for children and adolescents with CP by examining how postoperative changes in body structure and function relate to activity performance and participation within the ICF framework. The review addresses current gaps and provides insight into the functional impact of upper-extremity surgery for hand therapy practice. Material & Methods: A critical review methodology was applied, guided by established approaches to literature evaluation. A search of three databases (EMBASE, PubMed Central and Scopus) identified studies published between 2015 and 2025, selected for their broad coverage of biomedical, surgical and rehabilitation research. A PICO framework guided keyword selection (Population: children/adolescents 0–17 years with cerebral palsy; Intervention: upper-extremity surgery; Comparison: pre–post outcomes or conservative approaches; Outcomes: motor function, hand posture, activity performance and participation). Eligible designs included randomized and non-randomized controlled studies, cohort studies and case series with ≥ 10 participants to minimize selection bias. Studies involving previous upper-limb surgery or recent adjunct treatments were excluded. Data extraction focused on surgical procedures and postoperative outcomes across ICF domains. Risk of bias was assessed using ROBINS-I for non-randomized studies and RoB 2 for randomized trials. Findings were thematically synthesized to compare outcomes and identify patterns across studies. Results: Fourteen studies met the inclusion criteria and reported positive postoperative changes across ICF domains. At the body structure and function level, most procedures led to improved limb alignment, increased active forearm supination and wrist extension, and reduced deformity severity, with younger children often showing greater gains. Improvements in activity performance were also common, particularly in dynamic hand positioning, unimanual capacity and dexterity, although gains in task speed or long-term function varied. Participation-related outcomes included enhanced confidence, greater perceived hand usefulness and improved cosmetic appearance, especially when goals were developed with families. Children with stronger pre-operative motor patterns tended to show broader functional improvement, while those with more limited patterns mainly achieved structural or aesthetic benefits. Heterogeneity in procedures and outcome measures limited direct comparisons across studies. Conclusions: Upper-extremity surgery for children with CP generally improves limb alignment, active movement and hand posture, although functional performance and participation show more variable outcomes. Children with stronger pre-operative motor patterns tend to achieve broader gains, while long-term improvements remain less predictable. These findings highlight the need for individualized surgical planning and coordinated rehabilitation, and future studies using standardized ICF outcome measures are required to determine which children benefit most and how participation outcomes can be optimized.

A-0383 WHICH DETERMINANTS ARE ASSOCIATED WITH FUNCTIONAL RECOVERY AFTER TRAPEZIOMETACARPAL TOTAL JOINT ARTHROPLASTY?

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Introduction: Commonly performed surgical procedures for thumb base osteoarthritis are trapeziectomy or total joint arthroplasty (TJA) with a prosthesis. Studies report that, compared to trapeziectomy, TJA results in less metacarpophalangeal (MCP) joint extension and better thumb strength. However, functional outcomes measured with the Michigan Hand Outcomes Questionnaire (MHOQ) show no significant differences. MCP hyperextension can negatively affect thumb strength, which may impair activities such as handwriting, manipulating small objects, and opening packages. It remains unclear whether the increased thumb strength after TJA benefits daily function. Patient-reported outcomes

are often used as substitutes for assessing daily hand use, but it is unknown in what way thumb range of motion (AROM) and strength are associated with functional outcomes measured with the MHOQ after TJA.

Aim: The aim of this study is to determine in what way thumb AROM and strength are associated with patient reported daily hand function 3 months after TJA when taking into account the patient-related and disease-specific factors.

Material & Methods: A retrospective study was designed, including patients operated on TMC osteoarthritis with TJA between November 2018 and July 2023. Patient variables and clinical assessments comprised of patient- (sex, age and dominant hand) and disease specific factors (side of surgery and ASA-score), MHOQ total- and subscale scores, AROM, strength measurements and satisfaction with the results. Patient data were eligible when questionnaires pre- and post-surgery were present, as well as post-surgical measurements. To evaluate multivariate associations, accounting for patient- and disease-specific factors, a hierarchical linear regression analysis was performed with MHOQ as the outcome variable. With 13 independent variables, 160 patients and an alpha of 0.05 the calculated power was 0.93.

Results: 160 patients (81.3% females) were included with a mean age of 61.2 (8.5). The outcomes showed that the MHOQ total score can be explained for 51% with the variables in the regression model, with gender, MHOQ at baseline, grip strength and satisfaction with the result contributing significantly to this model. No significant associations were found for thumb AROM and pinch and key-pinch strength.

The design of the MHOQ can explain the weak association between (key)pinch strength and the MHOQ score. In the ADL subscale score, which resembles daily hand function the most, only four out of twelve questions represent activities requiring thumb strength. Despite the improvement of MHOQ scores post-surgery, the MHOQ as substitute for daily hand function seems not a precise functional outcome measure after TMC surgery. It does not capture daily activities related to thumb strength and the ADL subscale showed a large ceiling effect.

Conclusions: Clinical outcomes such as AROM and strength of the thumb may seem to play a minor role in determining the functional and satisfactory treatment outcome. However, a definitive statement can only be made when a patient reported outcome is measured with an appropriate instrument. The strong association with satisfaction emphasizes the importance of shared decision making to determine surgical indications, treatment goals and facilitating functional recovery.

A-0384 MICROFASCIOTOMY IN DUPUYTREN DISEASE: IS PRECISION WORTH THE TIME?

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Introduction: Dupuytren's disease is a progressive fibroproliferative disorder of the palmar fascia that causes finger contractures and functional impairment. Surgical fasciectomy remains the gold standard for advanced disease, but recurrence and complications remain common. Microfasciectomy (MF) introduces microsurgical techniques to enhance anatomical precision and potentially reduce recurrence. Whether these benefits justify the increased operative time is unclear.

Aim: To compare the effectiveness, safety, and operative efficiency of microfasciectomy versus traditional fasciectomy in the treatment of Dupuytren's disease.

Material & Methods: A single-centre retrospective analysis was conducted. The MF cohort included patients treated between 2019 and 2021 (excluding 2020 due to COVID-19), while the historical fasciectomy cohort comprised patients treated in 2010–2011. All procedures were performed by the same expert surgeon to ensure consistency. Exclusion criteria were minor metacarpophalangeal (MCP) contractures (<20°), Moermans technique, concomitant carpal/cubital tunnel release, or isolated knuckle pad excision. Baseline demographics, Dupuytren diathesis scores, operative details, complications,

and recurrence were extracted from medical records. Recurrence was defined as $\geq 20^\circ$ increase in flexion contracture at MCP or PIP joints compared to the 6-week postoperative measurement. Statistical significance was set at $p < 0.05$.

Results: A total of 127 patients were included: 33 underwent traditional fasciectomy and 94 underwent MF. Age and sex distributions were comparable between groups. Median follow-up was longer for MF (15.5 vs. 10.4 weeks). Both techniques achieved similar correction of contractures (mean residual deficit: 12° MF vs. 14° fasciectomy). MF demonstrated a significantly lower recurrence rate (13.8% vs. 33.3%, $p = 0.028$) without an increase in overall complications. Sensory disturbances were more frequent after MF, but generally transient. Operative time was substantially longer for MF (mean 94 vs. 58 minutes, +62%). Hospital stay was slightly shorter for MF (0.62 vs. 0.85 days).

Conclusions: Microfasciectomy provides equivalent correction of Dupuytren contractures compared to traditional fasciectomy, with a markedly lower recurrence rate and similar complication profile. However, these benefits come at the cost of significantly longer operative time and higher procedural expense. MF appears to be a promising evolution in surgical management of DD, but prospective studies are needed to confirm its long-term advantages and cost-effectiveness.

A-0385 DOUBLE CRUSH SYNDROME IN THE MEDIAN NERVE: OUTCOMES OF CONCURRENT CARPAL TUNNEL AND LACERTUS RELEASE

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Introduction: Proximal median nerve compression (PMNC) at the level of the lacertus fibrosis can coexist with carpal tunnel syndrome (CTS), referred to as Double Crush Syndrome. PMNC is often overlooked, underdiagnosed, and undertreated, causing residual symptoms after a solitary Carpal Tunnel release (CTR). A better understanding and recognition of Double Crush Syndrome is necessary for a targeted surgical approach to improve outcomes.

Aim: This study evaluates the treatment outcomes after Double Crush release, combining CTR with Lacertus release.

Material & Methods: This observational cohort study included patients undergoing Double Crush release of the median nerve, combining CTR with Lacertus release. The primary outcome was change in Boston Carpal Tunnel Questionnaire symptom severity (SSS) and functional status (FSS) score from 12 months after Double Crush release. Secondary outcomes included patient satisfaction, tip pinch strength, time to return to work, and complications, including revision surgery.

Results: 72 Double Crush releases were included. Three months postoperatively, improvements in both SSS and FSS were found, and remained stable up to 12 months postoperatively. The BCTQ SSS and FSS changed from 3.33 and 2.79 at intake to 1.81 and 1.91, respectively, 12 months postoperatively. Overall, 89% of DCS patients reported satisfaction with surgery. Tip pinch weakness was found in 85% of cases preoperatively and decreased to 16% after 12 months.

Conclusions: Combined Carpal Tunnel and Lacertus release is an effective treatment for Double Crush Syndrome of the median nerve. 12 months after Double Crush release, improvements in symptom severity, functional status, and tip pinch strength were observed with high patient satisfaction.

A-0386 MEDE STUDY PROTOCOL: A RANDOMIZED CONTROLLED TRIAL COMPARING MEDIAN NERVE DECOMPRESSION AT THE CARPAL TUNNEL ALONE VERSUS MEDIAN NERVE DECOMPRESSION AT BOTH THE CARPAL TUNNEL AND LACERTUS FIBROSIS IN ADULTS WITH CARPAL TUNNEL SYNDROME

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Introduction: Up to 43% of patients experience residual symptoms after a carpal tunnel release, necessitating secondary surgical interventions in approximately one out of eight carpal tunnel releases. These residual symptoms may be attributable to proximal median nerve compression (PMNC), which can potentially be alleviated by performing a Lacertus release. However, diagnosing PMNC poses a challenge, as standard diagnostic tools like physical examination, electromyography and ultrasound lack the specificity to distinguish between CTS and PMNC. Consequently, PMNC often goes undetected and untreated.

Aim: This randomised trial compares patient-reported outcomes following median nerve decompression at the carpal tunnel alone versus at both the carpal tunnel and the Lacertus fibrosus in individuals with CTS.

Material & Methods: Inclusion criteria are adult patients (≥ 18 years) with CTS, as confirmed by electromyography or ultrasound. The primary outcome is the Boston Carpal Tunnel Questionnaire Symptom Severity Scale (BCTQ SSS) score after twelve months. Secondary outcomes are the total BCTQ score, BCTQ Functional Status Scale, residual and persistent symptoms, recurrence, pillar pain, sensibility, tip-pinch strength, Return to work, Quality of life assessed with the EQ-5D-5L questionnaire, cost-effectiveness and cost-utility, additional surgical interventions, and complications. Sample size calculation showed that 110 patients must be randomised.

Conclusions: The MeDe study will provide evidence of whether Median nerve Decompression at the carpal tunnel combined with Median nerve Decompression at the Lacertus fibrosis results in better patient-related outcomes and quality of life compared to Median nerve Decompression at the carpal tunnel alone in adult patients with Carpal Tunnel Syndrome.

A-0388 THE RELATIONSHIP BETWEEN PLATE PLACEMENT SITE AND POSTOPERATIVE RANGE OF MOTION IN PROXIMAL PHALANX FRACTURES OF THE HANDS

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Introduction: For proximal phalanx fractures of the hands, conservative treatment is the first choice, but surgical treatment is indicated for fractures which external fixation cannot maintain reduction position or for open fractures.

Aim: This study investigated the relationship between the placement site of plates and postoperative range of motion, focusing exclusively on plate fixation for proximal phalanx fractures.

Material & Methods: A retrospective analysis of 13 patients 14 fingers treated with plate osteosynthesis in our hospital for proximal phalanx fracture other than the thumb between October 2018 and June 2025 was conducted. The fingers which have tendon rupture or concomitant fractures of other phalanges in the affected finger were excluded in this study. The following factors were investigated: age, fracture type, concomitant injuries, preoperative waiting period, follow-up period, plate placement location (palmar, dorsal, lateral), presence of bone union, complications, and final range of motion. **Results:** Of the 13 patients, including 9 male and 4 female, the mean age was 53.4 years (± 19.0). Four fingers were open fractures. Six fingers had concomitant injuries to fingers other than the affected one. The median preoperative waiting

period was 6.5 days (range 0–18), and the median follow-up period was 5.8 months (range 2.5–32.5). Five fingers were palmar plating, 5 were dorsal and 4 were lateral with all cases achieving bone union. Two fingers (both dorsal) underwent tendon and capsular release for contracture as a post-operative complication. The post operative median Total Active Motion (TAM) was 230.0° (range 100–275) overall, with 230.0° (range 212–265) for the palmar group, 132.0° (range 100–240) for the dorsal group, and 252.5° (range 236–275) for the lateral group. In the comparison of TAM among the three groups, the dorsal group was significantly lower than the palmar and lateral groups. No significant difference was observed between the palmar and dorsal groups.

Conclusions: From the perspective of postoperative range of motion, when performing plate fixation for proximal phalanx fractures, dorsal placement should be avoided, and either palmar or lateral placement should be selected based on the fracture type.

A-0389 PATIENT SATISFACTION IN THE TREATMENT OF DUPUYTREN'S CONTRACTURE THROUGH LIMITED FASCIECTOMY UNDER WALANT VS. BRACHIAL PLEXUS BLOCK. A PROSPECTIVE COHORT STUDY

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Introduction: Limited fasciectomy (LF) for Dupuytren's contractures can be performed under various anaesthesia techniques, including Wide-Awake Local Anaesthesia No tourniquet (WALANT) and brachial plexus block. The WALANT technique enables LF to be performed in an outpatient setting, potentially improving efficiency and patient satisfaction.

Aim: To evaluate whether WALANT patients are more satisfied compared to plexus block patients, whilst maintaining the effectiveness of LF in the treatment of Dupuytren's contracture.

Material & Methods: A prospective observational cohort study was conducted on patients with a primary Dupuytren's contracture in stage I or II of the Tubiana Classification System that were treated with LF. Inclusion of patients took place between December 2024 and November 2025. Patient satisfaction measured at one week postoperatively was the primary outcome and was assessed using the visual analogue scale (VAS). Secondary outcomes included: reduction of total passive extension deficit (TPED) postoperatively, duration of surgery, time in hospital, intra- and postoperative pain scores, use of analgesics and complication rates up to six weeks postoperatively.

Results: Twenty-seven patients were treated using WALANT (24 males) and twenty under brachial plexus block (15 males). The mean age was 63.7 (10.1) years in the WALANT group and 66.5 ± years in the plexus block group. The dominant hand was affected in fourteen patients in the WALANT group and in nine patients in the plexus block group ($p=0.77$). The median difference in patient satisfaction was 0 mm ($p=0.69$). More patients in the WALANT group indicated they would "definitely" recommend their anaesthesia to others (WALANT: $n=21$; plexus block: $n=7$, $p=0.02$). Despite a comparable time of surgery, WALANT-patients spent significantly less time in the hospital (median difference: -120.0 min, $p<0.001$). Patients in the WALANT-group reported more pain during anaesthesia administration (median difference: 13.0 mm, $p=0.02$) but required postoperative analgesics for fewer days (median difference: 5.0 days, $p=0.02$). Improvement in TPED 6 weeks postoperatively was comparable in both groups (WALANT: 42,2° (21,2); plexus block: 42,6° (21,3), $p=0.81$). Intra- and postoperative pain scores, type of analgesics used, and complication rates were comparable between groups. Complication rates were comparable between groups (WALANT 25.9% vs. plexus block 20.0%, $p=0.737$). Complications were mostly classified as Grade I according to the ICHAW classification and included persistent paraesthesia, scar tenderness, and limited range of motion requiring splinting or hand therapy. Two higher-grade complications occurred only in the WALANT group: one wound infection and one tendinous paronychia requiring surgical intervention and antibiotics.

Intra- and postoperative pain scores and type of analgesics used, were comparable between groups.

Conclusions: We conclude that WALANT represents an effective alternative to brachial plexus block for the management of Dupuytren's contracture. This technique provides high levels of patient satisfaction, obviates the need for an anesthesiologist, and significantly reduces hospital stay duration.

A-0390 PREDICTIVE FACTORS FOR RE-DISPLACEMENT IN DISTAL RADIUS FRACTURES

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Introduction: Despite the multiple treatment options available for displaced distal radius fractures, there is no early and reproducible criterion to guide therapeutic decision-making. This study aims to identify radiographic and clinical predictors of early and late re-displacement and provides a basis for developing an individualized management algorithm according to patient-specific factors.

Methods: We conducted a retrospective analysis of 279 consecutive distal radius fractures initially treated with closed manipulation, reduction and cast immobilization between August 2019 and August 2024 at our centre. Radiographic evaluations were performed at 1-, 2-, and 4-weeks post-reduction, alongside collection of clinical data. Re-displacement was defined as the presence of at least 2 of 3 criteria: ulnar variance >2 mm, dorsal tilt $>10^\circ$, or intra-articular step >2 mm. Re-displacement detected during the first week was classified as early, whereas re-displacement first observed at week 4 was classified as late. Univariate and multivariate logistic regression analyses were performed to identify predictors of early and late re-displacement. The findings were used to develop an algorithm based on radiographic and patient-related factors to guide treatment decisions.

Results: The mean patient age was 66 ± 4.18 years, with 72.8% female. At week 1, 59 patients (21%) experienced early re-displacement, and 40 of them required surgical treatment. Predictors of early re-displacement were pre-reduction dorsal tilt $>20^\circ$ (RR 3.9, $p<0.001$), post-reduction capitate shift ≤ -6 mm (RR 4.1, $p<0.001$), dorsal comminution (RR 3.6, $p<0.001$), intra-articular fracture line (RR 2.1, $p<0.001$), age >65 years (RR 3.1, $p<0.001$), and BMI >30 (RR 1.6, $p<0.001$). At the 4-week follow-up of the remaining 220 patients, 74 (33.6%) exhibited late re-displacement. Predictors of late re-displacement included capitate shift ≤ -6 mm at week 1 (RR 4.3, $p<0.001$), radial height <10 mm at week 1 (RR 2.5, $p<0.001$), dorsal comminution (RR 3.9, $p<0.001$), age >65 years (RR 3.4, $p<0.001$), and a history of fragility fractures (RR 2.2, $p<0.001$).

Conclusions: The most consistent predictors of re-displacement were age >65 years ($p<0.001$), dorsal comminution ($p<0.001$), and capitate shift ≤ -6 mm ($p<0.001$). Based on logistic regression and combined risk modelling, patients presenting with two or more of these factors have an estimated risk of re-displacement exceeding 60–70% (RR >4). In such cases, primary surgical fixation should be considered over cast immobilization to prevent loss of reduction and the need for secondary procedures. These key radiographic variables, together with patient-related characteristics such as obesity or a prior history of fragility fractures, can be integrated into an individualized treatment algorithm. This evidence-based framework provides a practical and reproducible approach to optimizing management and improving outcomes in distal radius fractures.

A-0391 A NEW SPAGHETTI WRIST PROGNOSTIC CLASSIFICATION PROPOSAL

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Introduction: Spaghetti wrist injuries represent a rare but complex traumatic condition of the volar compartment of the wrist, involving the simultaneous transection of flexor tendons, major nerves, and vascular structures. The heterogeneity of injury mechanisms and the absence of a universally accepted classification make it challenging to standardize diagnosis, treatment, and prognosis.

Aim: The objectives of this study include the collection of anamnestic, clinical, and ultrasound data on patients affected by this rare traumatic pathology of the distal forearm, aiming to expand available case series in certified databases. A further goal is to develop and propose a new prognostic classification, given the lack of a universally recognized system. The 2018 Koshy classification will also be reviewed and compared with our proposal.

Material & Methods: This retrospective observational study enrolled 35 patients with no prior local pathology of the affected limb. Participants varied in ethnicity, age, sex, education, occupation, and social background. All had sustained traumatic wounds involving a single upper limb, localized between the distal wrist crease and the proximal limit of the distal third of the forearm. Injuries involved at least three structures (flexor tendons, the ulnar or radial artery, and the ulnar or median nerve) with the requirement of at least one major nerve lesion (median or ulnar). All patients were treated in our Hand Surgery Department between 2014 and 2024 by a Senior Surgeon. None had psychiatric, neurological, or degenerative conditions that could compromise postoperative rehabilitation. Lesions were limited to the soft tissues of the volar compartment. Surgical repair included end-to-end tenorrhaphy [using the Kessler technique], arteriorrhaphy, and microsurgical end-to-end neurorrhaphy, performed within the early treatment window as required. Follow-up included satisfaction questionnaires (DASH, MHQ), clinical evaluations (finger and wrist ROM, MRC grades for thumb opposition and little finger abduction, and assessment of residual deformities), and instrumental testing. Ultrasound follow-up (Hechmatt scale of thenar/hypothenar muscles) verified tendon, nerve, and vascular continuity, as well as nerve echostructure and possible neuroma formation. Data on chronic deformities, neuropathic symptoms, and sensory recovery were also recorded. Statistical analysis of the dataset is currently in progress.

Results: Final results are not yet available, as the study is ongoing. Preliminary findings indicate that the most relevant positive prognostic factors are young age at trauma and full adherence to structured rehabilitation protocols within specialized hand rehabilitation units. Conversely, double nerve injuries and isolated ulnar nerve lesions appear to correlate with poorer outcomes compared to single median nerve injuries.

Conclusions: A new prognostic classification system for spaghetti wrist injuries is currently being developed, integrating previous risk factors.

A-0392 INVESTIGATION OF REACTION TIME IN CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY: A CONTROLLED STUDY

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Introduction: Brachial plexus birth injury (BPBI) causes structural changes in the musculoskeletal system, sensory deficits, central nervous system alterations. However, reaction time (RT), which reflects the coordination between the sensory and

motor components of movement and indirectly indicates the integrity of the central nervous system and information-processing ability, has not been extensively studied in BPBI.

Aim: The aim of this study was to compare the reaction time of the affected side in BPBI with the unaffected side and with healthy age-matched controls. Furthermore, we aimed to examine the relationships between the reaction time of the affected upper extremity and total active joint movements, upper extremity performance, bilateral coordination, and balance parameters.

Material & Methods: The study was conducted with the approval of the ethics committee and included 76 children with upper trunk injuries and 72 healthy children as a control group. Upper extremity reaction time was assessed electronically using a wireless LED light device, and average reaction times were recorded in milliseconds (ms). Active movements were assessed using the Active Movement Scale (AMS). Upper extremity performance was measured using the Box and Block Test (BBT). Bilateral coordination and balance were assessed using the Bruininks Oseretsky Motor Proficiency Test. Differences between the affected and unaffected sides, the differences between the affected side and the nondominant side of healthy peers, and the relationships between the data were examined using the IBM SPSS Version 27. Statistical significance was set at $p < 0.05$.

Results: There was a difference between the reaction time of the affected side (Mean: 555.3 ms, standard deviation (SD): 89.5) and the unaffected side (Mean: 495.9 ms, SD: 73.7) of children with BPBI ($p < 0.001$). There was a difference between the reaction time of the affected side (Mean: 555.3 ms, SD: 89.5) of children with BPBI and the reaction time of the non dominant side (Mean: 476.2 ms, SD: 71.7) of their healthy peers ($p < 0.001$). A weak negative correlation was found between the reaction time of the affected side and the AMS total scores ($p < 0.05$, $r = -0.31$). A strong negative correlation was observed between BBT scores determining the performance of the affected arm, and reaction time ($p < 0.001$, $r = -0.72$). A moderate negative correlation was found between individuals' bilateral coordination scores and reaction times ($p < 0.001$, $r = -0.51$), while there was a moderate positive correlation between individuals' upper extremity sensation and reaction times ($p < 0.001$, $r = 0.42$). There was no correlation between balance and upper extremity reaction time on the affected side ($p = 0.12$).

Conclusions: The reaction time of the affected side in children with BPBI was higher than both the unaffected side and the nondominant side of their healthy peers. It was found that a decrease in reaction time in the affected side was associated with improved upper extremity performance and bilateral coordination. Therefore, we believe that reaction time should be evaluated and given greater importance in rehabilitation processes to improve success in sports and daily living activities that require upper extremity performance and bilateral coordination in BPBI.

A-0393 OPERATIVE TREATMENT OF ISOLATED LUNOTRIQUETRAL LIGAMENT INJURIES – A CASE SERIES

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Introduction: Lunotriquetral (LT) ligament injuries are rare and often underdiagnosed. Difficulties in diagnosing these injuries exist, due to lack of radiological findings and not conclusive physical exam. Combining these factors, operative treatment of isolated LT ligament injuries is performed rarely, and therefore very limited data exist on the optimal treatment options and their long-term outcome.

Aim: The aim of this study was to examine postoperative outcome and return to work of isolated acute LT ligament injuries, using open or arthroscopic assisted techniques. Although arthroscopic repair with reconstruction of the LT ligament using the extensor carpi ulnaris (ECU) has already been performed, limited postoperative data are reported so far.

Methods: We performed a retrospective follow-up of patients with isolated LT ligament injuries treated in our institution from 2017 to 2025. Follow-up was performed 6 weeks, 3 and 6 months postoperative. Preoperative data, including range of motion (ROM) and MRI image were assessed. Outcome measures included ROM, stability of the LT joint in physical examination and conventional radiography.

Results: A total of 7 isolated LT ligament injuries (4 male and 3 female) could be verified by wrist arthroscopy since 2017 in our institution.

In 6 patients the intraoperative findings differed from the preoperative performed MRI.

Arthroscopically the dorsal and volar LT ligament was compromised in 3 patients. An isolated injury to the dorsal or volar ligament respectively could be found in 4 patients.

LT ligament repair was performed by ECU tendon graft in all cases (combined with temporary arthrodesis in 2 cases). Repair was done arthroscopically in 2 patients and open in 5 patients by the same physician. Concomitant TFCC injuries, which were found in 3 patients, were treated arthroscopically by using knotless suture anchors.

LT Ballotement test was stable in all patients after operative treatment. Pain level was reduced in 3 patients in average 6 months postoperative. After open repair two patients reported neuropathic pain at the 6-month follow-up caused by perioperative (anaesthetic block) and intraoperative nerve complications (damage of dorsal branch of the ulnar nerve). One patient developed a chronic pain syndrome.

Return to preoperative work could be achieved in all patients.

Conclusions: So far limited postoperative data exist about patients with isolated LT ligament injuries due to difficulties in diagnosing and consequently indicating operative treatment. As this small cohort of patient shows, MRI data do not reliably show the extent of LT ligament injuries. Therefore, in doubt, wrist arthroscopy should be performed to evaluate the carpal ligaments. The presented data show that operative treatment provides satisfying outcomes for the patients concerning pain reduction and mobility as well as return to work.

A-0394 THUMB RECONSTRUCTION AFTER FAILED REPLANTATION: RESTORING FUNCTIONAL BALANCE THROUGH METACARPAL LENGTHENING AND WEB SPACE DEEPENING

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Aim: To present metacarpal distraction lengthening with interposition of an autologous iliac crest bone graft and secondary web space deepening as a balanced and biological reconstructive option after failed thumb replantation, aiming to restore the functional equilibrium and proportional architecture of the hand.

Material & Methods: Two male patients were treated between September 2021 and September 2024 following failed thumb replantation. The first sustained a domestic circular saw injury, and the second a crush injury involving heavy iron. Replantation was initially attempted but failed due to extensive soft-tissue necrosis and non-viable vascular structures. Secondary reconstruction involved metacarpal distraction osteogenesis using a mini external fixator. After achieving the desired length, a corticocancellous iliac crest bone graft was interposed to stabilize and consolidate the regenerate. In a secondary stage, web space deepening was performed to improve thumb abduction and opposition.

Follow-up ranged from 27 to 36 months. Functional assessment included bone consolidation, length gain, sensibility (two-point discrimination), pinch strength, overall hand balance, and professional reintegration.

Results: Treatment duration averaged 31 months (range 27–36), with a mean length gain of 25 mm (range 20–28 mm). Both patients achieved full bone consolidation and maintained soft-tissue integrity without major complications. Sensory recovery was preserved with a mean two-point discrimination of 4 mm.

Both reconstructed thumbs achieved near-symmetrical proportion and balanced interaction with the index finger, resulting in stable tripod pinch and improved grip strength.

One patient returned to full manual work as a truck mechanic performing heavy tasks; the other successfully completed vocational retraining and now works 90% as a bus driver. Radiographs confirmed solid graft integration and correct alignment. Both patients reported high satisfaction with function, strength, and aesthetic hand balance.

Conclusions: Metacarpal distraction lengthening with interposition of iliac crest bone graft and web space deepening can be a safe and functionally balanced reconstructive option after failed thumb replantation.

This technique restores skeletal continuity, sensibility, and biomechanical harmony of the first ray, contributing to the recovery of coordinated hand function, strength, and occupational independence.

A-0396 A GIRFT ANALYSIS OF NERVE CONDUCTION STUDIES IN CARPAL TUNNEL SYNDROME

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Introduction: Nerve conduction studies (NCS) are widely accepted as the gold standard investigation in carpal tunnel syndrome (CTS). Recent guidelines focus on best practice (BSSH) but also focus on issues of access to health care services (NHS GIRFT – Getting it right first time).

Aim: The aim of this study was to assess the ongoing role of NCS in the management of CTS and assess its impact and influence on patient outcomes.

Material & Methods: All patients referred for query carpal tunnel syndrome to our hand therapy-led clinic in our unit between January 2024 and June 2025 were included in this study. Retrospectively collected data included patient demographics, time of referral, time of initial review, clinical presentation, clinical decision-making process, and Boston Carpal Tunnel syndrome Questionnaire (BCTQ). Outcomes were compared to the Getting It Right the First Time (GIRFT) adult carpal tunnel guideline by the British Society for Surgery of the Hand (BSSH).

Results: In total 158 patients were referred with suspected CTS. Average waiting time from referral to review was 166 days. A decrease in waiting time was seen from 200 to 96 days in 2024 and 2025 respectively. The average age was 54 years, with a distribution between 22 and 89 years. Of the patients presenting to our service, 66% (76 patients) had symptoms bilaterally.

Nerve conduction studies were requested for 52 patients (46%) however 37% (n=19) of these requests were made prior to specialist review. NCS were only deemed necessary in 12% (n=6) of cases following specialist review. The average waiting time for nerve conduction studies was 448 days (range 68-1659 days). CTS was confirmed on NCS in 84% of cases. 39% (n=12) of patients received a steroid injection in addition to being referred for NCS.

In our patient cohort 36% of patients received conservative treatment alone, which was successful in 88% of cases. Waiting time for surgery was longer than waiting time for a corticosteroid injection, with average time being 100 and 158 days respectively.

In clinically severe cases of CTS, 43% of patients went straight to surgery without NCS.

Conclusions: Our study identifies referral for NCS as the most significant factor in leading to delay in treatment. In an era of constrained resources, referrals for NCS should be restricted to cases where an alternative diagnosis is considered rather than confirming a strong clinical suspicion of CTS. We recommend the use of corticosteroid injection as a diagnostic and therapeutic intervention.

A-0397 SINGLE-STAGE FOREARM RECONSTRUCTION FOR SOLITARY PULMONARY BONE METASTASIS – TECHNICAL AND FUNCTIONAL CONSIDERATIONS

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Background: Metastatic lesions to the forearm are exceptionally rare, and their management involves both oncological and functional challenges. We report a case of functional forearm reconstruction following diaphyseal destruction of the radius, caused by a solitary metastasis from infiltrative pulmonary adenocarcinoma.

Clinical case: A 47-year-old male was referred to our department by the oncology team due to a progressively enlarging tumour mass in the right forearm. A few years earlier, he had undergone partial lung resection due to the primary tumour. Recent radiological investigations performed prior to referral revealed no additional pathological lesions. Biopsy confirmed that the forearm lesion was a metastasis from the primary lung tumour.

The patient reported forearm swelling, instability, loss of strength and pain. Due to the recurrence of the lung tumour and an estimated survival of 1,5 years, as provided by the oncologist, and considering the patient's wish to preserve function with a single-stage procedure and refusal of amputation, we elected to perform a single-stage surgery including metastasis excision and functional reconstruction of the forearm using the one-bone forearm-technique.

We successfully resected the tumour while preserving motor and sensory innervation, as well as key musculature, enabling the initiation of active and passive-assisted physiotherapy postoperatively. Two months after the surgery, the patient was able to bear weight on the forearm, lean on his walking aid without difficulty, and perform fine motor tasks. **Conclusion:** This case highlights that forearm reconstruction using local tissues is feasible even after extensive resection, emphasizing that careful preoperative planning and following strict surgical principles can lead to satisfactory oncological and functional outcomes.

A-0398 MODIFIED CMC I RESECTION ARTHROPLASTY WITH LTI RECONSTRUCTION - A MULTICENTRIC EXPERIENCE

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Introduction: Osteoarthritis of the first carpometacarpal (CMC I) joint is a common degenerative condition that significantly impairs hand function and quality of life. While non-surgical management remains the initial approach, trapeziectomy with ligamentous tendon interposition (LTI) has become an oft-used surgical treatment for advanced disease stages. The procedure involves excision of the trapezium and placement of a tendon flap to stabilize the first metacarpal. On the other hand, this work aims to show the effects of a less commonly used modified surgical approach in which the trapezium is partially resected, while the palmar oblique ligament is reconstructed in the usual way.

Aim: This multicentric study aimed to evaluate the clinical and functional outcomes of a modified CMC I resection arthroplasty with LTI reconstruction using a standardized surgical technique, addressing ongoing debates regarding its efficacy and reproducibility across different centres.

Material & Methods: A total of 132 patients (104 females, 28 males; mean age 61.7 years, range 45–78) underwent CMC I resection arthroplasty with LTI reconstruction between January 2019 and October 2025 at two tertiary hospitals, performed by three hand surgeons.

Results: The study demonstrated substantial pain relief, improved pinch and grip strength, and enhanced functional

outcomes. Complication rates were low, with no major adverse events.

Conclusions: CMC I resection arthroplasty with LTI reconstruction provides pain reduction, functional recovery, and stability. The multicentric design and standardized methodology enhance the generalizability of results, reinforcing this procedure as a reliable surgical option for advanced CMC I osteoarthritis.

A-0399 HOW NECK ANGULATION AND STEM ROTATION AFFECT THE METACARPAL'S POSITION IN TRAPEZIOMETACARPAL JOINT REPLACEMENT: A 3D ANALYSIS

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The ball-and-socket designed trapeziometacarpal joint replacement obtains good strength, faster and better pain relief, while preserving range of motion, with a ten-year survival of more than 91%. Despite the good functional outcome, this design of thumb base prosthesis cannot fully replicate the kinematics of the original saddle joint, and this could explain why complications, such as luxation and loosening of the cup occur. To reduce the 8,4% complication rate, guidelines for optimal positioning of the prosthetic components are warranted. Some surgical guidelines, including orientation of the distal articular trapezial osteotomy and cup, have been proposed, but these are based on retrospective clinical studies. Pilot data shows that the center of rotation of the ball and center of rotation of the socket don't match if the current guidelines are followed. To date, limited 3D analytic data has been published on this subject.

This study analyses the three-dimensional (3D) anatomy of the trapeziometacarpal (TMC) joint to correlate with that of the ball-and-socket designed trapeziometacarpal joint. It evaluates how the neck angulation and stem rotation of the ball-and-socket prosthesis respects the kinematics of the native joint and the anatomical position of the metacarpal and evaluates the most common sites of impingement.

CT-scans of the thumb base of 40 patients are included of which twenty patients without signs of osteoarthritis and 20 patients with signs of osteoarthritis. Different cup placements are compared to all commercially available neck shapes and lengths. The area of contact between the 1st and 2nd metacarpal is determined and is build on the outcomes of the previous aims.

The purpose of this study is to evaluate the different positional factors for improving the longevity of the prosthesis by 3D analysis.

A-0400 HARVEST OF A FASCICLE OF ULNAR NERVE FROM POSTERIOR APPROACH AS A DONOR NERVE IN UPPER BRACHIAL PLEXUS INJURIES

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Introduction: in spite of its long story of nerve transfer, this procedure changed the strategy of the treatment of traumatic brachial plexus injuries (BPI) dramatically after Oberlin procedure in 1994. Then after a lot of nerve transfers has been presented. In upper BPI, Ulnar nerve is a common donor nerve for nerve transfer, but all of these transfers has been described through anterior approach. We reviewed our patients with BPI treated by nerve transfer from ulnar nerve via posterior approach and their results.

Aim: to evaluate our results of a fascicle of Ulnar nerve transfer to Axillary nerve and Triceps branch of radial nerve via posterior approach

Material & Methods: Material and Method: from March 2018 to February 2025 we had 18 patients with upper brachial plexus injuries treated with nerve transfer including nerve transfer from ulnar nerve from posterior approach. With semi-lateral position and posterior longitudinal approach ulnar nerve was explored just medial to radial nerve at the beginning of their course between long head and lateral head of triceps. A fascicle of ulnar nerve was chosen and transferred to a branch of triceps or axillary nerve. The final MRC scale of the recipient muscle evaluated after at least 18 months after surgery. **Results:** We evaluated the results of 15 of our patients with more than 18 months follow up. 7 patients had transfer to triceps branch and 8 patients to axillary nerve. The final MRC scales of the recipient muscle reached to four in three patients, three in 9 patients two in one patient and zero in two patients.

Conclusions: In Upper brachial plexus injury ulnar nerve is a main donor nerve for nerve transfer. The recipient of this nerve is usually elbow flexors. In C5C6C7 injuries elbow Triceps brachii and deltoid reanimation needs some sources. With a good median nerve for reanimation of elbow flexors, we can keep the ulnar nerve for other muscles. Ulnar nerve exploration from posterior approach is very simple and gave us an easy access to triceps branches and axillary nerve and makes it easy to transfer of a fascicle of ulnar nerve to triceps branches or axillary nerve. We suggest these transfers for extended upper BPI.

A-0401 SYMPTOMATIC HAMATE–PISIFORM COALITION: A RARE CAUSE OF ULNAR NERVE COMPRESSION AT THE WRIST

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Introduction: Hamate–pisiform coalition is an exceptionally rare congenital anomaly of the carpus, characterised by partial or complete fusion between the pisiform and the hook of the hamate. The embryological mechanism remains uncertain but is thought to result from metaplastic ossification of the pisohamate ligament or the distal portion of the flexor carpi ulnaris tendon. Fewer than twenty-five cases have been documented worldwide. Traditionally considered incidental and asymptomatic, emerging evidence indicates that such coalitions may cause clinically significant symptoms, including hypothenar pain, swelling, and ulnar neuropathy, particularly following repetitive microtrauma.

Aim: This report describes a case of symptomatic incomplete hamate–pisiform coalition in a young adult female, analysing its clinical and radiological features and emphasising its importance as an uncommon aetiological factor in ulnar nerve compression at the wrist.

Material & Methods: An 18-year-old right-handed female presented with a four-year history of ulnar-sided wrist pain and paraesthesia affecting the ring and small fingers. She denied previous trauma but engaged in sports involving repetitive wrist movement, such as taekwondo and horse riding. Examination revealed tenderness over the pisiform, pain exacerbated by flexion and ulnar deviation of the wrist, positive Tinel test proximal to Guyon's canal, and sensory disturbance in the ulnar collateral nerve's distribution, without motor weakness.

Radiographs revealed a unilateral congenital fusion between the pisiform and hamate bones. Computed tomography confirmed an incomplete coalition and an abnormal pisiform morphology, while magnetic resonance imaging demonstrated a fibrocartilaginous synchondrosis with degenerative changes and bone marrow oedema around the pisiform, with no evidence of carpal instability. An initial course of conservative management was undertaken, yet symptoms persisted. Surgical exploration was performed through a palmar ulnar approach, allowing radial mobilisation of the ulnar nerve and artery. The pisiform was detached from the flexor carpi ulnaris tendon by sharp subperiosteal dissection. Thin degenerated

cartilage with osteophyte formation at the pisotriquetral joint was observed. Excision of the coalition and the pisiform was performed. The ulnar nerve was dissected distally to rule out further compression, with careful identification of its branches. Postoperative immobilisation was maintained for three weeks.

Results: The postoperative course was uneventful. At five-year follow-up, the patient demonstrated complete resolution of pain and paraesthesias, full wrist motion, and return to pre-symptomatic activity levels. Histopathological analysis confirmed fibrocartilaginous tissue consistent with a synchondrosis-type coalition. The lesion was classified as a DeVilliers Minnaar Type I coalition, the subtype most frequently associated with symptomatic cases due to residual pseudoarthrotic motion and progressive degeneration.

Conclusions: Hamate–pisiform coalition, though uncommon, might present as a cause of ulnar nerve compression in young, active individuals presenting with chronic hypothenar pain and sensory symptoms. High-resolution imaging is helpful for diagnosis and surgical planning. When conservative treatment fails, surgical excision of the pisiform and the coalition might provide symptom resolution. This case constitutes, to our knowledge, the third documented case of ulnar neuropathy secondary to hamate–pisiform coalition, a rare diagnosis that should be kept in mind in the differential diagnosis of hypothenar pain.

A-0402 OUTCOME OF PROXIMAL POLE SCAPHOID FRACTURE NONUNION TREATED WITH DORSAL VASCULARIZED BONE GRAFT

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Background: Scaphoid proximal pole fracture nonunion poses significant clinical challenges related to its high rate of complications and technically difficult treatment options. Vascularized bone grafting has traditionally been reserved for revision surgery or cases with confirmed avascular necrosis. This study evaluated the long-term outcomes of a standardized primary surgical approach using dorsal vascularized bone grafting for proximal scaphoid nonunion.

Methods: A retrospective cohort study was conducted at a single tertiary medical center. Between 2013 and 2019, 28 patients with isolated proximal scaphoid nonunion were treated using a dorsal vascularized bone graft from the distal radius and screw fixation. Range of motion, radiographic and functional outcomes (the DASH questionnaire) were assessed before and after surgery.

Results: Eighteen patients completed the long-term follow-up at an average of 64 months postoperatively. Wrist flexion and extension improved by 11 and 15 degrees, respectively, while grip strength averaged 1.07 times the contralateral side. Residual deficits in extension and flexion compared to the uninjured wrist persisted. DASH scores improved on average by 18 points. Importantly, no patient required revision surgery for persistent nonunion or malunion. Seven patients underwent minor secondary procedures, almost exclusively for hardware removal, and 88% of the patients returned to their pre-injury jobs.

Conclusion: Primary dorsal vascularized bone grafting is a reproducible and effective treatment option for proximal scaphoid nonunion that eliminates the need for revision surgery for nonunion. These findings underscore the reproducibility and long-term success of this technique: the secondary procedures were limited to hardware-related issues rather than failure of union.

A-0403 THE IMPACT OF PARTICIPATION IN FLEXOR INJURY REHABILITATION SPLINT TRIAL (FIRST) ON CLINICAL PRACTICE AND RESEARCH CAPABILITY (I-FIRST)

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Introduction: The Flexor Injury Rehabilitation Splint Trial (FIRST) is a National Institute for Health and Care Research (NIHR) Health Technology Assessment (HTA) funded randomised control trial (RCT), involving 26 UK based hand centres and involves Allied Health Professions (AHPs), surgeons and nurses.

The wider impact of research participation in a national, multi-centre RCT on the capability and development of these professionals is still relatively underexplored. FIRST provided a unique opportunity to investigate how engagement and experiences in a large multicentred RCT influences clinical practice and research capacity among AHPs, surgeons and nurses working in hand centres – an area not previously studied.

Aim: The aim of iFIRST (impact of FIRST) was to evaluate the impact of participation in FIRST on clinical practice and research capacity in hand teams.

Material & Methods: The VICTOR (Visible the ImpaCT Of Research) tool has been specifically developed to demonstrate the impact of research in UK National Health Service organisations with focus on AHPs. The tool evaluates 6 domains of impact including (1) health benefits of participants; (2) service and workforce changes; (3) research profile and capacity; (4) economic benefit; (5) organisational influence; (6) knowledge production and exchange.

iFIRST used a mixed method approach of qualitative and quantitative data. An online cross-sectional survey, based on the VICTOR framework, was distributed to all individuals listed on the FIRST delegation logs across 26 centres. Additionally, 26 qualitative interviews were conducted (one per site) to gain a further understanding of the impact. Quantitative data from Likert-scale items were analysed descriptively in Excel using frequency statistics. Qualitative data from the open-ended questions and interviews were analysed using framework analysis, following the established five-step approach. **Results:** A total of 187 online questionnaires were submitted, with 133 complete entries suitable for inclusion. 61 participants consented to follow up interviews, representing a range of professional roles and sites. Purposeful sampling was employed, and 25 interviews were completed, capturing a range of roles, disciplines and demographics.

Reported benefits included improved patient care and outcomes, greater incorporation of evidence-based practice, and enhanced safety and governance through adherence to trial protocols. Organisational changes included new splinting practices and updating practice guidelines. Participants reported enhanced research skills, confidence and new collaborations. Overall, there was a strong positivity towards the opportunity provided, particularly valuing the therapy led nature of the trial. However, a lack of time was consistently identified as a barrier to research engagement, given the additional workload associated with participation alongside routine clinical duties. Participants also expressed reluctance to alter established practice until the formal publication of trial results, highlighting the ongoing tension between evidence generation and clinical implementation.

Conclusions: Participation in FIRST led to measurable improvements in both clinical practice and research capability, fostering individual and team upskilling as well as service-level change. Enhanced research confidence and competence highlighted the value of active research involvement. iFIRST successfully demonstrated how participation in a large-scale clinical trial can impact professional development, service delivery, and organisational culture — capturing both the benefits and challenges of integrating research into everyday clinical practice.

A-0404 SHIFTING THE BALANCE FROM STRUCTURAL TO FUNCTIONAL WORK – A SWISS APPROACH

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Introduction: Hand injuries represent one of the most frequent and costly work-related injuries. Data from the Austrian Accident Insurance (AUVA) show that approximately 38% of all occupational accidents involve the hand, generating substantial direct and long-term costs (Rauner, 2015). Given the structural similarities between the Swiss and Austrian labour markets, particularly the high share of manual work, Swiss accident patterns are likely to reflect a similarly high burden of hand injuries. In Switzerland, the typical post-injury pathway (accident – surgery – ambulatory rehabilitation – work trial) still prioritises structural healing and impairment-based therapy. For blue-collar workers with high physical job demands, a delayed transition to occupation-based rehabilitation may prolong recovery and increase indirect costs. A structured, biopsychosocial decision process could help to time the shift from structural to functional and work-related interventions more effectively.

Aim: (1) To describe a Swiss hand-injury care pathway with focus on return to work (RTW), (2) to identify key factors that positively or negatively influence RTW, and (3) to propose an interprofessional decision-making framework for balancing structural and functional goals.

Material & Methods: Following a hand-injury Patient in a collaboration between a specialised rehabilitation clinic and a university hospital the following aspects were reviewed: timing of transition from impairment based to occupation-based therapy, work demands, psychosocial barriers (MacDermid et al., 2007), use of work-hardening/FCE (Bieniek & Bethge, 2014), and RTW outcome. From recurring decision points, a pragmatic decision tree was developed, based on interprofessional check-points (physiotherapy and occupational therapy), biological healing phases (Wolf, 2020), psychosocial factors, and job demands.

Results: Early identification of job demands and psychosocial risks (such as fear of re-injury, low work self-efficacy, and job insecurity) facilitated the earlier introduction of occupation-based interventions including task simulation, graded work exposure, and workplace-oriented goal setting. These early functional interventions have the potential to shorten rehabilitation phases and enable earlier return-to-work trials. The proposed decision tree supports clinicians at four critical decision points: (1) structural readiness, (2) functional capacity for job-relevant tasks, (3) contextual and workplace feasibility, and (4) initiation of an RTW trial.

Conclusions: Balancing structure and function in postoperative hand rehabilitation is critical for sustainable RTW outcomes. Introducing a systematic decision-making framework enables interprofessional teams to determine when to shift from structural to functional, occupation-based rehabilitation.

This approach supports efficient resource allocation and enhances participation outcomes, particularly for blue-collar workers. Earlier occupation-based rehabilitation is not higher cost – it is higher value.

A-0405 P FRAME AS A HAND-MADE ADJUSTABLE EXTERNAL FIXATOR FOR TREATMENT OF COMPLEX SYNDACTYLY

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Introduction: Syndactyly is the most common congenital anomaly in hand. External fixator has been used for improving dressing of syndactyly or better management of syndactyly. We use an adjustable, hand-made external fixator (P Frame) in brachysyndactyly.

Aim: To evaluate the role of External fixator to make the syndactyly surgery easy, and its complications

Material & Methods: Patients with brachysyndactyly from Jan 2014 to Dec 2024 who has been undergone surgical release reviewed. P Frame is a connective hallow 2.5 mm tube with two vertical screws which stuck the pins within them after tightening the screws. After releasing the syndactyly, a longitudinal pin inserted in separated finger which cross at least one of the finger joints. Distal end of the pins was bent one centimeter far from fingertip and connected with the bent pin of the adjacent finger to made a P Frame. The frame was removed after 4 weeks. We reviewed inter and post-operative complications of our patients means, difficulty with suturing of the incisions and skin grafts, wound infection, pin tract infection, premature pin extrusion or breakage, satisfaction of the parents with respect to dressing, web creeping and operated fingers' range of motion.

Results: 41 web space in 28 patients in 33 operations were released with this technique. They were followed for one to six years (mean 34 months) The surgeons and surgeon assistants were satisfied with this technique (4.1/5). Wound infection appeared in 5 web space without skin graft loss and resolved with dressing. There were two pin tract infection and two pin migration and one fixator loosening. There were 4 web creeping. The parents were satisfied with changing dressing with P Frame (4.2/5). None of fingers showed deterioration of the range of motion.

Conclusions: we found better position holding by surgeon assistant with P frame intraoperatively. We had 6 complications related to external fixator and pins which did not affect the results of treatment. Wound infection and web creeping was compatible with literature. We found that insertion of P frame at least facilitates the operation issues and changing dressing without increasing the complications.

A-0406 ANATOMICAL FEASIBILITY OF FLEXOR CARPI ULNARIS MOTOR BRANCH TRANSFER TO THE ANTERIOR INTEROSSEOUS NERVE: A FRESH-FROZEN CADAVERIC STUDY WITH FUTURE IMPLICATIONS

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Introduction: Selective restoration of anterior interosseous nerve (AIN) function remains challenging after median nerve injury, and distal nerve transfers have been proposed to improve independent thumb and index flexion. Motor branches to the flexor carpi ulnaris (FCU) offer a potential donor option because they are purely motor, anatomically accessible, and typically present as more than one branch. However, reproducible morphometric data describing their number, course, diameter, and relationship to the AIN in fresh-frozen tissue are limited. A clearer anatomical definition is needed to determine whether this transfer can be reliably performed.

Aim: To quantitatively evaluate the anatomical feasibility of transferring an FCU motor branch to the AIN in fresh-frozen upper limbs, focusing on reproducibility of branch number, morphometric characteristics, and the potential to achieve tension-free coaptation.

Material and Methods: Twelve fresh-frozen upper limbs were dissected using a standardized volar approach. The medial epicondyle served as a fixed reference point. For each limb, the number of FCU motor branches, their distance from the medial epicondyle, diameters, and intramuscular penetration distances were measured with digital calipers. The origin of the AIN from the median nerve and its motor entry distances into the flexor pollicis longus and flexor digitorum profundus were recorded. Although a formal neurotomy was not performed in every specimen, all limbs were assessed

for the anatomical ability of at least one FCU branch to reach the AIN without tension or the need for an interposed graft. Results: A total of 24 FCU motor branches were identified, with a mean of 2.08 branches per limb (range 2–3). The proximal FCU branch originated 43.9 ± 21.8 mm distal to the medial epicondyle, had a mean diameter of 1.7 ± 0.9 mm, and entered the muscle 18.7 ± 7.4 mm distal to its origin. The AIN originated 86.6 ± 15.3 mm distal to the medial epicondyle and reached the flexor pollicis longus and flexor digitorum profundus at 36.9 ± 14.5 mm and 42.3 ± 31.4 mm, respectively. In every limb, at least one FCU branch demonstrated sufficient length and caliber to reach the AIN stump without tension, and none required theoretical graft interposition for coaptation.

Conclusions: Motor branches of the FCU are generally present in multiple branches and demonstrate adequate length and caliber to reach the AIN without tension, supporting the anatomical feasibility of FCU-to-AIN nerve transfer. With multiple donor branches typically available, intraoperative excitability provides an additional criterion for selecting the most appropriate FCU branch for transfer, complementing the anatomical feasibility demonstrated in this study.

A-0407 COMBINED VOLAR–DORSAL CORRECTIVE OSTEOTOMY FOR MALUNITED DISTAL RADIUS AFTER FAILED DUAL PLATING: 3D PLANNING AND RIM PLATE FIXATION

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Introduction: Distal radius malunion after multiple fixation failures presents a surgical challenge, particularly when associated with tendon irritation and joint incongruity. This report describes a complex case successfully managed using a combined volar–dorsal corrective osteotomy guided by three-dimensional (3D) preoperative planning.

Aim: A 34-year-old female presented three months after a second unsuccessful fixation of a left distal radius fracture. The first procedure, through a Henry volar approach, involved a plate placed too proximal to the watershed line, resulting in early loss of reduction. A second surgery employed volar and dorsal plates, both malpositioned, leading to dorsal displacement, intra-articular step-off at the lunate fossa, and synovitis of flexor and extensor tendons with De Quervain's syndrome. A new surgery was proposed, using a 3D-printing bone model to restore function and improve pain.

Material & Methods: A 3D-printed bone model enabled precise planning. Through combined volar and dorsal approaches, all implants were removed. Intra- and extra-articular osteotomies were performed to restore articular alignment and radial length. Fixation was achieved using a volar distal rim plate placed distal but within the watershed line, supplemented by a structural autologous iliac crest bone graft dorsally. Extensor tenolysis and synovectomy of the first compartment were performed.

Results: Postoperative radiographs showed anatomical restoration of volar tilt, radial height, and joint congruence. The patient achieved progressive functional recovery with complete resolution of tendon symptoms.

Conclusions: A combined volar–dorsal corrective osteotomy using 3D planning, rim plate fixation, and autologous iliac graft provides an effective strategy for complex distal radius malunions with prior failed volar and dorsal fixations.

A-0408 PHOTOBIMODULATION THERAPY IN ASSOCIATION WITH PHYSIOTHERAPY IN PATIENTS WITH LATERAL EPICONDYLITIS: A RANDOMIZED TRIAL

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Introduction: Lateral epicondylitis (LE) is a painful and disabling condition. It is considered self-limiting, but the symptoms make quality of life a challenge due to pain and functional limitation. Several therapeutic possibilities are recommended and used, including photobiomodulation (PBM). However, we found no studies that addressed higher doses of PBM in LE. **Aim:** to verify the effects of adding the use of PBM in doses higher than those indicated in the literature.

Material & Methods: 40 volunteers with LE were included and randomly divided into: Group-1: subjected to PBM with 32 Joules of energy, and Group-2: subjected to 160 Joules of energy. Both groups received therapeutic exercises for 8 weeks, totaling 16 sessions, and an evaluation after the 12th week of treatment (follow-up). A blinded evaluator applied the evaluation instruments on the 1st day of the intervention and in the 8th week of treatment. FBM was performed with e-light IRL equipment, with 4 infrared laser emitters and 4 red laser emitters. The pain-free grip test, EMG of the extensor carpi radialis brevis, and extensor digitorum communis during gripping on the dynamometer and maximum isometric wrist extension, and the scores of the DASH and PRTEE questionnaires were collected. The Mann-Whitney U test was used for comparison of mean scores between groups, and the Friedman test for comparisons within groups.

Results: In Group-1, 17 individuals completed the treatment and 12 responded to the follow-up. In Group-2, 14 individuals completed the treatment and 12 responded to the follow-up. It was observed that the right elbow was the most affected joint, in 85% of the cases. The average duration of symptoms was 5.91 months. The onset of symptoms was related to intense typing and beach tennis practice. A reduction in pain intensity was observed, more evident in Group 1, whose mean went from 3.95 ± 3.63 to 1.82 ± 2.51 , but without statistical significance. In the grip strength test, an increase in the activation signal of the common extensor muscle of the fingers was observed in both groups, while the short radial extensor muscle of the carpus showed no significant variation. The DASH scores showed a reduction after the intervention, indicating functional improvement in the participants. The greatest reduction was observed at follow-up, with emphasis on Group 1, which presented the best results. In the comparison between groups, both presented a statistically significant decrease in scores. The PRTEE scores also showed progressive functional improvement, with the greatest reduction in scores occurring at follow-up. Group 1 presented the best evolution, although Group 2 demonstrated a similar pattern of improvement. In the analysis between groups, both showed a statistically significant reduction in scores, with a slight inclination towards Group 1.

Conclusions: our study showed that the use of PBM in EL with doses of 32J and 160J is effective, showing significant results of improvement in the PRTEE and DASH indices. The 32J dose showed better results than the 160J dose, however, it can be considered safe and does not inhibit the improvement after its application.

A-0409 IDENTIFYING ERGONOMIC STRAIN IN HAND SURGERY: A MOTION CAPTURE STUDY OF OPEN CARPAL TUNNEL RELEASE

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Introduction: Surgeons experience musculoskeletal pain and dysfunction at rates above the general population. Approximately 60% of hand surgeons report work-related musculoskeletal injuries, with pain often exacerbated by operating. The routine use of loupe magnification further increases the risk of neck strain. Despite these known ergonomic risks, the postural demands of common procedures in hand surgery have not been objectively quantified in surgical practice. Open carpal tunnel release is one of the most commonly performed hand operations, making it an ideal procedure in which to assess operative posture. **Aim:** To objectively quantify surgeon posture and ergonomic risk during open carpal tunnel release procedures using wearable motion capture sensors. **Material & Methods:** Data were collected from three consultant plastic surgeons while performing open carpal tunnel release, using a 17-sensor motion capture system (Xsens Awinda, Movella) worn beneath standard surgical gowns. Following calibration, motion capture began at skin incision and concluded at skin closure. Kinematic data were processed in Xsens Analyze (v2025.0), and joint angles were exported and analysed in R (v4.5.1). Head inclination, neck flexion, trunk flexion or inclination, pelvic contribution to forward lean and shoulder elevation were derived from segmental joint angles. Postures were classified as non-neutral ($>20^\circ$) and high-flexion ($>45^\circ$) according to ISO 11226 criteria. For each procedure, percentage of operative time in non-neutral positions, median and 95th percentile angles (P95) and static hold durations were calculated. **Results:** A total of 22 carpal tunnel releases were recorded across three consultant plastic surgeons. All procedures were performed seated, wearing loupes, with a median procedure duration of 13.8 min (range 5.6 – 34.8 min). Surgeons spent a substantial proportion of operative time in forward head posture, with head inclination $>20^\circ$ for 77.6% of operative time and $>45^\circ$ for 12.7% of time. Trunk flexion was in excess of 20° for 29.8% of surgical time. Median head inclination was 29.3° and (P95 = 49.7°), and median neck flexion was 14.1° (P95 = 38.6°). Analysis of forward-lean strategy demonstrated a mixed pelvic-spinal control pattern. The median pelvic contribution to forward lean was 0.57 (IQR 0.45), meaning the surgeons achieved approximately half of their forward lean through hip flexion, and the other half through thoracolumbar flexion. Surgeons spent 34.7% of time in a spine dominant posture, relying on thoracolumbar flexion. **Conclusions:** These findings demonstrate that seated open carpal tunnel release is associated with prolonged forward head inclination and non-neutral trunk posture for the operating surgeon. The frequent use of spine dominant posture to achieve forward lean, accompanied by sustained neck flexion, may contribute to increased load. This offers an explanation for the reported neck and back discomfort in hand surgeons, highlighting the need for ergonomic interventions.

A-0411 ULTRASOUND IMAGE FOR THERAPISTS: WHAT SHOULD WE LOOK FOR IN TENDINOPATHY SYMPTOMS OF THE UPPER LIMB?

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Introduction: This lecture was given at the 2025 IFSSH/IFSHT in Washington, DC, where the importance of using ultrasonography in therapy was elucidated, whether it is for a tendon re-rupture or adhesion diagnose during hand

therapy evaluation, rehabilitation of upper limb tendinopathies or the use for guided procedures such as percutaneous electrolysis, dry needling or shock wave therapy.

Aim: To show all the therapists at the congress the possibilities and advantages of using ultrasound image at their practice of upper limb rehabilitation, since it is noninvasive, no radiative, it's ready to be used, good cost-effectiveness and allows dynamic examination (tendon sliding, tendon tears, tendinitis,...) and side to side comparisons.

Material & Methods: -

Results: -

Conclusions: Future research should focus on elucidating the key functional pathways implicated in clinical disease and on improved rehabilitation protocols, and that's why we need ultrasound in therapy.

A-0412 ANALYSIS OF UNION-RATE AND RADIOLOGICAL CORRECTION AFTER ARTHROSCOPIC TREATMENT OF SCAPHOID NON-UNION WITH NON-VASCULARISED BONE GRAFTS

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Introduction: Connecting the proximal and distal carpal rows, the scaphoid plays a key role in wrist biomechanics. Its anatomical position makes it prone to fractures from hyperextension and supination trauma, accounting for up to 70% of all carpal fractures. Due to its predominantly cartilaginous surface and retrograde blood supply, the scaphoid is particularly susceptible to non-union, with rates increasing in more proximally located fractures. Instability of mid-waist fractures can lead to a characteristic “humpback” deformity, which may disrupt carpal kinematics. Radiographic evaluation of this deformity includes the lateral intrascaphoid angle and height-to-length ratio, while scapholunate and radiolunate angles assess carpal alignment. Although open grafting techniques yield union rates up to 92%, recent developments in wrist arthroscopy offer a less invasive alternative, aiming to preserve vascularity and ligamentous integrity. This study aims to assess the union rate and radiological correction achieved through arthroscopic treatment of scaphoid non-unions with non-vascularised bone grafts.
Material & Methods: This retrospective analysis included patients treated for scaphoid non-union between 2015 and 2025 at a specialized orthopedic center. All underwent arthroscopic bone grafting by one of three experienced orthopedic surgeons. Fractures were classified using the Mayo classification ; non-unions were categorized by Schernberg system and Slade and Dodds criteria. Bone healing was assessed using Cone-Beam Computed Tomography, anteroposterior and lateral radiographic views. Radiographic parameters assessed included the carpal height ratio (Nattrass method), scapholunate and radiolunate angles, as well as the lateral intrascaphoid angle and scaphoid height-to-length ratio based on 2D Computed Tomography reconstructions. All images were aligned along the scaphoid axis and independently evaluated. Data were anonymized and analyzed using Excel-based statistical tools.
Results: A total of 28 patients were included in the study, comprising 4 women and 24 men, with a mean age of 30 years. Among this cohort, 5 patients (20,83%) were smokers, and 19 patients (67,9%) sustained a scaphoid fracture in their dominant hand. The mean follow-up duration was 8.54 months.

Radiological union was achieved in 26 out of 28 patients (92,9%), while 2 patients showed radiographic evidence of non-union at six months. The average time to union was 9.5 weeks, and the mean time to return to work/sport was 2.56 months. A statistically significant change was observed in the scapholunate angle ($p=0.016$). In contrast, no significant changes were noted in the radiolunate angle and carpal height (Nattrass method). Cone-Beam Computed Tomography analysis demonstrated a statistically significant alteration in the lateral intrascaphoid angle ($p<0.001$). In contrast, no significant differences were identified in the height-to-length ratio.
Conclusions: Arthroscopically assisted treatment of

scaphoid non-union using non-vascularized bone grafts appears to be a promising technique, demonstrating union rates comparable to those reported for open surgical approaches with non-vascularised bone grafts. Postoperative radiographic analysis revealed a statistically significant change in the scapholunate angle and lateral intrascaphoid angle. However, further research is needed to clarify the clinical relevance of this radiographic correction and to evaluate its long-term impact on carpal alignment and joint integrity.

A-0413 COMPARISON OF OPEN AND ARTHROSCOPIC SCAPHOCAPITATE FUSION OUTCOMES IN KIENBÖCK'S DISEASE Ebubekir Eravsar¹, Ali Ozdemir¹, Mehmet Ali Acar²

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Introduction: Kienböck's disease, resulting from avascular necrosis of the lunate, can lead to significant functional impairment and pain. A wide range of treatment options exists, ranging from conservative methods to various surgical techniques. Scaphocapitate fusion is one of the key surgical treatments for this condition. Wrist arthroscopy provides a minimally invasive approach for the diagnosis and treatment of wrist disorders. It is believed to cause less iatrogenic damage to surrounding ligaments, blood vessels, and nerves compared to open surgery, and its popularity is increasing. **Aim:** This study aimed to compare the outcomes of open scaphocapitate fusion versus arthroscopic scaphocapitate fusion in patients with Kienböck's disease.

Material & Methods: The study included 12 patients who underwent arthroscopic scaphocapitate fusion and 13 patients who underwent open scaphocapitate fusion for Kienböck's disease. Patient data were collected from hospital records and clinical archives. Demographic data and preoperative and postoperative imaging were evaluated. Functional outcomes were assessed using postoperative follow-up measurements, including the Mayo Wrist Score, Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) score, and Visual Analog Scale (VAS) score. Additionally, the ratios of flexion-extension and radial-ulnar deviation range of motion, as well as grip strength compared to the contralateral side, were compared between groups. Statistical analysis was performed using the Mann-Whitney U test.

Results: The mean age was 31.8 ± 5.9 years in the open group and 30.0 ± 6.5 years in the arthroscopic group. The mean follow-up duration was 35 months for the open group and 18 months for the arthroscopic group. No statistically significant differences were found between the groups in terms of grip strength ratio ($p=0.769$), flexion-extension ratio ($p=0.650$), or radial-ulnar deviation ratio ($p=0.270$). Likewise, there were no significant differences in the Mayo Wrist Score ($p=0.810$), QuickDASH score ($p=0.689$), or VAS score ($p=0.852$) between groups.

Conclusions: Arthroscopic techniques, increasingly popular in wrist surgery, can also be used for scaphocapitate fusion in Kienböck's disease. As a minimally invasive method, it may theoretically cause less tissue damage, potentially providing advantages in pain, function, grip strength, and range of motion compared to open surgery. However, this study demonstrated that there is no significant difference between open and arthroscopic scaphocapitate fusion in terms of pain, function, grip strength, or range of motion. Therefore, surgical technique selection should be based on individual patient characteristics, surgeon experience, and available equipment. Further studies with larger patient groups and long-term follow-up are needed to better elucidate the long-term efficacy of the arthroscopic approach.

A-0414 PROPRIOCEPTIVE REHABILITATION IN CONSERVATIVE MANAGEMENT OF THUMB CARPOMETACARPAL OSTEOARTHRITIS IN ADULTS

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Introduction: The thumb plays an important role in the overall function of the hand, due to its ability to oppose the long fingers, which is essential for grasping, pinching, and fine manipulation. Rhizarthrosis of the thumb, or trapeziometacarpal osteoarthritis, is a common degenerative condition that particularly affects women over the age of 50. It results from a progressive imbalance between mobility and stability within the trapeziometacarpal joint and leads to biomechanical and sensorimotor changes. This imbalance causes decreased joint stability, chronic pain, and decreased strength, which directly impair the overall function of the hand and occupational performance. Conservative rehabilitation aims to relieve these symptoms and preserve manual function. The integration of proprioceptive exercises into conservative rehabilitation is one of the recent strategies that aim to restore this balance by re-educating perception, motor control, and joint stability.

Aim: Evaluate the effects of adding proprioceptive exercises to standard conservative treatment in patients with early-stage thumb rhizarthrosis and illustrate how this approach helps restore functional balance to the thumb.

Material & Methods: A narrative review of the literature was conducted following PRISMA recommendations. Four randomized controlled trials published between 2022 and 2024 were included. Participants with Eaton-Littler stage I to III rhizarthrosis were divided into a control group receiving standard conservative treatment (orthosis, gentle mobilizations, muscle strengthening, and joint protection) and an experimental group that additionally performed proprioceptive exercises. These programs involved a progressive approach, from passive joint perception to functional integration in daily activities, aiming to improve sensorimotor control and dynamic stability. Data regarding pain (VAS), joint position sense (JPS), and functional outcomes (Quick-DASH, COPM) were analyzed across studies to determine the added value of proprioceptive training.

Results: All four studies show a significant reduction in pain (VAS), improvement in joint perception (JPS) and function (Quick-DASH, COPM), as well as better short-term motor control for the experimental groups. Participants who followed proprioceptive exercise programs also showed better short-term motor control and dynamic thumb stability compared to those receiving standard treatment alone. The protocols consistently aimed to restore sensorimotor balance of the thumb through a gradual progression from passive perception to active and functional integration.

Conclusions: Overall, the integration of proprioceptive exercises within conservative management appears to optimize hand function, reduce pain, and enhance the quality of manual performance in daily activities, suggesting promising potential for improving patients' quality of life. Further studies, including long-term follow-ups, would be necessary to consolidate these results and standardize protocols.

A-0415 EXTRA-DISTAL RADIUS PLATES, WHICH MODEL SHOULD I CHOOSE?

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Introduction: Numerous models of extra-distal volar plates for the distal radius exist, differing considerably in design. Our objective was to determine which plate model extends the least beyond the watershed line—both anteriorly and distally—while remaining closest to the joint surface.

Methods: We compared the positioning characteristics of five extra-distal plates: Medartis FPL®, Medartis Trilock®, Synthes LCP Volar Rim®, Newclip Technics Volar Rim®, and Stryker Volar Rim®. Each plate was applied to 3D-printed models of ten native radii obtained from ten patients without prior trauma. For each plate, CT scans were used to measure the anterior protrusion beyond the watershed line, the distance to the joint surface, and the Soong index in three radial zones (radial, intermediate, and ulnar).

Results: The Medartis FPL® and Medartis Babyfoot® plates showed significantly less anterior overhang than the Synthes® ($p<0.01$), Newclip Technics® ($p<0.01$), and Stryker® plates ($p=0.01$ and $p=0.03$). The Stryker® plate was positioned more distally than the Synthes® plate (0.8 mm vs. 2.3 mm, $p=0.04$). The Synthes® plate was more distal than the Newclip Technics® (4.6 mm, $p<0.01$), which was itself more distal than the Medartis Babyfoot® (6.1 mm, $p<0.01$), which in turn was more distal than the Medartis FPL® (11 mm, $p=0.05$). The mean Soong index was higher with the Synthes® plate than with the Newclip Technics® ($p=0.01$), which itself exceeded that of the Medartis Babyfoot® ($p=0.01$) and Medartis FPL® ($p<0.01$). The Stryker® plate showed a higher Soong index than the Newclip Technics® ($p<0.01$), Medartis Trilock® ($p<0.01$), and Medartis FPL® ($p<0.01$) in the radial zone. No screws were found to penetrate the joint surface.

Discussion: The Medartis FPL® plate may reduce the risk of flexor tendon irritation due to its minimal anterior overhang and low Soong index, though its greater distance from the joint may limit its ability to stabilize very distal fractures. Conversely, the Synthes®, Newclip Technics®, and Stryker® plates provide excellent distal fixation but may increase the risk of tendon conflict. The Medartis Trilock® plate appears to represent an intermediate option.

Conclusion: The positioning of extra-distal radius plates represents a balance between flexor tendon safety and distal fragment fixation. Plate selection should be adapted to patient morphology and fracture pattern. Future implant designs may benefit from a modular or patient-specific approach.

A-0416 AN INTERDISCIPLINARY DELPHI STUDY TO CONDUCT A DIAGNOSTIC PATHWAY TO DETECT AMYLOIDOSIS IN CARPAL TUNNEL SYNDROME PATIENTS

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Introduction: 60% of patients who develop cardiac amyloidosis have carpal tunnel syndrome requiring surgery 5-9 years prior to diagnosis. The median survival rate after diagnosis of cardiac amyloidosis is currently 2-3 years. Given that the median survival after diagnosis of cardiac amyloidosis remains only 2-3 years, earlier detection is critical. However, there are currently no consensus recommendations on screening CTS patients for amyloid deposits. The inclusion criteria for histological diagnosis are not defined, and the referral of patients to cardiology for further treatment is not standardised. Moreover, in cases with positive histology, the optimal frequency and modalities of cardiologic follow-up as well as the timing for initiating transthyretin-stabilizing therapy (e.g., tafamidis) remain unclear. Beyond the scientific level, health economic considerations regarding the costs of histological diagnosis and the currently very high costs of therapy must be considered.

Aim: This study aimed to establish an interdisciplinary consensus on a diagnostic and management pathway for CTS patients to facilitate early detection and preventive treatment of amyloidosis before the onset of cardiac manifestations.

Material & Methods: A Delphi process was conducted involving experts in hand surgery, pathology, cardiology, hematology, and neurology. The questionnaires were developed by the professional associations to clarify details of patient management. After a cross-disciplinary literature review to examine ongoing research, expert groups from the individual specialist areas were appointed. These groups were surveyed using a questionnaire in two rounds. In the

second round, respondents were presented with anonymized results and comments from the first round to refine their responses. Key topics included inclusion and exclusion criteria for histologic screening, diagnostic algorithms, referral strategies, follow-up protocols, and therapeutic management after a positive biopsy.

Results: We constructed a consensus paper that outlines the diagnostic and therapeutic pathway for patients from their initial presentation in hand surgery to their referral to an amyloidosis centre, including the follow-up screening. This will serve as the basis for a prospective interdisciplinary long-term study. A joint registry is in discussion.

Conclusion: Hand surgery is an important pillar of early detection for the prevention of manifest cardiac amyloidosis. This interdisciplinary Delphi consensus represents an essential first step toward a standardized diagnostic pathway enabling timely identification and preventive treatment of cardiac amyloidosis. We hope to gain further insights through the interdisciplinary collaboration that has been initiated.

A-0417 EFFECTIVENESS OF ULNAR TRAPEZIAL OSTEOPHYTE RESECTION COMBINED WITH ARTHROSCOPY-ASSISTED ABDUCTING–OPPOSING METACARPAL OSTEOTOMY FOR EARLY THUMB CMC ARTHRITIS

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Introduction: We have previously reported favorable outcomes using arthroscopy-assisted synovectomy combined with abducting–opposing metacarpal osteotomy (AO osteotomy) for early thumb carpometacarpal (CMC) arthritis, resulting in pain relief and improved joint congruity. However, in cases with an ulnar trapezial osteophyte, the osteophyte may mechanically block reduction of subluxation. To enhance reduction and joint stability, we recently added a limited resection of the ulnar trapezial osteophyte through a small incision using the ulnar arthroscopic portal. The clinical significance of this additional procedure has not been well documented.

Aim: To evaluate the clinical and radiological outcomes of additional ulnar trapezial osteophyte resection in arthroscopy-assisted AO osteotomy for early thumb CMC arthritis.

Material & Methods: Among 43 patients who underwent arthroscopy-assisted synovectomy and AO osteotomy between 2022 and 2024 with at least 12 months of follow-up, 16 cases with osteophyte resection were analyzed. Patients were divided into two groups: those who underwent osteophyte resection during the initial surgery (F group, n=10; 2 males, 8 females) and those who underwent resection during arthroscopic screw removal one year postoperatively (S group, n=6; all females). The mean ages were 58.0 and 54.3 years, respectively. According to Eaton classification, stage II/III was 2/8 in the F group and 1/5 in the S group. Preoperative subluxation ratios (Aoyama method) were 23.7% vs 18.8% (AP view), 39.9% vs 39.3% (lateral X-ray), and 46.0% vs 46.9% (CT). Osteophyte size (vertical × horizontal) averaged 3.9×4.2 mm in the F group and 6.3×5.3 mm in the S group. Radiographic and clinical outcomes at 12 months and postoperative complications were compared.

Results: Bone union was achieved in all cases. At 12 months, the subluxation ratio was significantly lower in the F group on lateral CT (15.8% vs 38.0%, $p<0.05$), whereas differences in AP view (6.6% vs 11.1%) and lateral X-ray (15.5% vs 25.0%) were not significant. Both groups showed significant improvements in pain (VAS), grip strength, pinch strength, and DASH scores, with no intergroup differences. Arthroscopic findings revealed grade 4 cartilage degeneration (ICRS) in all cases initially; however, partial cartilage regeneration was observed at screw removal, with improvement to grade 2 or 3 in 80% of the F group and 40% of the S group. No major complications were observed.

Conclusions: Addition of ulnar trapezial osteophyte resection to arthroscopy-assisted AO osteotomy enhanced reduction of CMC subluxation, particularly in the lateral plane, without increasing complications. This adjunctive technique appears to improve joint stability and may contribute to cartilage preservation in early thumb CMC arthritis

A-0418 RESTORING DISTAL RADIOULNAR BALANCE WITH A BONE-TUNNEL–FREE HEMI-ECU TENDON "TURN AROUND" LIGAMENOTPLASTY

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Introduction: Chronic distal radioulnar joint (DRUJ) instability disrupts forearm rotation and wrist function, often causing pain and functional limitation. Existing surgical techniques frequently require bone tunnels or implants, which can increase complexity and complications. A simple, anatomy-preserving method is needed to reliably restore DRUJ stability
Aim: . This study presents a simple, bone-tunnel–free soft tissue reconstruction using a hemi–extensor carpi ulnaris (ECU) tendon graft to restore DRUJ stability and balance.

Material & Methods: 12 patients (8 males, 4 females; mean age 36 years) with chronic post-traumatic DRUJ instability were treated between 2021 and 2024. The distally based ulnar half of the ECU tendon was looped around the ulnar styloid through a soft tissue tunnel and sutured to itself in neutral rotation, without any bone tunnel or implant fixation. Clinical, functional, and radiographic outcomes were evaluated pre- and postoperatively using VAS, grip strength, Mayo Wrist Score (MWS), QuickDASH, and DRUJ stability tests. Mean follow-up was 18 months.

Results: All patients achieved significant pain relief and improved stability. Mean VAS decreased from 7.1 to 1.8, MWS improved from 53 to 84, QuickDASH from 46 to 14, and grip strength increased from 61% to 89% of the contralateral side. The forearm rotation arc improved from 118° to 152°. Radiographs confirmed stable DRUJ alignment, with no recurrence or complications

Conclusions: This bone-tunnel–free hemi-ECU tendon reconstruction is a straightforward, reliable, and anatomy-preserving technique that effectively restores distal radioulnar balance. It minimizes complications, shortens operative time, and promotes mechanical and functional balance in wrist surgery

A-0419 ARTHROSCOPIC-ASSISTED SCAPHOID NONUNION RECONSTRUCTION WITH OLECRANON AUTOGRAFT: ACHIEVING BALANCE BETWEEN STABILITY, MOTION, AND BIOLOGICAL HEALING

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Introduction: Scaphoid fractures are prone to nonunion due to limited vascularity and biomechanical stress, often leading to chronic pain and wrist dysfunction if left untreated. Traditional open techniques for scaphoid nonunion often require extensive dissection, which can compromise soft tissues, delay rehabilitation, and increase the risk of complications. Arthroscopic-assisted reconstruction offers a minimally invasive approach to restore stability while preserving joint mobility and soft-tissue integrity.

Aim: To evaluate the outcomes of an arthroscopic-assisted scaphoid nonunion reconstruction technique using olecranon cancellous autograft, designed to restore biomechanical stability while maintaining joint mobility and biological vitality—a balanced approach in wrist reconstruction.

Material & Methods: Between 2016 and 2024, 28 patients with scaphoid nonunion were treated arthroscopically. Standard 3–4, 4–5, and midcarpal portals were used for cartilage and ligament assessment, nonunion mobility testing, and debridement to healthy cancellous bone. Olecranon cancellous autograft was harvested and introduced through the midcarpal portal. Fixation was achieved percutaneously with K-wires under both arthroscopic and fluoroscopic guidance. Postoperative assessments included radiographic parameters (union rate, scapholunate angle, carpal height ratio), functional outcomes (ROM, grip strength, Mayo Wrist Score, QuickDASH), and donor-site morbidity.

Results: Bony union was achieved in 40 of 42 patients (95.2%) at a mean of 9.2 weeks postoperatively. Two patients developed nonunion and required revision surgery, after which union was successfully obtained. Mean scapholunate angle improved from 69° to 54°, and carpal height ratio was restored to 0.53. Average wrist motion arc increased from 64° to 108° ($p < 0.001$), grip strength reached 89% of the contralateral side, and mean QuickDASH score was 11.2. No graft-site complications or fixation failures occurred.

Conclusions: This arthroscopic-assisted technique achieves a functional and biological balance—providing sufficient mechanical stability for union while preserving soft-tissue integrity and early motion. By integrating minimal invasiveness with precise visualization, it redefines equilibrium between fixation, mobility, and biological healing in scaphoid nonunion management.

A-0420 HYDRODISSECTION IN CTS - MIRAGE OF EFFECTIVENESS

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Introduction: Carpal tunnel syndrome (CTS) is the most well-known and frequent form of median nerve neuropathy and accounts for 90% of all neuropathies. CTS is caused by a combination of the compression and traction of the median nerve in the carpal tunnel. Understanding of the pathophysiology the complex of the carpal ligament (TCL) overgrowth, increased carpal tunnel pressure and chronic nerve microcirculation injury is crucial for choice of the proper treatment. Although surgical treatment - transecting of TCL is common used as the most effective, several conservative methods with various and anecdotal effectiveness are offered as alternative. Over the last years hydrodissection (HD) has attracted increasing popularity because it offers non-invasive treatment tempting for some patients.

Aim: Critical evaluation of the HD method based on literature and cadaver study

Material & Methods: HD is USG-guided injection of fluids like normal saline, corticosteroids, local anaesthetics, dextrose and platelet-rich plasma in the treatment of CTS. Several publications presenting effectiveness of this procedure using various injectates were published. Results reported in these studies show generally good results after HD in terms of pain relief and even improvement of EMG parameters. Unfortunately almost all studies are limited to mild to moderate CTS and presented only short time results. None of them explains the essence of the mechanical effect responsible for the success despite leaving all structures in the carpal tunnel unchanged and intra tunnel pressure on the nerve as well. Beneficial effect of this treatment is probably limited to a pharmacological effect of delivered drug temporary relieving pain. However HD is tempting for the “non-operating” surgeons, physiotherapists and patients, it’s value has not been scientifically verified and not provides a permanent recovery.

Results: The authors conducted balloon studies on cadavers, which clearly showed that the widening of the canal by stretching the TCL requires extremely high pressures that cannot be generated under injection conditions. Additionally

first author treated operatively 7 cases of postHD CTS during last year successfully, all patients underwent HD up to 6 month before surgery, all reported recurrence of symptoms, some with worsening, in period from 0 to 3 month. Conclusions: Admittedly the experience of the authors is limited, but analysis of potential influence of the HD on etiology of the CTS and the results of the literature review are not justifying consideration of the HD to CTS surgery as alternative.

A-0421 EPIDERMOLYSIS BULLOSA- DYNAMIC SPLINTING - CASE STUDY

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Introduction: Recessive dystrophic epidermolysis bullosa (EB) is a rare congenital disease caused by mutation of gene that codes collagen VII. Disorders of the skin and mucous membranes affect all parts of the body. Frequent hands involvement is characterized by pseudosyndactyly (PS), fingers and hand contractures creating “mitten” or “cocoon” deformity. Advanced stages require surgical management. Procedures like PS release, flexor tendon elongation, stiff joints correction are relatively easy but complicated by fragile, blistering skin and fibrotic scars formation and recurrences. Additionally skin grafts are poor quality or more often impossible.

Material & Methods: Authors present a case of 5 y. old boy successfully treated due to severe EB PS in the form of cocoon deformity by modified method of Pajardi combining web spaces and fingers release with dynamic splinting and “en masse” fat cover without dressing.

Results and conclusions: Dynamic skeletal traction with a non-dressing fat immersion method allowed for an unexpectedly large range of finger movement and the recovery of normal hand function.

A-0422 REHABILITATION PROTOCOL FOLLOWING OPEN TFCC RECONSTRUCTION

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Introduction: The triangular fibrocartilage complex (TFCC) plays a key role in wrist stability and function. TFCC injuries are a common cause of ulnar-sided wrist pain and distal radioulnar joint (DRUJ) instability. This study evaluates the outcomes of open surgical repair of TFCC injuries, the applied rehabilitation protocol, and functional recovery over a period of 6–18 months postoperatively. The protocol is the result of our clinical experience with patients treated in a plastic and hand surgery department.

Aim: To present and discuss the rehabilitation protocol used in patients following open TFCC reconstruction, and to report the functional outcomes achieved.

Material & Methods: A total of 17 patients (10 men and 7 women; mean age: 39.9 years) were included in the study. All participants underwent open TFCC reconstruction between February 2022 and December 2023. Postoperatively, immobilization was maintained for six weeks: three weeks in forced forearm supination, followed by three weeks of wrist immobilization in a neutral position. Hand rehabilitation began around the 7th postoperative week, following our protocol based primarily on active, passive, and functional exercises supported by physical therapy. Some patients did not attend, or attended only limited rehabilitation sessions in medical facilities. Instead, they followed the prescribed

exercises independently at home according to our protocol. Despite limited access to formal therapy, these patients achieved good functional outcomes.

Results: The average DASH score was 14.69, and grip strength reached 92.38% of the contralateral hand. All patients returned to work within 10.2 weeks and resumed amateur sports activities after 12.3 weeks. No complications or reoperations were reported. The procedure significantly improved grip strength and range of motion.

Conclusions: Open TFCC repair is an effective and safe treatment method. When combined with an appropriate hand rehabilitation protocol, it provides favorable functional outcomes and can be successfully implemented in most rehabilitation departments and clinics. Moreover, the rehabilitation protocol itself may serve as valuable guidance for patients with limited access to formal rehabilitation services — a challenge increasingly common in today's healthcare systems.

A-0423 AN ACCURATE HISTORY OF THE AXIAL PATTERN FLAP

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Introduction: As 20th Century philosopher George Santayana warned, “Those who cannot remember the past are condemned to repeat it.” In the fields of plastic and hand surgery, the origin of the axial pattern flap is frequently credited to Jackson and McGregor’s seminal 1972 description of the groin flap for upper extremity reconstruction. However, emerging evidence suggests that this widely taught historical narrative is incomplete. Early 20th-century textbooks and several non-English publications describe flaps that clearly meet Jackson and McGregor’s own definition of axial pattern flaps, i.e. single-pedicled flaps incorporating a defined arterio-venous system running along their long axis, decades before their landmark paper.

Aim: To reconstruct an accurate and comprehensive history of axial pattern flaps, with particular focus on the evolution of the groin flap.

Material & Methods: Extensive literature searches were performed with assistance from medical librarians at two institutions. Additional publications were identified through reference tracing. Primary texts from the mid-19th century to the 1970s, including both English-language and foreign-language sources, were analyzed. Only publications in which authors intentionally designed flaps around recognized vascular anatomy to enhance flap survival were included. A chronological framework was created to map key advances in axial flap design.

Results: Historical analysis revealed that axial pattern flap design long predates its commonly cited origins. Between 1863 and 1869 – over a century before Jackson and McGregor – John Wood published 3 papers describing groin flaps deliberately based on the superficial inferior epigastric vessels and used for hand and abdominal wall reconstruction. By the 1890s, several surgeons were designing head and neck flaps based on the superficial temporal artery. In the early 20th century, Gillies, Esser, and contemporaries produced extensive work on anatomically patterned flaps, reflecting a rapidly advancing understanding of vascular-based flap design. This review analyses more than 70 relevant publications (1863–1973), highlighting pivotal contributions from both well-known and historically overlooked authors. Although the evolution of axial pattern flaps is complex and often controversial, the literature demonstrates unequivocally that the principles of axial flap design were well established long before 1972.

Conclusions: Axial pattern flaps did not originate in the 1970s, they were rediscovered. By clarifying the true historical lineage of axial flap innovation, this work aims to restore long-overlooked surgical contributions and correct a persistent misconception in plastic surgery education.

A-0424 RESTORING DEVELOPMENTAL BALANCE: IMPACT OF EARLY SURGICAL TIMING ON FUNCTIONAL OUTCOMES IN RADIAL CLUB HAND (BAYNE–KLUG TYPE IIIB/IV)

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Introduction: Radial club hand represents a spectrum of congenital radial longitudinal deficiencies characterized by radial deviation of the wrist and varying degrees of radial bone hypoplasia or absence. Despite advances in early conservative and surgical management, the optimal timing of operative correction remains unresolved

Aim: This study aimed to evaluate how the timing of surgical correction influences the restoration of this developmental and functional balance in Bayne–Klug type IIIB and IV deformities.

Material & Methods: A retrospective analysis was conducted on 22 patients (34 hands) who underwent centralization or radialization before 10 months of age, following structured early rehabilitation and splinting. Preoperative and postoperative radiographic alignment (hand–forearm angulation) and functional outcomes (flexion, extension, radial and ulnar deviation) were recorded. Minimum follow-up was 2 years

Results: The mean preoperative hand–forearm angulation was 86.8° (range, 20°–150°), improving to 3.8° (range, 0°–20°) postoperatively—a mean correction of 82.9°. Final follow-up revealed average wrist flexion of 84.3°, extension of 65.7°, ulnar deviation of 35.6°, and radial deviation of 17.4°. Minor complications included superficial skin necrosis in 3 hands (9%), with no recurrence of radial deviation

Conclusions: Early, well-timed surgical intervention—integrated with neonatal splinting and therapy—supports not only anatomical alignment but also the restoration of dynamic balance across the wrist and forearm. By harmonizing skeletal correction with soft-tissue adaptation, early surgery before 10 months of age optimizes long-term motion and functional symmetry in severe radial club hand

A-0425 RESTORING FUNCTIONAL BALANCE IN CEREBRAL PALSY: OUTCOMES OF HYPERSELECTIVE NEURECTOMY FOR LOWER LIMB SPASTICITY

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Introduction: Lower limb spasticity in cerebral palsy disrupts the neuromuscular balance required for efficient gait and posture, leading to progressive functional limitations. Hyperselective neurectomy (HSN) seeks to restore this balance by selectively reducing pathological motor input while preserving voluntary control. This study evaluates the effectiveness and safety of HSN in re-establishing functional equilibrium and improving lower limb performance in children with cerebral palsy

Aim: . This study evaluates the functional outcomes and safety of HSN in managing lower limb spasticity.

Material & Methods: Between January 2023 and January 2025, 15 patients (9 males, 6females; mean age 8.8 years) with lower limb spasticity secondary to cerebral palsy underwent hyperselective neurectomy targeting tibial, obturator, and femoral nerve branches based on clinical spasticity patterns. Pre- and postoperative assessments included the Modified Ashworth Scale (MAS), Gross Motor Function Classification System (GMFCS), gait kinematics, and caregiver-reported ease of daily care. Mean follow-up was 19 months

Results: Mean MAS improved from 3.8 ± 0.4 to 1.6 ± 0.5 ($p < 0.001$). Gait analysis showed increased step length (mean + 19%) and improved knee extension at terminal stance (mean + 14°). GMFCS level improved by at least one grade in

4 patients (50%). No cases of sensory deficit, infection, or excessive weakness were reported. Transient fatigue in the operated limb resolved spontaneously within 6 weeks

Conclusions: Hyperselective neurectomy effectively restores dynamic balance between muscle tone and motor control in cerebral palsy–related lower limb spasticity. By harmonizing selective denervation with preserved voluntary movement, it enhances gait efficiency, stability, and overall functional participation

A-0426 RESTORING CARPAL BALANCE: EARLY CLINICAL OUTCOMES OF THE “HAMMOCK TECHNIQUE” FOR MIDCARPAL INSTABILITY

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Introduction: Midcarpal instability (MCI) is an uncommon yet disabling wrist condition characterized by pain, weakness, and reduced grip strength. Although several surgical options exist, none simultaneously address dorsal and palmar components of instability through a purely soft-tissue–based approach. To address this gap, we developed the Hammock Technique, a novel tendon-sling method that restores midcarpal balance without the use of bone tunnels, anchors, or hardware.

Aim: To describe the Hammock Technique and evaluate its early clinical and radiologic outcomes in patients with mild to moderate, reducible MCI.

Material & Methods: Eight patients with symptomatic, reducible MCI underwent surgical treatment using the Hammock Technique between 2022 and 2025. The palmaris longus tendon was woven through the capsule to provide a triple stabilizing effect: reinforcement of dorsal ligaments, hammock-like support for the proximal capitate, and stabilization of the distal pole of the scaphoid. No hardware or bone tunnels were used. Outcome measures included VAS pain, QuickDASH scores, grip strength expressed as a percentage of the contralateral side, active wrist range of motion, and scapholunate and capitulunate angles on x ray. Dynamic stability was assessed through clinical examination at follow-up visits

Results: Mean VAS improved from 7.2 to 1.8 and QuickDASH from 54.6 to 14.3 at 6 months. Grip strength recovered to 88% of the contralateral side. Radiologic assessment showed normalization of midcarpal kinematics with mean scapholunate angle improving from 74° to 57°. Clinical assessment confirmed the absence of midcarpal subluxation during wrist motion in all cases. No donor-site morbidity, neurovascular complications, or reoperations occurred.

Conclusions: The Hammock Technique effectively restores carpal balance by addressing both dorsal and palmar instability through a biologically sound, minimally invasive approach. Early results demonstrate improved functional outcomes, stable kinematics, and low complication rates. Further prospective studies with long-term follow-up are warranted to validate its role in the contemporary management of midcarpal instability

A-0427 ARTHROSCOPIC RECONSTRUCTION TO RE-ESTABLISH CARPAL BALANCE: DORSAL LIGAMENTO-CAPSULODESIS PLUS SUTURE-BUTTON FIXATION IN CHRONIC REDUCIBLE SL DISSOCIATION

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Introduction: Chronic scapholunate (SL) dissociation disrupts the delicate balance of carpal kinematics, leading to progressive collapse and degenerative changes if left untreated. An ideal treatment should restore both mechanical

stability and physiological carpal balance while minimizing morbidity. Conventional open reconstructions, although effective, may compromise wrist motion and prolong rehabilitation. To address these limitations, we developed a new arthroscopic suture-button technique combined with dorsal capsuloligamentous repair. The method uses a low-profile suture-button construct to reduce and stabilize the SL interval while reinforcing the dorsal capsule to support midcarpal alignment, all without bone tunnels or hardware prominence.

Aim: To evaluate the outcomes of a newly developed arthroscopic suture-button technique combined with dorsal capsuloligamentous repair designed to re-establish carpal stability.

Material & Methods: 18 patients (13 men, 5 women; mean age 32.9 years) with chronic, reducible SL dissociation and LT laxity underwent this new arthroscopic stabilization procedure. Mean follow-up was 29 months. Outcomes included VAS pain, Mayo Wrist Score, grip strength, wrist flexion–extension arc, and radiographic parameters (SL gap, SL angle, radiolunate angle, LT angle). Pre- and postoperative values were compared using paired t-tests

Results: All patients maintained SL reduction throughout the follow-up period. The mean SL gap improved from 4.1 mm preoperatively to 2.1 mm ($p < 0.05$). Grip strength recovered to 85% of the contralateral side, and the mean Mayo Wrist Score increased from 45.3 to 89.2 ($p < 0.05$). VAS improved from 8 to 0.7 ($p < 0.05$). Grip strength improved from 33 kg to 42 kg ($p < 0.05$). Carpal alignment parameters demonstrated restoration of balanced scaphoid and lunate positioning. No major complications were observed.

Conclusions: This new arthroscopic suture-button technique with dorsal capsular reinforcement offers a safe and effective method for restoring stability in chronic reducible scapholunate dissociation with LT involvement. Early results demonstrate significant pain reduction, functional improvement, and stable radiographic outcomes. By supporting the physiological balance of carpal motion without altering native anatomy, this technique has the potential to provide more durable and harmonious wrist mechanics. Further studies are needed to confirm long-term effectiveness.

A-0428 CLINICAL COMPARISON OF SINGLE POSTEROLATERAL PLATE WITH MEDIAL CANNULATED SCREW FIXATION AND DOUBLE-PLATE FIXATION FOR EXTRA-ARTICULAR DISTAL HUMERUS FRACTURES

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Introduction: Double-plate fixation is the gold standard for extra-articular distal humerus fractures, but it carries a substantial risk of postoperative ulnar neuropathy. Fixation using a single lateral plate with medial cannulated screw may reduce ulnar neuropathy while maintaining fracture stability.

Aim: This study aimed to compare the clinical outcomes of single-plate with medial screw fixation versus double-plate fixation for extra-articular distal humerus fractures.

Material & Methods: Fifty-six patients who underwent surgery for extra-articular distal humerus fractures (AO/OTA classification A2 or A3) between January 2018 and August 2024 were divided into a double-plate group and a single-plate with medial screw group. The double-plate fixation was used in 30 patients, while the single-plate with medial screw fixation was used in 26 patients. All surgeries were performed using a posterior paratricipital approach. Bony union, radiographic healing, and loss of reduction were evaluated. Postoperative pain scores (visual analog scale at 2 days after the operation), operative time (min), elbow range of motion, elbow function (Mayo Elbow Performance Score [MEPS]), and the presence of postoperative ulnar neuropathy were compared between the two groups.

Results: The double-plate and single-plate with medial screw fixation were performed in 30 and 26 patients, respectively.

The mean age was 54.8 ± 19 years (range, 17–85 years), and the mean follow-up duration was 18.2 ± 6.5 months (range, 12–38 months). All fractures achieved solid osseous union at final follow-up. No significant differences were observed between the groups in terms of postoperative pain score, range of motion, and MEPS (all $p > 0.05$). However, the operative time was shorter for the single-plate with medial screw group than that for the double-plate group (112.5 ± 25.7 versus 172.2 ± 35.2 min, $p < 0.05$), and the operative time was significantly associated with the fixation method ($p < 0.05$). In addition, postoperative ulnar neuropathy occurred less frequently with the single-plate with medial screw group than with the double-plate group (8% versus 37%, $p = 0.013$).

Conclusions: Both double-plate and single-plate with medial screw fixation showed comparable union rates and functional outcomes in extra-articular distal humerus fractures. However, single-plate with medial screw fixation required a shorter operative time and was associated with a lower incidence of postoperative ulnar neuropathy than double-plate fixation.

A-0429 CLINICAL OUTCOMES AND RISK FACTORS FOR PLATELET-RICH PLASMA INJECTIONS IN LATERAL EPICONDYLITIS

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Introduction: Lateral epicondylitis is the one of the most common disorder affecting the elbow, and platelet-rich plasma (PRP) injections have been increasingly reported to offer favorable outcomes. However, not all patients experience satisfactory improvement, and studies investigating the risk factors associated with suboptimal response to PRP therapy remain limited.

Aim: This study aimed to evaluate the clinical efficacy of platelet-rich plasma (PRP) in the treatment of lateral epicondylitis and to identify risk factors associated with suboptimal outcomes.

Material & Methods: This retrospective study included 70 patients with lateral epicondylitis who underwent PRP injection after failing at least four weeks of conservative treatment. PRP was prepared using a standardized commercial kit and administered according to a consistent protocol. Clinical status before and after treatment was assessed using the Patient-Rated Tennis Elbow Evaluation (PRTEE) score, with a six-month follow-up serving as the primary endpoint. Ultrasound was used to evaluate tendon thickness, Doppler activity, and calcification. Simple radiographs were reviewed for the presence of soft tissue or enthesophytic calcification. Clinical and radiographic factors were analyzed using univariate and multivariate analyses

Results: Among the 70 patients, PRP injection led to a significant improvement in PRTEE scores at six months (from 55.25 to 26.23, $p < 0.001$). Overall, 50 and 20 patients demonstrated good and poor functional outcomes, respectively, assessed according to the minimal clinically important difference of the PRTEE. On univariate analysis, patients with poor functional outcomes had a significantly higher prevalence of calcification (55% vs. 12%, $p = 0.013$) and tended to have a longer symptom duration (14.3 months vs. 8.7 months, $p = 0.006$). However, multivariate analysis identified the presence of calcification as the only independent risk factor for a suboptimal response (odds ratio: 3.87, $p = 0.015$).

Conclusions: PRP injection yields favorable outcomes in most patients with refractory lateral epicondylitis. However, radiologically detected calcification is a significant risk factor for a poor clinical response and should be considered when counseling patients or planning treatment.

A-0430 REAWAKENING OF A GIANT CELL BONE TUMOR AFTER 40 YEARS OF SILENCE: A RARE CASE REPORT

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Introduction: Giant cell tumor of bone (GCTB) is a benign yet locally aggressive neoplasm that can rarely undergo malignant transformation and metastasize. Although local recurrence after surgical excision with intralesional curettage is relatively common and typically occurs within the first three to five postoperative years, recurrence following en bloc resection is infrequent.

Aim: To present a rare case of persistently recurrent GCTB of the distal ulna occurring 40 years after initial surgical excision and to highlight the importance of long-term postoperative surveillance.

Material & Methods: A retrospective analysis of a single patient case was conducted. The patient had previously undergone a Darrach procedure for excision of a distal ulnar GCTB four decades prior. Clinical presentation, imaging findings, treatment course—including surgical re-excision and medical management with denosumab—and postoperative outcomes were reviewed.

Results: After 40 years of dormancy, the patient presented with a recurrent mass at the site of the original lesion. The tumor was excised, but a second recurrence developed shortly thereafter. Treatment with denosumab failed to control the lesion, and the patient required re-excision due to signs of ulnar nerve palsy. The patient had an uneventful postoperative period and full recovery of the ulnar nerve palsy was observed 3 months later. Up to date, 18 months following the re-excision of the tumor, she is free of macroscopic disease and remains on low dose of denosumab for local control of the disease.

Conclusions: This late activation of a dormant GCTB underscores the tumor's unpredictable biological behavior and potential for delayed recurrence.

A-0431 ARTHROSCOPIC SCAPHOLUNATE STAIR SIGN IN PREDYNAMIC SCAPHOLUNATE INSTABILITY

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Introduction: Predynamic scapholunate (SL) instability can only be diagnosed through midcarpal arthroscopy by probing SL joint, because it is not visible on any radiographies and physical examinations are also ambiguous. Though stair-like incongruence of SL joint (arthroscopic stair sign) is abnormal finding that can be found during midcarpal arthroscopy, to date, the clinical significances and causes of the arthroscopic SL stair sign remain unclear.

Aim: The authors aimed to identify the cause of the arthroscopic SL stair sign and to analysis the clinical meanings in this study.

Material & Methods: We included 143 dorsal wrist impingement syndrome patients who confirmed by wrist arthroscopy, because dorsal wrist impingement syndrome have high possibilities of predynamic SL instability. The severity of SL stair sign (stair height), the abnormalities of primary and secondary SL stabilizers including dorsal, volar, and membranous portion of SL interosseus ligament, radioscapocapitate ligament, Long radiolunate ligament, dorsal radiocarpal, dorsal intercarpal ligament (DIC), and dorsal capsulo-scapholunate septum(DCSS) were measured and evaluated arthroscopically. The severity of SL instability and DCSS lesion was staged by EWAS (European Wrist Arthroscopy Society) arthroscopic classification of SL instability and Van Overstraeten's classification of DCSS Lesions, respectively. The DIC laxities were also evaluated as 3 grade based on arthroscopic probing (grade 0: normal ligament tension, grade 1: ligamentous laxity with a preserved endpoint, grade 2: ligamentous laxity with loss of endpoint). The relationships between stair height

and these arthroscopic findings were analyzed by regression analysis.

Results: The mean age of the patients was 35.3 ± 9.1 years, and they consisted of 74 females and 69 males. Multivariable regression analysis revealed a significant association between stair height and DIC grade 1 and 2 laxities. Compared to grade 0, grade 1 laxity was associated with a 0.269 ± 0.12 mm increase ($p = 0.03$), and grade 2 laxity with a 0.536 ± 0.17 mm increase ($p < 0.001$). SL ligament abnormalities and stage in EWAS arthroscopic classification were not significantly associated, while DCSS grade 3 showed a trend toward significance with stair length ($p = 0.083$). In summary, they mean that the arthroscopic SL stair sign is caused by DIC laxity, and it is observed even at the EWAS arthroscopic classification stage 1. Conclusions: DIC laxity is the earliest pathologic alteration in developing degenerative SL instability. The arthroscopic stair sign in midcarpal arthroscopy is a useful identifier to early diagnose predynamic SL instability than probing SL joint.

A-0432 AI-GUIDED EXERCISE FOR PEAK ADHERENCE: CLINICAL OUTCOMES OF DIGITAL THERAPY IN CHRONIC UPPER EXTREMITY PAIN

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Aim: This review theoretically and literature-based compares traditional Home Exercise Programs (HEPs) with Artificial Intelligence (AI)-supported Digital Therapeutic (DTx) solutions (e.g., Mobithera, Kaia Health) for managing chronic upper extremity pain, functional restrictions and daily living activity deficiencies commonly encountered in hand and upper limb rehabilitation practice. This comparison focuses on critical rehabilitation success parameters: patient adherence, objectivity of movement quality, pain symptom management, and clinician workload.

Methodology: This study was a systematic literature evaluation (scoping review). Randomized controlled trials, systematic reviews, and clinical perspective articles published in PubMed and Scopus (2015-2024) comparing digital therapeutics and traditional home exercises in chronic musculoskeletal pain and related neuromuscular restrictions were analyzed, with a specific focus on their applicability to upper extremity conditions. The comparison addressed:

1. Motivation/Adherence: Gamification and reminders.
2. Exercise Quality/Objectivity: AI-supported real-time feedback (computer vision).
3. Clinician Workload: Manual vs. Digital Remote Therapeutic Monitoring (RTM).
4. Clinical Outcomes: Pain and functional status impact.

Findings: Adherence & Motivation: Literature strongly suggests DTx maintains significantly higher patient adherence (high observation rates) compared to traditional HEPs via personalized reminders, progress tracking and gamification—a critical advantage for long-term upper extremity rehabilitation.

Quality & Objectivity: DTx platforms provide real-time, computer vision-supported feedback, ensuring patients perform exercises with correct joint mechanics. This is particularly vital for the complex movements of the hand and wrist, providing clinicians with objective, reliable data on exercise quality and frequency.

Efficiency & Impact: Automated prescription and instant data tracking drastically reduce the manual burden of clinician monitoring. Improved adherence and high-quality movement are linked to better long-term functional recovery and pain management in chronic upper extremity disorders.

Accessibility: Digital solutions enhance continuous treatment access, which is beneficial for patients experiencing chronic upper limb pain that limits travel or mobility.

Conclusion: Digital therapeutic applications offer distinct advantages in managing chronic upper extremity pain and achieving functional goals in hand rehabilitation, specifically by maximizing patient motivation, ensuring objective

exercise quality and enhancing clinical efficiency. AI-supported Remote Therapeutic Monitoring (RTM) addresses the lack of traceability and objectivity inherent in traditional home exercise and holds the potential to transform the standard of care for chronic upper limb conditions.

A-0433 INVESTIGATING MOVEMENT DURATION IN CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY

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Introduction: Brachial plexus birth injury (BPBI) is a peripheral nerve injury that causes functional deficits in the upper extremity. These deficits lead to restricted range of motion, muscle weakness, and the frequent adoption of compensatory strategies to achieve functional goals, such as excessive trunk motion. While compensatory strategies facilitate task completion, they may result in prolonged movement duration and reduced efficiency. Most studies focus on task completion; however, movement duration provides an important dynamic dimension to neuromuscular control by reflecting task efficiency. Understanding how movement duration relates to kinematic adaptations may offer valuable insight into motor performance in children with BPBI.

Aim: To identify kinematic and clinical factors that determine movement duration across six Modified Mallet Scale (MMS) movements in children with BPBI.

Material & Methods: The MMS, consisting of six upper-extremity movements (global abduction, global external rotation, hand-to-neck, hand-to-spine, hand-to-mouth, and hand-to-belly/internal rotation), was used as the clinical assessment tool, and children's MMS scores were recorded accordingly. Upper extremity and trunk kinematics of twenty-four children with BPBI (mean age 7.30 ± 0.41 years) during MMS movements were collected on both the affected and unaffected sides using Movella DOT (Movella Technologies B.V., Enschede, the Netherlands) inertial measurement units and processed using OpenSim's IMU inverse kinematics tool. Participants were instructed and trained in the six MMS movements prior to data collection. Each movement was performed three times, starting with the unaffected side. The trial that most accurately reflected the intended movement was selected for further analysis. Movement duration was defined as the time elapsed between the initiation and full achievement of each MMS movement. Movement durations between affected and unaffected sides were compared using the Wilcoxon signed-rank test. Multiple linear regression was performed to identify kinematic and clinical predictors of movement duration.

Results: MMS 1 and MMS 2 showed no significant side differences in movement duration ($p > 0.05$). In contrast, MMS 3, MMS 4, MMS 5, and MMS 6 exhibited significantly longer movement duration on the affected side ($p < 0.05$). The results of multiple linear regression analyses indicated that kinematic and clinical factors contributed to movement duration. In MMS 3, the overall model achieved considerable explanatory power ($R^2 = 0.304$) and approached statistical significance ($p = 0.060$). In this movement, trunk motion ($p = 0.048$) and MMS Score ($p = 0.014$) emerged as statistically significant predictors of movement duration. For MMS 4, 5, and 6, the models explained variances ranging from $R^2 = 0.227$ - 0.261 but did not reach significance level ($p = 0.103$ - 0.152). Only in MMS 5 trunk movement showed a strong trend toward significance ($p = 0.053$).

Conclusions: Movement duration was longer on the affected side; however, this prolongation was not fully explained by upper extremity limitation, trunk compensation, or MMS scores. These findings suggest that improving these components alone may be insufficient for enhancing overall movement performance. To better understand the determinants of

movement duration in children with BPBI, additional neuromotor factors such as motor planning, sensorimotor integration, temporal control and reaction time should be explored. Incorporating these factors into assessment and intervention approaches could inform more comprehensive and effective rehabilitation strategies.

A-0434 DEVELOPMENT OF A THERAPIST-ORIENTED PROGRAM INTEGRATED INTO A 3D INTERACTIVE APPLICATION

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Introduction: The rapid development of immersive technologies has created new opportunities for enhancing therapeutic interventions. Three-dimensional (3D) applications provide an interactive environment that can improve patient engagement, increase precision in assessment, and support personalized rehabilitation pathways. This program was developed to assist therapists in using a 3D platform as a complementary tool for evaluation and treatment.

Aim: To design and implement a therapist-oriented program integrated into a 3D application that enhances clinical assessment, supports guided rehabilitation exercises, and provides measurable data for monitoring patient progress.

Material & Methods: The program was developed using a 3D interactive environment that integrates customizable models, motion-based interactions, and therapist-controlled scenarios. User needs were identified through consultations with clinical specialists. The software architecture includes modules for assessment, exercise guidance, data tracking, and automated report generation. Usability testing was performed with therapists and patients to evaluate functionality, clarity, and therapeutic value.

Results: The 3D therapist program improved patient engagement and allowed more precise visualization of exercises and functional movements. Therapists reported increased efficiency in demonstrating tasks and monitoring performance. Data collection features enabled objective tracking of progress, while customizable scenarios supported individualized therapy plans. Overall, both patients and clinicians expressed high satisfaction with the platform's clarity, interactivity, and ease of use.

The integration of therapeutic tools within a 3D application provides a valuable enhancement to traditional rehabilitation methods. The program supports accurate assessment, personalized intervention, and improved communication between therapist and patient. Immersive 3D technology shows strong potential to become a standard complementary tool in modern clinical practice, contributing to more engaging and effective therapeutic outcomes.

A-0435 CLINICAL OUTCOMES OF REVERSE DORSAL METACARPAL ARTERY FLAPS IN THE RECONSTRUCTION OF DORSAL AND LATERAL FINGER SOFT-TISSUE DEFECTS

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Introduction: Soft-tissue defects of the dorsal and lateral aspects of the fingers are challenging to reconstruct due to the thin skin envelope, minimal subcutaneous tissue, and the superficial course of the extensor tendons.

Aim: In this study, we aimed to present our clinical outcomes in patients with dorsal and lateral finger injuries treated using the reverse dorsal metacarpal artery (RDMA) flap.

Material & Methods: Between July 2020 and July 2025, nine patients who underwent reconstruction of finger soft-tissue defects with an RDMA flap and who had a minimum follow-up of three months were included. Demographic characteristics,

injured finger, injury etiology, defect size, distal extent of the defect, flap dimensions, flap survival, associated injuries, and the need for secondary surgical intervention were evaluated retrospectively. Patient satisfaction was also assessed. Results: All patients were male. The etiology of injury was occupational accidents in eight patients and an in-vehicle traffic accident in one patient. One patient had amputations of two additional fingers and a defective bone injury at the PIP joint; two patients had proximal phalanx fractures; one had a distal phalanx fracture; and one had a volar palmar defect with tendon injury. The mean patient age was 41.5 years (26–65).

The affected fingers were the index finger in three patients, the middle finger in three patients, and the ring finger in three patients. The mean defect size was 4×1.5 cm, and the mean flap size was 5.5×1.8 cm. Two flaps developed superficial partial necrosis at the distal tip, which healed secondarily without the need for additional surgery. None of the patients required further surgical procedures. Donor sites were primarily closed in all cases.

The defects extended to the middle phalanx in two patients, the PIP joint and proximal phalanx in two patients, and the DIP joint in five patients. The defect location was dorsal in seven patients, dorsoradial in one patient, and dorsovolar in one patient.

According to the Michigan Hand Outcomes Questionnaire, all nine patients reported excellent or good results.

Conclusions: The reverse dorsal metacarpal artery flap is a reliable option for the reconstruction of soft-tissue defects proximal to the finger DIP joint, with minimal donor-site morbidity, high flap survival, and high patient satisfaction.

A-0436 DEVELOPING AN IN-VIVO PHYSIOLOGICAL PORCINE MODEL OF INDUCING ACUTE ATRAUMATIC COMPARTMENT SYNDROME TOWARDS A NON-INVASIVE DIAGNOSIS USING SHEAR WAVE ELASTOGRAPHY

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Introduction: Compartment syndrome (CS) is defined as impaired muscle perfusion due to increased pressure in the closed muscle compartment. The swollen muscle alters echogenicity on ultrasound and increases muscle stiffness. The increase in muscle stiffness can increase muscle elasticity that can be measured using the ultrasound image machine.

Aim: The authors devised a physiologic porcine leg model for acute atraumatic CS and intended to investigate the correlations of ICP and changes in muscle echogenicity, elasticity, and arterial blood flow velocity on ultrasound during acute CS.

Material & Methods: A total of 14 pigs (weight 40 ± 2 kg) completed the study considering two groups. The 14 pigs were divided into two groups: an echogenicity group (EG) and a shear wave elastography group (SEG). The left leg was considered as the experimental leg and the right leg as the control leg for all pigs. After deep general anesthesia, the pressure transducers were inserted into tibialis anterior muscle. Two ultrasound imaging machines were used to quantify the shear modulus of elasticity of the tibialis anterior muscle to quantify the echogenicity and arterial blood flow velocity in the EG. The common iliac artery (CIA) was tied with a rubber sling to block the blood flow of the CIA. The proximal thigh was tied with an elastic band to block other innominate collateral arteries around the thigh. We used 6 h for the injury time using leg ischemia. A total of seven measurements on both sides were obtained at 30min interval. after reperfusion of the CIA indicated as AR₁₂₀ min. In the SEG, a minimum of five SWE images were recorded at each time point, along with the ICP of both legs. In the EG, one B-mode image and blood flow image of the anterior tibial artery were recorded at each point along with the systolic and diastolic central blood pressure recordings, and the ICP of both legs.

Results: The maximum blood flow velocity showed significant differences between the experimental leg and control leg

at baseline ($p = 0.035$), AR_60min ($p = 0.049$), AR_90min ($p = 0.028$), and AR_120min ($p = 0.014$). The minimum blood flow velocity showed significant differences between the experimental leg and control leg at BR ($p < 0.007$), AR_0 min ($p = 0.049$), AR_90min ($p = 0.021$), and AR_120min ($p = 0.007$). There was a significant correlation between the perfusion pressure and the ICP ($p < 0.001$). The shear elastic modulus showed a significant effect of condition ($p = 0.027$) and time ($p = 0.003$). The shear elastic modulus showed a significant difference between the experimental leg and control leg at AR_30 min ($p = 0.028$). There was a significant correlation between the elastography and the ICP ($p < 0.001$, $\rho = 0.458$) and the perfusion pressure and the ICP ($p < 0.001$).

Conclusions: SWE can be an alternative method for safe CS diagnosis. Furthermore, ICP can be monitored continuously by the SWE, enabling physicians to detect CS at an earlier stage.

A-0437 SUCCESSFUL FUNCTIONAL OUTCOME FOLLOWING LATISSIMUS DORSI TO BICEPS TRANSFER FOR RESTORATION OF ELBOW FLEXION IN A PATIENT WITH COMPLETE RIGHT BRACHIAL PLEXUS INJURY

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Introduction: Brachial plexus injury in adults represents one of the most severe and functionally disabling forms of peripheral neuropathy. Its etiology is predominantly traumatic, with motorcycle accidents being the leading cause among young, active individuals. The reported incidence ranges from 1.2 to 4.2 cases per 100,000 inhabitants per year. These injuries often lead to partial or complete loss of upper limb function, resulting in significant impairment of personal autonomy, occupational performance, and social participation.

From a quality-of-life perspective, studies using assessment tools such as the SF-36 and DASH questionnaires have demonstrated marked deterioration across physical, emotional, and psychosocial domains, even several years after the initial trauma. The inability to perform basic activities such as feeding, dressing, or stabilizing the body during ambulation contributes to high levels of dependence and is frequently associated with psychological comorbidities including anxiety and depression.

The economic impact is equally substantial. The direct cost of surgical management and long-term rehabilitation has been estimated to range between 40,000 and 100,000 USD per patient within the first two years post-injury, excluding productivity losses due to permanent disability. In many cases, the young age of the affected population and the need for multiple reconstructive procedures further increase the socio-economic burden.

In this context, functional reconstruction strategies such as nerve and musculotendinous transfers play a pivotal role—not only as surgical interventions but as key elements in promoting social reintegration and restoring patient independence.

Aim: To evaluate the effectiveness of latissimus dorsi tendon transfer to the biceps brachii in restoring active elbow flexion in an adult patient with brachial plexus injury, and to assess its impact on the recovery of functional independence and quality of life.

Material & Methods: A 32-year-old male presented to the emergency department following a motorcycle accident with multiple contusions and a suspected right brachial plexus injury involving the C5–C7 roots. After hemodynamic stabilization, electromyography of the right upper limb revealed axonotmesis of the axillary nerve and delayed conduction in the radial and median nerves. The patient exhibited complete loss of active elbow flexion. He was referred to our center, where surgical reconstruction was indicated. A latissimus dorsi to biceps tendon transfer was performed through a subcutaneous tunnel, and fixation to the biceps tendon was achieved using the Pulvertaft weave technique to restore elbow flexion.

Results: At three months postoperatively, the patient achieved active right-elbow flexion of 30°, with muscle strength graded 2/5 on the Medical Research Council (Daniels) scale. A structured rehabilitation program was initiated to improve range of motion and muscle power. At six months, active flexion improved to 90°, with muscle strength graded 4/5. The patient continues to progress under supervised rehabilitation.

Conclusions: Complete brachial plexus injury in adults results in profound functional disability and a substantial reduction in quality of life. Latissimus dorsi transfer to the biceps brachii is a reliable reconstructive option that provides satisfactory restoration of elbow flexion and contributes significantly to the recovery of functional autonomy and quality of life.

A-0438 SURGICAL TECHNIQUES TO PREVENT REVISIONAL SURGERY AFTER SUBCUTANEOUS ANTERIOR TRANSPOSITION OF THE ULNAR NERVE

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Subcutaneous anterior transposition of the ulnar nerve is widely performed for the treatment of compressive ulnar neuropathies. However, postoperative complications such as adhesion or recurrent compression, instability, and dislocation of the ulnar nerve frequently result in the revisional surgery. Moreover, the clinical outcomes of such revision surgeries are often unsatisfactory. Therefore, to achieve favorable results after anterior transposition of the ulnar nerve, it is of utmost importance to obtain reliable outcomes in a single operation without requiring revision procedures. At our institution, we have effectively avoided reoperations through the application of several technical pearls during first surgery. We introduce and describe these surgical techniques.

the ulnar nerve is carefully identified proximal to the medial epicondyle. Proximal dissection is extended for 8–10 cm to ensure complete release of any compressive structures, including the arcade of Struthers and medial intermuscular septum. Distally, the Osborne ligament and fascial bands between the two head of the flexor carpi ulnaris (FCU) are divided sufficiently. The divided fascias of the flexor carpi ulnaris are each sutured to the anterior and posterior fascia respectively to keep them apart. The mobilized ulnar nerve is gently transposed to the subcutaneous bed. Care is taken to prevent torsion of the nerve and to preserve anatomical orientation. The nerve is stabilized in its new position using superficial fascia and deep fat tissue layer, not using a deep fascial sling. The adipofascial sling interruptedly sutured with anterior half of dissected Osborne ligament and the remained posterior half of Osborne ligament also sutured with adipofascial sling to prevent posterior re-subluxation. Hematoma formation is the major cause of postoperative nerve adhesion. Minimize soft tissue trauma and dead space are helpful to reduce hematoma and adhesion. Meticulous hemostasis should be achieved and a drain should be placed to prevent hematoma formation (Fig.3). Postoperatively, the elbow is immobilized at 90° of flexion for 1–2 weeks, followed by gradual mobilization. Early range-of-motion exercises are encouraged to reduce adhesion formation. In conclusion, successful subcutaneous anterior transposition of the ulnar nerve requires precise surgical execution and attention to detail. By applying the technical refinements outlined in this note, surgeons can minimize complications, prevent the need for revision surgery, and achieve more consistent functional recovery.

A-0439 DOES TRAPEZIAL DYSPLASIA PREDISPOSE TO EARLY ONSET SYMPTOMATIC BASAL JOINT ARTHRITIS?

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Background: Osteoarthritis (OA) affecting the trapeziometacarpal joint (TMJ) is a prevalent condition that causes pain and dysfunction. Studies indicate the occurrence of symptomatic OA of the TMJ in 16% to 20% of women over age 45, and 6% of men of the same age. While the literature predominantly focuses on ligament insufficiency, joint incongruity and load on the joint to explain the source of degeneration, bony deformities, such as trapezial dysplasia, have been comparatively underexplored. We aimed to evaluate the relationship between trapezial dysplasia and the development of TMJ arthritis. **Methods:** The archives were searched for all patients who underwent trapeziectomy or arthroplasty for TMJ arthritis at a large university tertiary medical center between the years 2012–2023. Radiographic measurements of trapezial tilt and inclination angles were performed according to the techniques described by Bettinger et al. and Garcia-Elias & Orsolini, on the earliest radiographs available. Measures of dysplasia were examined in correlation with patient age, sex, and arthritis severity according to the Eaton–Little classification.

Results: A total of 140 patients were examined, including 100 females (71.4%), and a mean age of 65.8 ± 8.8 years. No significant sex differences were found in trapezial inclination or tilt. Most operated hands presented originally with Eaton stage 2 (35.7%) or stage 3 (30.7%) osteoarthritis. Radiographic dysplasia was present in 50% of cases. Patients with dysplasia were younger at surgery compared with those without dysplasia (64.6 ± 8.8 vs. 67.0 ± 8.7 years, respectively, $p=0.052$). Trapezial tilt was higher in the operated versus contralateral hand (mean difference 1.79° , $p=0.042$), although we found a strong concordance in measures of dysplasia between hands of the same patient ($p=0.007$).

Eaton stages were not found to be correlated with age in the operated hand, but significantly correlated in the contralateral hand ($p=0.017$).

Discussion: The findings of this study suggest that TMJ dysplasia may contribute to earlier symptomatic arthritis, as patients with dysplasia tended to undergo surgery at a younger age. The modest but significant increase in trapezial tilt in the operated hand may implicate this as a biomechanical factor associated with symptom progression. In addition, trapezial morphology demonstrated moderate-to-strong bilateral correlation, supporting a structural, patient-specific predisposition.

Eaton stage at presentation was not correlated with age and surgery. Other factors are likely to create symptoms driving patients to seek operative treatment. Overall, these results emphasize the role of the underlying bony morphology in TMJ degeneration and raise the possible indication for deformity correction if symptoms present early, prior to radiographic signs of degeneration.

A-0441 EVALUATION OF INTEROBSERVER AGREEMENT IN A NEW CLASSIFICATION FOR EXTENSOR TENDON ZONES

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Introduction: The commonly used classification of extensor tendon has drawn a lot of attention recently. Many surgeons considered it to be complex, and there is inconsistency in the zones of the thumb and fingers. A new classification of extensor tendon zones was introduced in 2024. Few studies on the reproducibility of the new classification were retrieved.

More validation would be required before this new classification was adopted.

Aim: This study is aimed at evaluating the interobserver agreement of the new classification for extensor tendon zones, and to quantify its reproducibility in the management of this condition. The authors conjectured that this classification has good interobserver agreement.

Material & Methods: We recruited 50 participants for a new survey. The participants included 25 residents and 25 attending hand surgeons in China. We made a PPT including the schematic drawing of new classification of extensor tendon zones, literal explanation of each zone, and 25 photos of cases regarding extensor tendon laceration of different zones in hand (5 cases per zone) and sent it to participants. They were asked to study the schematic drawings of the new classification and literal explanation of each zone for 2–3 minutes first and then write down the zones of each case according to photographs provided. At the end, they rated the difficulty level of the use of the new classification: very easy, easy, neither easy nor difficult, difficult, very difficult, as well as their happiness of using this new classification (100–0%). The results were collected and analysed. In order to determine the interobserver reliability of using this new classification, the consistency among the answers of 25 residents, 25 attending hand surgeons and all 50 together was calculated using Fleiss Kappa, a statistic analysis of the inter-rater agreement between two or more raters. For all inferential tests, the alpha error value was set at 0.05.

Results: All 50 participants completed the exam and provided their answers. The new classification has high consistency and interobserver reliability among both residents and attending hand surgeons. The values of Fleiss Kappa among residents, attending hand surgeons and all participants were 0.904 (95% CI, 0.903–0.905), 0.925 (95% CI, 0.924–0.925), and 0.926 (95% CI, 0.926–0.926), respectively. 41 respondents felt that this new classification is very easy to use, and other 9 respondents considered the classification is easy. The mean happiness of all respondents was 94% (70%–100%). **Conclusions:** Based on the survey findings, this new classification of extensor tendon zones is reliable and practical, and the trainees and hand surgeons find it easy to remember and to use.

A-0442 LONG-TERM SHOULDER RANGE OF MOTION OUTCOMES IN CHILDREN UNDERGOING SHOULDER TENDON TRANSFER FOR BRACHIAL PLEXUS BIRTH PALSY: A RETROSPECTIVE ANALYSIS

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Introduction: Brachial Plexus Birth Palsy (BPBP) is one of the most common peripheral nerve injuries affecting upper extremity function in the neonatal period. It can result in significant deficits in shoulder abduction and external rotation, leading to long-term functional limitations

Aim: This study aimed to evaluate long-term shoulder range of motion outcomes, including flexion, abduction, and external rotation, in children who underwent shoulder tendon transfer using the modified Hoffer technique due to BPBP, and to assess the relationships between clinical outcomes and variables such as age at surgery, birth weight, sex, and the side of involvement.

Material & Methods: In this retrospective study, a total of 97 children were evaluated. The study population comprised 58.8% males and 41.2% females. The mean birth weight was 4329.95 ± 66.02 g. Age at surgery was categorized into two

groups to examine potential clinical differences: ≥ 4 years ($n = 74$) and < 4 years ($n = 23$). The type of involvement was classified according to the Narakas system, with the distribution as follows: Type 1, 17.5%; Type 2, 33.3%; Type 3, 42.3%; and Type 4, 7.2%. Shoulder joint function was assessed preoperatively and at 3, 6, 9, and 12 months postoperatively in terms of shoulder flexion, abduction, and external rotation using neutral joint motion (NJM) measurements. All assessments were performed using a Universal goniometer following standardized protocols. Statistical analyses were performed using SPSS v19.0. Between-group comparisons were conducted with the Independent Samples t-test or Mann–Whitney U test as appropriate. Categorical variables were analyzed using the Chi-square test, and associations between continuous variables were assessed with Pearson correlation. A significance level of $p < 0.05$ was applied.

Results: When examining the distribution of shoulder involvement, the right side was found to be predominant (52.6%). Male participants had significantly higher birth weights compared to females ($p = 0.014$). No significant associations were observed between sex and age at surgery ($p = 0.814$) or side of involvement ($p = 0.402$). Age at surgery (< 4 vs. ≥ 4 years) did not significantly affect shoulder flexion, abduction, or external rotation values (all $p > 0.05$). Strong positive correlations were observed between preoperative and postoperative measurements across all motion parameters ($r = 0.50$ – 0.84). Notably, the postoperative 12-month measurements showed particularly high correlations with earlier postoperative time points, with $r = 0.82$ for abduction and $r = 0.80$ for external rotation.

These findings indicate a consistent improvement in shoulder range of motion over time and suggest a stable pattern of postoperative recovery following tendon transfer.

Conclusions: This study demonstrates that long-term functional outcomes are favorable and stable in children undergoing shoulder tendon transfer due to BPBP. Age at surgery, whether before or after four years, did not have a significant impact on shoulder range of motion. The high correlation coefficients observed during the postoperative period support the notion of sustained functional improvement. These results highlight the importance of regular follow-up to monitor and reinforce long-term outcomes.

A-0444 ARTHROSCOPIC RADIAL HEMI-LUNATE SURFACE DEBRIDEMENT FOR BAIN TYPE 1 KIENBÖCK'S DISEASE: A TARGETED LUNATE SURFACE PROCEDURE MAINTAINING CARPAL STABILITY

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Introduction: Kienböck's disease is an idiopathic avascular necrosis of the lunate, primarily affecting young to middle-aged adults, and often results in progressive pain, reduced wrist mobility, and loss of grip strength. In early stages, disease may be confined to the radial articular surface, with preserved scapholunate (SL) and lunatotriquetral (LT) ligaments. Disruption of load-sharing across the radiolunate articulation compromises radiocarpal balance, leading to joint irritation and functional limitation. Current management options are limited for this subset, and minimally invasive interventions that selectively address focal lunate lesions while maintaining intrinsic ligamentous stability remain underexplored. Arthroscopic debridement provides a potential strategy to restore cartilage–bone interface integrity, but its impact on hemi-lunate lesions and preservation of carpal equilibrium has not been systematically evaluated.

Aim: This study aimed to evaluate the safety and efficacy of a targeted arthroscopic procedure addressing the radial lunate surface in Bain Type 1 Kienböck's disease. We hypothesized that selective debridement of necrotic cartilage–subchondral tissue, while preserving SL and LT ligament integrity, would restore radiocarpal balance, reduce pain, and improve functional outcomes in this early-stage patient population.

Material & Methods: Fifteen patients (mean age 36; range 28–44) with arthroscopically confirmed Bain Type 1 disease underwent radial lunate surface debridement between 2018 and 2024. Standard dorsal radiocarpal and midcarpal portals were used. Only the focal radial lunate cartilage defect was debrided to a viable subchondral base using a 2.9-mm shaver, micro-burr, and curettes, while SL and LT ligament integrity was verified intraoperatively. Clinical outcomes included VAS pain scores, DASH functional scores, wrist range of motion (flexion–extension and radial–ulnar deviation), and grip strength, measured preoperatively and at 12 months. Radiographs were evaluated for lunate height, sclerosis, and radiocarpal alignment. Paired t-tests were used for statistical analysis, with significance set at $p < 0.05$.

Results: All patients completed follow-up (mean 30 months; range 24–46). VAS scores improved significantly from 6.8 ± 1.1 preoperatively to 1.2 ± 0.7 at 12 months ($p < 0.001$). DASH scores decreased from 69 ± 14.3 to 6.2 ± 3.2 ($p < 0.001$). Flexion–extension arcs increased from $60^\circ \pm 10^\circ$ to $80^\circ \pm 15^\circ$, and radial–ulnar deviation showed significant gains ($p < 0.05$). Grip strength approached symmetry with the contralateral wrist. No postoperative instability or major complications were observed, and radiographs showed no lunate collapse or degenerative progression, suggesting restoration of mechanical balance within the radiolunate joint.

Conclusions: Targeted arthroscopic debridement of the radial lunate surface in Bain Type 1 Kienböck's disease is a safe, minimally invasive procedure that restores radiocarpal load balance, alleviates pain, and improves function. By preserving SL and LT ligament integrity, this hemi-lunate–focused approach maintains intrinsic carpal stability, offering a biologically rational strategy for early-stage Kienböck's disease. Further biomechanical and prospective studies are warranted to define long-term outcomes and the role of balance restoration in disease progression.

A-0445 SONOGRAPHIC EVALUATION OF TENDINOUS MALLET FINGER TO ESTIMATE EXTENT OF EXTENSION LAG

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Introduction: Mallet finger that arises solely from disruption of the tendon insertion is classified as “tendinous mallet finger (TMF)”. TMF is most often managed successfully with splint immobilization as a conservative treatment. Nonetheless, residual extension lag at the end of treatment course is a well-recognized outcome. The significant residual extension lag can impact both cosmetic appearance and functional outcomes. Therefore, both surgeons and patients are concerned regarding the degree of extension lag that will ultimately remain following conservative treatment of tendinous mallet finger. However, rare studies have been published that specifically address which method best informs surgeons about the expected residual extension lag in tendinous mallet finger.

Aim: We aimed to assess the association between sonographic classification of acute tendinous mallet finger (TMF) and the degree of extension lag remaining at the final follow-up.

Material & Methods: The inclusion criterion was acute tendinous mallet finger with onset within 2 weeks. Thirty-eight patients (23 male and 15 female) participated, with a mean follow-up duration of 17.1 (12.3–23.5) months. Range of motion, including extension lag, was measured at both the initial presentation and at the final follow-up. All patients were managed conservatively using a finger splint for a period exceeding 6 weeks. Ultrasonography was performed for all participants to assess the severity of terminal extensor tendon injury. Statistical analyses examined the relationship between sonographic type and extension lag at final follow-up.

Results: At initial presentation, the mean extension lag was 46.0 degrees, which improved to 17.5 degrees at the last follow-up. TMF cases were categorized into three sonographic types (hypo-echoic, thinned, and wavy) based on ultrasound characteristics. A significant difference in extension lag at final follow-up was observed among TMF groups ($P = 0.005$).

Patients with the "wavy" type had the greatest mean extension lag, whereas those with the "hypo-echoic" type had the least mean extension lag, with statistical significance.

Conclusions: Sonographic assessment of TMF can aid in predicting residual extension lag in patients with tendinous mallet finger undergoing conservative treatment with a finger splint.

A-0446 COMPARISON OF OPEN VS ARTHROSCOPICALLY-ASSISTED MINI-OPEN PRC IN ADVANCED KIENBÖCK DISEASE Erdem Özden¹, İsmail Bülent Özçelik^{2,3}, Yücel Ağirdil^{2,3}

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Introduction: Proximal row carpectomy (PRC) is a recognized salvage procedure for advanced-stage Kienböck disease (Lichtman Stage IIIB–IIIC), in which lunate collapse disrupts radiocarpal load distribution and compromises wrist balance. Traditional open PRC allows direct visualization but can disrupt soft tissues, delay postoperative mobilization, and impair restoration of wrist equilibrium. Arthroscopically-assisted mini-open PRC (AAPRC) has emerged as a minimally invasive alternative, facilitating precise resection of the proximal carpal row while preserving surrounding capsular and ligamentous structures critical to intrinsic carpal stability. This approach may enable earlier functional recovery, improved wrist mechanics, and more balanced load transmission across the radiocarpal joint.

Aim: This study aimed to compare clinical and functional outcomes, with a focus on radiocarpal balance and wrist stability, between open PRC and AAPRC in patients with Lichtman Stage IIIB–IIIC Kienböck disease. We hypothesized that the minimally invasive AAPRC technique would better restore mechanical balance, improve early and long-term function, and enhance patient-reported outcomes.

Material & Methods: Medical records of patients undergoing open PRC (Cohort A, n=14) and AAPRC (Cohort B, n=21) were retrospectively reviewed. Outcomes included Visual Analog Scale (VAS) for pain, QuickDASH scores, Modified Mayo Wrist Scores, and wrist flexion, measured preoperatively, at three months, and at final follow-up. Differences between groups were analyzed to evaluate restoration of wrist function and load balance over time.

Results: Preoperative VAS scores were comparable (mean 7). At three months, VAS scores decreased to 3 in Cohort A and 0.3 in Cohort B, with final scores of 0.3 versus 0.1. QuickDASH improved from 69→34→6.1 in Cohort A and 77→18→5 in Cohort B, indicating superior early and late functional outcomes with AAPRC. Final Modified Mayo Wrist Scores were excellent in 4, good in 4, moderate in 6 for Cohort A, versus excellent in 11, good in 8, moderate in 2 for Cohort B. Mean wrist flexion increased from 43°→52° in Cohort A and 41°→62° in Cohort B. The minimally invasive AAPRC approach facilitated earlier postoperative motion, promoting mechanical equilibrium and balanced load distribution across the wrist.

Conclusions: AAPRC provides superior early and long-term restoration of radiocarpal balance compared to conventional open PRC. By preserving soft tissue integrity and enabling earlier mobilization, the technique enhances wrist motion, reduces pain, and improves functional scores. This minimally invasive, balance-focused approach represents a biologically rational strategy for advanced-stage Kienböck disease, optimizing both carpal stability and radiocarpal load distribution.

A-0447 ENHANCED SCAPHOID FIXATION WITH KIRSCHNER WIRE: A CLINICAL AND FINITE ELEMENT STUDY

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Introduction: The scaphoid is the most commonly fractured carpal bone, particularly in young, active individuals with high functional demands. Despite advances in fixation techniques, complications such as nonunion and avascular necrosis remain challenging due to its precarious vascularity and retrograde blood flow. Headless compression screws are widely accepted as the gold standard for fixation; however, loss of stability and rotational displacement may still occur. Augmentation with additional fixation elements could improve mechanical stability and promote union. This study aimed to investigate the clinical outcomes and biomechanical effects of adding a Kirschner wire (K-wire) to screw fixation in scaphoid fractures and nonunions.

Aim: To evaluate the clinical outcomes and biomechanical effects of adding a Kirschner wire to screw fixation in scaphoid fractures and nonunions.

Material & Methods: We retrospectively analyzed 23 patients (20 males, 3 females; mean age 29.7 years; range, 18–43) who underwent surgical treatment for scaphoid fractures or nonunion between January 2020 and November 2023. Patients were divided into two groups: screw-only fixation (n=11) and screw + supplementary K-wire fixation (n=12). In cases of nonunion, autografting from the distal radius or iliac crest was also performed. Postoperative evaluation included clinical outcomes using the Visual Analog Scale (VAS), Mayo Wrist Score, and Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) at an average 12-month follow-up. Finite element analysis (FEA) was conducted using Siemens NX for 3D modeling and ANSYS 2023R2 for simulation. Fracture stability was assessed by calculating stress intensity factors (SIF) under axial and multiplanar loading conditions.

Results: Of the 23 cases, 15 involved waist fractures, seven proximal pole fractures, and one distal pole fracture. Patients treated with screw + K-wire fixation showed superior clinical outcomes compared with screw-only fixation (VAS: 0.1 vs. 2.0, $p=0.011$; Mayo Wrist Score: 96.3 vs. 84.6, $p=0.027$; QuickDASH: 1.7 vs. 7.2, $p=0.009$). Based on categorical Mayo classification, 83.3% of patients in the screw + K-wire group were rated excellent versus 54.5% in the screw-only group. FEA demonstrated consistently lower SIF values across all fracture modes in the screw + K-wire group (K1: 24.4 vs. 30.6; K2: 33.9 vs. 36.8; K3: -2.5 vs. -3.2 MPa $\sqrt{m}$), indicating reduced stress concentration and enhanced stability.

Conclusions: Adding a Kirschner wire to screw fixation improves both clinical outcomes and biomechanical stability in scaphoid fractures and nonunions. The combined construct reduces stress at the fracture line, limits rotational displacement, and correlates with superior pain and functional scores. This technique represents a simple, effective, and cost-efficient option that may decrease postoperative discomfort and improve union rates.

A-0448 SCAPHOLUNATE LIGAMENT LESIONS: PRELIMINARY OUTCOME REPORT FOLLOWING 360- DEGREE SL-LIGAMENT TENODESIS

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Introduction: Scapholunate (SL) ligament reconstruction is typically performed on complete SL ligament lesions with reducible SL instability without cartilage changes. There is no single universally accepted method of performing SL ligament reconstruction, but there is consensus about protecting the SL-ligament reconstruction, typically with Kirschner wires for up to 10 weeks postoperatively before return to gradual increased wrist motion. This long immobilization has resulted in slow return to activities of daily living with the increased risk of permanently reduced range of wrist motion

Aim: The purpose of this study was to assess early return to manual work by performing SL ligament reconstruction (SL-360) utilizing Arthrex' SutureTape as an adjunct to a free tendon graft (InternalBrace™) thereby allowing controlled wrist movement from 2 weeks postoperatively.

Material & Methods: 11 patients with a median age of 47 years (23- 61) have since March 2024 been consecutively included in this study, after diagnostic arthroscopy confirmed complete SL ligament lesions with neither cartilage changes nor concomitant lesions. Preoperative x-ray, clinical and subjective functional outcomes were assessed (wrist ROM, grip strength, Quick Dash and PRWHE) and repeated at 3, 6 and 12 months. Surgery was performed through a dorsal and volar longitudinal approach, a palmaris longus graft with a 1,3 mm Arthrex SutureTape tunnelled through (2,5/3 mm) drill holes in the scaphoid and lunate and fixed with (3x8 mm) biotenodesis screws to achieve a 360-degree ligament tenodesis. The wrist was immobilized in a plaster cast for 2 weeks followed by occupational therapy with initial focus on movement and increased weight-bearing allowed at 4 weeks

Results: All patients except for 1 patient (who had severe long-term preoperative pain) experienced full pain relief after surgery. Due to the relatively quick recovery of wrist motion and strength, 8 patients were able to return to full manual work at 3 months. No postoperative complications were observed.

Conclusions: The examined cohort is small, but results show that the SL-360 ligament reconstruction with InternalBrace™ is a reproducible technique with overall improvement in outcomes like pain relief, recovery of grip strength and wrist function with a shorter rehabilitation time and quicker return to manual work.

A-0449 VASCULARIZED PERIOSTEAL GRAFTS IN HUMERUS DEFECTS: RESTORING STRUCTURAL AND FUNCTIONAL BALANCE

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Introduction: Reconstruction of segmental humeral defects remains a significant challenge in upper limb surgery, as it requires not only bone continuity but also preservation of functional motion. Traditional bone grafts often fail to provide sufficient biological activity for complete integration, leading to delayed healing or suboptimal outcomes. Vascularized periosteal grafts have emerged as a promising alternative, offering both osteogenic potential and enhanced vascular support. In the context of upper limb reconstruction, achieving a balance between structural stability and functional recovery is paramount.

Aim: This study aimed to evaluate the clinical and radiological outcomes of vascularized periosteal grafts in the management

of humeral defects and to assess how this technique supports the restoration of functional balance in the upper extremity. **Material & Methods:** We performed a retrospective analysis of six patients (4 males, 2 females; mean age 42 years) with segmental humeral defects treated using vascularized periosteal grafts. The defects resulted from trauma (n=4) or post-tumor resection (n=2). Grafts were harvested from the medial femoral condyle and applied in a wrap-around fashion to the defect, followed by stable internal fixation with plates and screws. Postoperative rehabilitation emphasized early passive mobilization to maintain joint range while allowing graft consolidation. Patients were followed for a mean of 18 months (range: 12–24 months). Outcome measures included radiographic union, range of motion (ROM), grip strength, and patient-reported functional scores (DASH).

Results: All six patients achieved radiographic union within 12–16 weeks. Functional assessment revealed near-normal shoulder and elbow ROM in five patients, with one patient exhibiting mild limitation of flexion (<20°). Grip strength reached an average of 85% compared to the contralateral side. No major complications such as infection, graft failure, or donor site morbidity were observed. Radiographs demonstrated well-integrated grafts with maintained bone length and alignment. Patient-reported outcomes indicated high satisfaction and return to daily activities without significant limitations.

Conclusions: Vascularized periosteal grafting offers an effective solution for humeral defects, providing both biological activity and structural support. The combination of stable fixation with vascularized periosteum allows simultaneous restoration of bone continuity and upper limb function. This approach not only addresses the physical defect but also restores equilibrium in limb mechanics, facilitating meaningful improvements in patient quality of life. Future studies with larger cohorts and longer follow-up are warranted to refine technique parameters and further validate the role of vascularized periosteal grafts in achieving optimal balance in complex upper limb reconstructions

A-0453 CONSUMPTION OF PAIN MEDICATION IN INDIVIDUALS FOLLOWING DIAGNOSIS OF TYPE 1 AND TYPE 2 COMPLEX REGIONAL PAIN SYNDROME

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Introduction: Individuals with Complex Regional Pain Syndrome (CRPS) experience pain disproportionate to any previous event or trauma. The condition is diagnosed by the internationally agreed Budapest criteria. CRPS can be divided into type 1 (no evidence of nerve injury) and type 2 (injury to or entrapment of at least one peripheral nerve trunk). Symptoms and clinical signs of the two types are essentially considered identical, but CRPS type 2 differs from classical neuropathic pain in that symptoms and signs extend beyond the territory of the affected nerve. Various strategies are used to treat CRPS, including different pain medications, such as opioids (i.e., psychoactive analgesics), gabapentin, and pregabalin, as well as three medications recommended in Swedish guidelines for treatment of neuropathic pain, amitriptyline, duloxetine, and venlafaxine.

Aim: Our aim is to evaluate any association between the use of the defined pain medications and Complex Regional Pain

Syndrome (CRPS) in the upper and lower limbs, and to assess the impact of demographic and socioeconomic factors. **Material & Methods:** Relative risks (RR) [95% confidence intervals (CI)] for use were estimated for three time periods (1. before, 2. after, 3. both before and after the diagnosis) using a national record linkage database comprising 5,942,855 individuals aged 25–80 years. This included individuals with CRPS type 1 (n=939; 0.016%), CRPS type 2 (n=224; 0.004%), and nerve injuries (n=25,081; 0.42%) analysed using logistic regression. Dispensations of the pain medications – opioids, gabapentin, pregabalin, and the antidepressants amitriptyline, duloxetine, and venlafaxine – were identified via ATC codes (use defined as 60% of time in a covered year).

Results: Before, after, and both before and after the CRPS diagnosis, 8.7%, 11.3% and 14.3% of individuals with type 1 CRPS, and 9.4%, 16.1% and 17.9% of those with type 2 CRPS, respectively, used pain medications (reference: use in the general population 0.4%, 0.5%, 0.6%, respectively). These rates were higher than those observed in individuals with nerve injuries without CRPS (2.9%, 2.9% and 4.0%, respectively). Unadjusted RRs for pain medication use before, after and both before and after the diagnosis of a nerve injury or CRPS (reference: general population) were over six times higher in individuals with nerve injuries without CRPS [6.31 (5.85–6.79); 7.31 (6.78–7.88); 6.69 (6.28–7.14), respectively], approximately 25 times higher in individuals with CRPS type 1 [26.88 (21.96–32.92); 23.77 (18.94–29.82); 26.67 (22.20–32.03), respectively] and more than 33 times higher in those with CRPS type 2 [40.46 (28.32–57.80); 25.69 (16.39–40.28); 34.83 (24.74–49.03)]. These estimates decreased only slightly after adjustment for age, sex, and socioeconomic position. Women (RR ~1.7), individuals with middle (~1.8) and low incomes (~2.3), native-born individuals compared to immigrants (~1.2), and those living alone compared to those cohabiting (~1.6) had a higher risk of use of the defined pain medications. **Conclusions:** Individuals with CRPS, especially with type 2, have a markedly increased risk of use of pain medication. Female sex and lower socioeconomic position further elevate this risk.

A-0454 BIOMECHANICAL ASSESSMENT OF AN INNOVATIVE V-SHAPED TENODESIS TECHNIQUE FOR A2 PULLEY RECONSTRUCTION USING A FREE PALMARIS LONGUS TENDON GRAFT

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Introduction: A2 pulley ruptures significantly compromise digital flexor mechanics, often resulting in bowstringing and reduced grip strength. When conservative treatment is insufficient, surgical reconstruction becomes necessary to restore finger function.

Aim: This biomechanical study aimed to assess a V-shaped three-point tenodesis technique using a free palmaris longus (PL) tendon graft for the reconstruction of traumatic A2 pulley injuries and to compare its mechanical performance with two established reconstruction methods.

Material & Methods: A simulated A2 pulley rupture was created in 27 fingers (index, middle, and ring) obtained from nine human cadaveric hand specimens. The A2 pulleys were then reconstructed using either the novel V-shaped tenodesis technique, a double-loop encircling method, or a suture-anchor-based graft fixation. Ultimate load to failure and failure modes were subsequently recorded and analyzed.

Results: The V-shaped tenodesis technique demonstrated significantly higher failure loads (mean: 299 N; p = 0.004) compared with the other reconstructions. In this group, the only observed failure mechanism was central tenodesis screw extrusion. By contrast, reconstructions using the other two methods failed due to suture cut-out.

Conclusions: The increased load tolerance of the new technique may support safer early mobilization after A2 pulley reconstruction. Additionally, the absence of sutures and the preservation of extensor structures may contribute to reduced complication rates.

A-0455 MEDIAN NERVE BIOMECHANICS PROXIMAL TO THE CARPAL TUNNEL: ULNAR TRANSLOCATION AND PALPABLE PROMINENCE WITH TRIPOD PINCH AND WRIST FLEXION

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Introduction: The median nerve slides from radial to ulnar depending on the hand and wrist position. The ability of the median nerve to slide is reduced in mild carpal tunnel syndrome. Individuals with carpal tunnel syndrome, whose occupation involves tripod pinch, such as artists, sign writers or surgeons, may notice occasionally that this position provokes carpal tunnel symptoms. Our observation was that the median nerve becomes palpable at the proximal wrist crease during this posture.

Aim: The study aim was to assess the amount of sliding of the median nerve in the tripod pinch, wrist flexed, position, as measured by number of tendons traversed, compared with the neutral hand and wrist posture..

Methods: Twenty healthcare professionals or students (40 wrists) were selected for ultrasound analysis of the median nerve at the proximal and distal wrist crease. Participants had no previous carpal tunnel or wrist surgery. The number of tendons traversed by the median nerve in the neutral position and for two movements were recorded: wrist flexion with tripod posture (unloaded) and tripod pinch (loaded).

Results: The participants had a mean age of 33 (range 20-65), 7 were male, 13 female. On wrist flexion and tripod posturing, the number of tendons radial to the median nerve was 5 in 28 wrists, 3 in 11 wrists and 1 in one wrist. On tripod pinch, it was 7 in two wrists, 5 in 35 wrists, 3 in two wrists and 1 in one wrist. The median number of tendons radial to the nerve was 5 in both postures ($p=0.05$), which was significantly different from neutral ($p<0.001$).

Conclusions: Tripod pinch with wrist flexion produces tension in the long flexor tendons of the thumb, index, middle fingers, which displace the median nerve from the radial side to the ulnar aspect of these tendons prior to entering the carpal tunnel. The nerve is subcutaneous and palpable in this position in most individuals.

A-0456 USE AND USEFULNESS OF COMPENSATORY AIDS AND STRATEGIES IN INDIVIDUALS WITH THUMB AMPUTATIONS: A QUALITATIVE INTERVIEW STUDY

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Introduction: The thumb is essential for grip, manipulation of objects, and fine motor control. Consequently, thumb amputation can impact an individual's ability to perform everyday activities. When replantation is not possible, thumb prostheses, assistive devices, and adaptive strategies may offer partial functional or aesthetic compensation. However, research on the use, non-use, and perceived usefulness of compensatory aids and strategies remain scarce. Insight into personal and contextual factors influencing individuals' choices and self-management approaches can support tailored interventions and prosthetic innovations.

Aim: This study aims to explore the experiences of individuals with traumatic thumb amputations, focusing on their

use and perceived utility of prostheses, assistive devices, and adaptive strategies. The overall aim is to support clinical decision-making and enhance individualized rehabilitation services.

Material & Methods: We employed a qualitative study design, using semi-structured interviews. Inclusion criteria were age ≥ 18 years, traumatic thumb amputation at or proximal to the distal joint, follow-up at the hospital or orthopaedic workshop between 2020–2024, receipt of a prosthesis or assistive device ≥ 3 months prior to the interview, and proficiency in the national language. Demographic and injury data were obtained from medical records and interviews. Interviews were conducted by an occupational therapist and a prosthetic engineer, alternating roles between interviewer and note-taker. Sessions were held in person or via video, audio-recorded, and transcribed verbatim. A thematic analysis will be conducted following Braun and Clarke's methodology.

Results: Twelve patients (8 men and 4 women) age 19–77 years with thumb amputations at various levels were included; several had additional finger injuries. Ten interviews were performed in person and two remotely. Most participants used a static silicone thumb prosthesis, anchored to the palm or to residual finger via vacuum. Other aids include body-driven prosthetic and solutions for ski poles and bicycle handlebars.

Prostheses were used both for practical and emotional reasons, needs and preferences evolving over time. Thematic analysis is ongoing, and results will be available by May 2026.

Conclusions: This study will provide insights into the lived experiences of individuals with thumb amputations, highlighting functional and psychosocial impacts of prosthetic and compensatory interventions. The findings may inform targeted rehabilitation strategies and strengthen the evidence base for upper limb prosthetic care.

A-0457 MINI-OPEN APPROACH FOR MOTEC® TOTAL WRIST ARTHROPLASTY

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Introduction: The standard approach for total wrist arthroplasty is a longitudinal dorsal incision.

Drawing on extensive experience in wrist surgery through a short transverse dorsal approach (such as for proximal row carpectomy or scapholunate ligament reconstruction) and having performed numerous total wrist arthroplasties, the author sought to assess the feasibility of using this approach for implantation of a Motec® (Swemac) total wrist prosthesis.

Aim: To demonstrate the feasibility of total wrist arthroplasty through a short transverse approach. The different steps of the Motec® prosthesis implantation are recorded on video, from the surgical approach to wound closure.

Material & Methods: The last three Motec® (Swemac) total wrist prostheses have been implanted using this mini-open approach in two men and a woman in 2025. Indications were advance radiocarpal and midcarpal arthritis in all the cases.

Results: Implantation of Motec® (Swemac) prosthesis is straightforward using this approach. The main advantage is that it requires less soft-tissue dissection than the traditional longitudinal approach, thereby reducing the risk of tendon and skin adhesions.

In addition, the cosmetic outcome is highly appreciated by the patients.

Conclusions: For surgeons familiar with the dorsal transverse approach to the wrist, total wrist arthroplasty using the Motec® (Swemac) prosthesis is a feasible option. Beyond being safe and reliable, it also offers high patient satisfaction, particularly regarding aesthetic outcomes.

A-0458 EARLY MOBILISATION FOLLOWING TRAPEZIOMETACARPAL IMPLANT ARTHROPLASTY IS SAFE AND EFFECTIVE: EVIDENCE FROM A COMPARATIVE COHORT STUDY

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Introduction: Total joint implant arthroplasty (TJA) is a well-established treatment for trapeziometacarpal (TMC) osteoarthritis. A wide variety in post-operative protocols is reported, with both immobilization and early active mobilization being described. Immobilization may promote osseointegration, whereas early active mobilization may counteract the adverse effects of immobilization, such as muscle atrophy and reduced range of motion. However, comparative studies are lacking.

Aim: To determine whether early active mobilization (EAM) with a brace and early functional use after TMC arthroplasty is non-inferior to cast immobilization regarding effectiveness and safety.

Material & Methods: This retrospective non-inferiority study included patients with symptomatic TMC osteoarthritis who received a dual mobility prosthesis between 2020 and 2025. Two protocols were compared: (1) 4 weeks of cast immobilization, and (2) EAM: 1 week compressive bandage followed by 3 weeks neoprene brace and start of functional use. Primary outcome was the Michigan Hand Outcomes Questionnaire (MHOQ) at 3 months. A non-inferiority margin of 17 points which is established as the minimal clinically important difference (MCID). Secondary outcomes were MHOQ subscales, strength, active range of motion, return to work, complications within one year. For the complication analyses, additional patients could be included because complete MHOQ data were not required.

Results: For the primary outcome, data from 30 patients in the immobilization group and 37 patients in the EAM group were analysed. For the complication analysis, 32 patients in the immobilization group and 123 patients in the EAM group were included. Baseline characteristics, including age, gender, smoking status, ASA score, operated hand dominance, and baseline MHQ scores, were comparable between groups, except for paid employment; a larger proportion of patients in the EAM group had paid employment. For the MHOQ total score, the mean difference (EAM – Immobilization) was 5.4 points (95% CI -3.3 to 14.1). As the lower bound of the CI remained above the predefined non-inferiority margin of -17 points, non-inferiority was demonstrated. The CIs for the MHQ subscales hand function, pain, activities of daily living and work also surpassed their respective MCIDs, supporting non-inferiority within these domains. No significant differences were observed for the MHQ subscales aesthetics and satisfaction, nor for AROM or strength. The proportion of employed patients was 8 out of 27 (29.6%) in the immobilization group and 22 out of 37 (59.5%) in the EAM group. Return-to-work outcomes suggest that patients treated with a brace experienced fewer limitations in their daily work activities, although the data were not conclusive due to the small sample size and baseline differences. Complications were rare and comparable between groups: one revision surgery (due to cup loosening) occurred in the immobilization group, and two revisions in the EAM group; one for cup loosening and one following dislocation after a fall on the hand. **Conclusions:** EAM is non-inferior to cast immobilization and represents a safe postoperative approach after TMC arthroplasty.

A-0459 NEUROMUSCULAR BALANCE IN OSTEOARTHRITIS OF THE THUMB

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Introduction: Stability of the thumb carpometacarpal joint is based on equilibrium between its ligaments, muscles and joint congruity. Muscle contraction is important and there are extrinsic and intrinsic muscles that intervene in it and they have to be in perfect balance.

Aim: The goal of this study is to analyze the neuromuscular activity on the thumb during pinch and grasp in patients with symptomatic osteoarthritis and in healthy group differentiating them by gender

Material & Methods: A prospective study was performed on 97 patients with a gender distribution of 26 male and 71 female, divided in two groups (68 healthy group and 28 patients with symptomatic osteoarthritis (OA) with a mean age of 44,3 in healthy men (21-65), 70,5 in symptomatic men (56-84), 46,2 in healthy women (19-79) and 62,4 in symptomatic women (47-79). The participants performed isometric contraction in termino-terminal and termino-subterminal key pinch, grip in neutral position while superficial electromyographic activity of 6 channels and an isometric dynamometry was registered. We recorded and analyzed the activity of the first dorsal interosseous, extensor pollicis longus, flexor pollicis longus and adductor pollicis muscles.

Results: As the age of the participant increases, a reduction of the activity of the intrinsic muscles and an increase of the activity of the extrinsic musculature were observed in women, when we compare the arthritic group and the healthy group, especially in key pinch. In men, when we compared both groups, we observed the opposite results. There was a decrease of the activity of the extrinsic muscles and an increase of the activity of the intrinsic muscles.

Conclusions: The study shows a different neuromuscular pattern related with gender and age influences in the loss of strength of the thumb. We can consider that intrinsic muscular potentiation with physiotherapy could be useful in initial stages of OA and could avoid muscular imbalance that causes the characteristic deformity of the thumb (dorsoradial subluxation). The treatment in women should be managed to improve the activity of the first dorsal interosseous muscle and in men it would be better to strength extrinsic muscles. Although our sample is larger than other studies, the osteoarthritis group should be more important and we did not analyze all the thumb muscles.

A-0460 PERI-IMPLANT RADIUS FRACTURES IN DENERVATED LIMBS FOLLOWING WRIST ARTHRODESIS FOR PAN-BRACHIAL PLEXUS INJURY

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Introduction: Pan-brachial plexus injury causes profound denervation, muscle atrophy, and disuse osteopenia of the affected upper limb. Reconstructive procedures such as trapezius transfer and wrist arthrodesis restore alignment and provide stability, but altered biomechanics and lack of protective sensation may predispose these limbs to fragility fractures. Peri-implant fractures proximal to wrist fusion constructs are uncommon and sparsely reported.

Aim: To report peri-implant radius fractures in denervated limbs following wrist arthrodesis for pan-brachial plexus injury.

Material & Methods: Two patients with pan-brachial plexus injury who had previously undergone wrist arthrodesis presented after trivial low-energy trauma. Clinical and radiographic evaluation was performed to assess fracture location, morphology, bone quality, and the condition of the arthrodesis construct.

Results: Both patients demonstrated diffuse osteopenia with intact wrist fusion implants. Radiographs revealed isolated

transverse fractures at the mid-diaphysis of the radius, located proximal to the fusion construct, consistent with peri-implant stress-riser fractures. No evidence of implant loosening or breakage was observed. The fracture patterns reflected the combined effects of disuse osteopenia, altered forearm load transmission following wrist fusion, and loss of protective sensation in the denervated limb.

Conclusions: Peri-implant radius fractures in denervated, arthrodesed limbs represent an under-recognized complication after reconstructive surgery for brachial plexus injury. Early awareness of this vulnerability is important for preventive counselling, careful rehabilitation, and follow-up planning in these high-risk patients.

A-0461 PERI-IMPLANT RADIUS FRACTURES IN DENERVATED LIMBS FOLLOWING WRIST ARTHRODESIS FOR PAN-BRACHIAL PLEXUS INJURY

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Introduction: Pan-brachial plexus injury causes profound denervation, muscle atrophy, and disuse osteopenia of the affected upper limb. Reconstructive procedures such as trapezius transfer and wrist arthrodesis restore alignment and provide stability, but altered biomechanics and lack of protective sensation may predispose these limbs to fragility fractures. Peri-implant fractures proximal to wrist fusion constructs are uncommon and sparsely reported.

Aim: To report peri-implant radius fractures in denervated limbs following wrist arthrodesis for pan-brachial plexus injury.

Material & Methods: Two patients with pan-brachial plexus injury who had previously undergone wrist arthrodesis presented after trivial low-energy trauma. Clinical and radiographic evaluation was performed to assess fracture location, morphology, bone quality, and the condition of the arthrodesis construct.

Results: Both patients demonstrated diffuse osteopenia with intact wrist fusion implants. Radiographs revealed isolated transverse fractures at the mid-diaphysis of the radius, located proximal to the fusion construct, consistent with peri-implant stress-riser fractures. No evidence of implant loosening or breakage was observed. The fracture patterns reflected the combined effects of disuse osteopenia, altered forearm load transmission following wrist fusion, and loss of protective sensation in the denervated limb.

Conclusions: Peri-implant radius fractures in denervated, arthrodesed limbs represent an under-recognized complication after reconstructive surgery for brachial plexus injury. Early awareness of this vulnerability is important for preventive counselling, careful rehabilitation, and follow-up planning in these high-risk patients.

A-0462 UNDERSTANDING PATIENT PERSPECTIVES OF THERAPIST-LED AND ADVANCED PRACTICE ROLES IN HAND TRAUMA: QUALITATIVE INTERVIEW STUDY

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Introduction: Hand trauma accounts for nearly one-third of UK emergency department attendances, with substantial clinical and socioeconomic consequences. To relieve pressure on emergency and surgical services, National Health Service (NHS) trusts are redesigning person-centred pathways and expanding allied health roles, including therapist-led models under the Advanced Clinical Practice (ACP) framework. Despite increasing adoption, there is limited qualitative evidence

on how patients experience therapist-led care in acute hand trauma. Understanding patient perspectives is essential to optimise pathway design, clarify professional roles and boundaries, and support safe, acceptable implementation across trauma service contexts in the NHS.

Aim: The aims of this qualitative interview study were to understand patient perspectives of (i) attending hand trauma clinic, (ii) advanced practice hand therapy-led services, and (iii) clinical outcome data collection methods (to support future quantitative research).

Material & Methods: Semi-structured 1:1 interviews were completed with patients recruited from a NHS Hand Unit in central London. Eligibility criteria were: aged ≥ 16 years, current patient in the Hand Unit with closed hand injuries (metacarpals distally) including surgical and non-operative management, capacity to give consent, and able to complete an English language interview including with an interpreter. The study was approved by the Trust Clinical Effectiveness unit (reference: 2025-0049-R). Interviews were audio recorded and transcribed. Data were analysed using reflexive thematic analysis. Transcripts were iteratively coded and organised into themes and subthemes with feedback from the clinical hand therapy team.

Results: Nineteen participants completed interviews (13 males, 6 females). The most common ethnic backgrounds were White British ($n=5$) and Indian ($n=5$). Eighteen participants reported English as their first language. Five interrelated themes were developed: (1) trust, understanding, and acceptance of professional roles; (2) communication and the patient journey along the pathway; (3) perceived quality, consistency, and clarity of information; (4) overall satisfaction and perceived outcomes; and (5) views on outcome measurement. Participants reported high satisfaction and strong trust in therapists, driven more by communication, professionalism, and perceived competence than by job title. While therapist-led care was broadly accepted, awareness of the scope of these roles and transparency about qualifications and supervision were seen as essential. Isolated concerns were raised about the oversight of staff in training and there were requests for more information about the referral pathway. Most participants were willing to contribute outcome data for research, but only when the purpose, use, and timings were clearly explained.

Conclusions: Therapist-led hand trauma services were identified as a valuable service. Participants were satisfied with hand therapists' communication and perceived expertise. Therapy-led services should ensure that the clinical pathway is clear for patients, there is consistent information about the injury across the pathway, and there are visible professional boundaries, transparent qualifications and formal supervision structure. These findings will inform further service development at our hospital and support wider implementation of advanced practice models in hand trauma care.

A-0463 SURGICAL TREATMENT OF CHRONIC MALLET FINGER WITH A TEMPORARY KIRSCHNER WIRE FIXATION: A CASE SERIES

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Introduction: Mallet finger is a common result of an injury to the tip of a finger leading to an inability to fully extend the distal interphalangeal (DIP) joint, leaving the affected finger in a characteristic flexed position. In the acute phase, mallet finger is most often treated conservatively with a full-time 6-weeks splint. However, 27-55% of closed ruptures fail to respond to splintage resulting in a chronic mallet finger. Although various surgical and non-surgical treatment

methods have been proposed for chronic cases, a gold standard has yet to be established, making it a continued focus of research interest.

Aim: This retrospective case series, evaluates a 3-month temporary Kirschner wire (K-wire) fixation as a surgical treatment for chronic mallet finger, defined as persisting DIPJ extension lag >12 weeks post- injury. Only patients with prior failed conservative splinting of 6 weeks or more were included.

Material & Methods: Four patients (three men, aged 50-61 years) were treated at Gentofte Hospital, Denmark, between January 2023 and January 2024. Patients received surgical treatment for chronic mallet finger by immobilization of the distal interphalangeal joint for 3-months with a 1.6 mm K-wire. All patients had previously undergone minimum six weeks unsuccessful conservative splint treatment. Patients had a clinical examination before surgery and a follow-up examination up to 27 months post-surgery (mean follow-up 22 months).

Results: All four patients regained terminal extensor tendon function. Mean extension lag was decreased from 33° (range 20-45) to 13° (range 0-25). No infections, implant failure or secondary surgery had occurred. No patients reported pain at rest. Two patients experienced slight difficulties in their daily activities and pain during repeated movements in relation to the operated finger. Evaluation using a patient- reported outcome measure was obtained by using patient Patient Rated Wrist/Hand Evaluation (PRWHE) and Patient-Specific Functional Scale (PSFS).

Conclusions: Temporary K-wire transfixation of the DIP joint may be a viable treatment option for patients with chronic mallet finger who have had unsuccessful splint treatment.

A-0464 HOURGLASS-LIKE FASCICULAR CONSTRICTIONS IN IDIOPATHIC ANTERIOR AND POSTERIOR INTEROSSEOUS NERVE PALSY AND NEURALGIC AMYOTROPHY: CLINICAL CHARACTERISTICS AND PATHOPHYSIOLOGICAL CONSIDERATIONS Shigeru Kurimoto¹, Michiro Yamamoto²

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Introduction; In peripheral nerve disorders without obvious mechanical stimulation or trauma, hourglass-like constrictions of nerve fascicles are occasionally observed. However, the pathophysiology of these constrictions remains uncertain. Neuralgic amyotrophy (NA), including distal phenotypes such as anterior and posterior interosseous nerve palsy, is classified as an inflammatory neuropathy, with proposed mechanisms involving immune-mediated inflammation, mechanical vulnerability, and possible genetic predisposition.

Aim; To examine idiopathic anterior interosseous nerve (AIN) and posterior interosseous nerve (PIN) palsy cases and to discuss the potential pathophysiology of hourglass-like constrictions based on clinical and pathological findings.

Material & Methods; Between 2004 and 2023, 118 patients were diagnosed at initial presentation with idiopathic AIN or PIN palsy at our institution. Forty-seven patients with suspected direct nerve injury or a follow-up period of less than six months, among other exclusion criteria, were excluded. The remaining 71 patients were analyzed with respect to clinical characteristics, surgical findings, pathological results, and postoperative recovery.

Results; Of the 71 patients, 41 had AIN palsy, 29 had PIN palsy, and 1 had combined AIN and PIN palsy. The mean age was 49.8 years (range 8–78 years), and 41 patients (58%) were male. Antecedent events, including infections or surgical procedures at other sites, were identified in 37 patients (53%). More than half of the patients experienced pain prior to the onset of motor weakness. Among 30 patients who underwent interfascicular neurolysis, hourglass-like constrictions were identified in 16 cases (53%). Perineurial pathological examination revealed inflammatory cell infiltration in 33% of specimens. No significant difference in postoperative muscle strength recovery was observed between patients with and without constrictions. Two patients presented with the classic phenotype of NA affecting the shoulder girdle, and

similar constrictions were found in the brachial plexus during surgery.

Conclusions; Hourglass-like constrictions were found in more than half of surgically treated idiopathic AIN and PIN palsy cases, with inflammatory cell infiltration observed in one-third of specimens. In half of the constriction cases, antecedent events were present, including vaccination and surgery at other sites. The series also included bilateral cases, combined AIN and PIN palsy, multiple nerve involvement, and a familial occurrence. These findings indicate that mechanical stress alone is insufficient to explain the pathogenesis. Classic NA, considered part of the same disease spectrum, is classified as an inflammatory neuropathy, with genetic mutations and autoantibodies reported in some cases, suggesting an immune-mediated mechanism. The identification of similar constrictions in the brachial plexus in NA supports the need to incorporate an immunological perspective into the understanding of their pathophysiology.

A-0465 ANATOMICAL VALIDATION OF THE SONOGRAPHIC DETECTION OF SMALL NERVOUS STRUCTURES

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Introduction: Ultrasound is a primary imaging modality for diagnosing and managing nerve-related injuries, particularly for identifying peripheral nerve locations. However, its accuracy and reliability in surgical applications remain insufficiently explored, potentially limiting its utility in nerve surgery.

Aim: This study aims to assess the precision of ultrasound in identifying upper limb peripheral nerves by comparing ultrasonographic findings with direct human cadaveric dissection.

Material & Methods: Fourteen fresh-frozen upper limb specimens were examined in February 2023. Ultrasound assessments were performed by two experienced musculoskeletal radiologists using three linear probes (15 MHz, 24 MHz, and a 22 MHz hockey stick probe). Seven peripheral nerves were identified and marked using dye injections. Subsequent dissections were conducted under loupe magnification by hand surgeons.

Results: The recurrent motor branch of the median nerve exhibited the lowest discrepancy (mean 1.014 ± 1.459 mm) and the highest accuracy (64.29% of specimens). The greatest discrepancy was observed in the branch of the musculocutaneous nerve to the brachialis (mean 5.114 ± 3.758 mm). The interrater correlation coefficient (ICC) varied across nerve sites, ranging from -0.6298 to 0.795 , with the highest ICC observed in the superficial branch of the ulnar nerve (0.795 , 0.066).

Conclusions: These findings suggest that ultrasound is a valid and effective tool for identifying peripheral nerve branches in the upper limb, particularly for superficial nerves. Improved accuracy in ultrasound-guided nerve identification may enhance surgical precision and reduce complications in nerve-related procedures.

A-0466 INTEROBSERVER RELIABILITY AND MEASUREMENT INTERCHANGEABILITY OF TOTAL ACTIVE MOTION (TAM) OF FINGERS USING NON-PARAMETRIC PASSING–BABLOK ORTHOGONAL REGRESSION ANALYSIS

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Introduction: Total active motion (TAM) is a key clinical measure for assessing outcomes in hand surgery. While interobserver reliability is often evaluated using absolute agreement coefficients such as the intraclass correlation coefficient (ICC), these indices quantify consistency but do not determine whether two observers' measurements are interchangeable. Reliable and interchangeable TAM measurements are essential for multicenter studies, studies with more than one observer for outcomes assessment and reduce the workload in clinical practice.

Aim: The purpose of this study was to assess Interobserver Reliability and Measurement Interchangeability of Total Active Motion (TAM) of Fingers Using non-parametric Passing–Bablok Orthogonal Regression Analysis.

We hypothesized that TAM measurements of the fingers obtained independently by two trained hand therapists would demonstrate no significant constant or proportional bias, indicating that their measurements are interchangeable.

Material & Methods: In this cross-sectional study, 47 patients (39 with hand pathology) underwent TAM measurement of the fingers. Two trained observers—a physiotherapist and an occupational therapist—performed measurements independently and blinded on the same day using standardized goniometric techniques.

Systematic bias between observers was assessed using a nonparametric Passing–Bablok orthogonal regression model. The regression equation was defined as $Y = A + BX + \epsilon$, where A represents constant bias, B proportional bias, and ϵ random error. The two measurements were considered comparable and interchangeable when the 95% confidence intervals for $H_0(A) = 0$ and $H_0(B) = 1$ included these values.

Results: Passing–Bablok regression showed no statistically significant constant or proportional bias between observers. For the index finger, $A = 0$ (95% CI: -60.59 to 5) and $B = 1.00$ (95%

CI: 0.92 to 1.14); for the middle finger $A = -0.10$ (95% CI: -52.65 to 5) and $B = 1.02$ (95%

CI: 1 to 1.24); for the ring finger, $A = -28.57$ (95% CI: -62.14 to 5) and $B = 1.14$ (95% CI: 1 to 1.29); and for the little finger, $A = 5.00$ (95% CI: -36.67 to 33.13) and $B = 1.00$ (95% CI: 0.88 to 1.167). None were statistically significant ($p > 0.05$).

Conclusions: TAM measurements of the fingers did not show constant or proportional bias between trained therapists. Measurements can be considered interchangeable, supporting TAM as a robust and reproducible outcome measure for clinical and research applications. The use of Passing–Bablok orthogonal regression provides a complementary method to traditional reliability analysis, improving the assessment of method interchangeability.

A-0467 OVINE TENDON COLLAGEN AS DERMAL SUBSTITUTE FOR HAND WOUND COVERAGE

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Introduction: Deep-space infection of the hand can be associated with a varying degree of morbidity. Management will always start with an incision and drainage of the affected hand, followed by appropriate intravenous antibiotic therapy and mobilisation of the joint post-operatively. In order to achieve a good outcome, wound bed preparation is vital as the

first stage of wound healing. Ovine Tendon Collagen (OTC) can be a new alternative source of collagen that can be used as a bio scaffold for skin defect coverage.

Aim: In this study we will be focusing on how OTC can be used as dermal substitute for wound coverage in hand wound.

Material & Methods: This case report presents a 65-year-old female with a post-incision and drainage wound complicated by flap necrosis. Following thorough wound debridement and absence of infection, a 5x5 cm OTC scaffold was applied to the wound bed and secured with absorbable sutures. Postoperatively, the wound was managed with daily dressings using Bactigras and Hydrocyn Aqua. Healing progress was assessed clinically over three weeks.

Results: The wound demonstrated early granulation tissue formation and reduction in size within one week of OTC application. The patient showed excellent uptake of the collagen scaffold without adverse effects. Full wound closure was achieved by the end of three weeks without the need for further surgical intervention.

Conclusions: OTC serves as an effective dermal substitute in post-infective hand wounds with tissue loss, offering a safe, biocompatible alternative that supports rapid wound healing. Its suitability for patients with religious restrictions further enhances its clinical utility. Continued research and wider clinical application could validate its role in complex wound management.

A-0468 WALANT TECHNIQUE FOR PERCUTANEOUS PINNING OF DISTAL RADIOULNAR JOINT

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Introduction: Wide Awake Local Anaesthesia No Tourniquet (WALANT) technique is increasingly getting popular and is used to undertake many procedures in hand surgery. We describe WALANT as a technique for percutaneous pinning of distal radioulnar joint.

Aim: To describe the technique and outcomes of using the WALANT method for percutaneous K-wire stabilization of an isolated distal radioulnar joint dislocation.

Material & Methods: Percutaneous K-wire fixation performed under WALANT. The WALANT solution (12 ml) consisted of 0.1 ml adrenaline, 5 ml saline, 5 ml 2% lignocaine, and 1 ml sodium bicarbonate. Local anaesthesia was injected at the planned K-wire entry point: 2 ml into the subcutaneous tissue followed by 3 ml into the periosteum after 45 seconds. Another 5 ml was injected into the DRUJ from the dorsal wrist. No local anaesthesia was given at the radial exit point of the wire. After a 30-minute waiting period, the patient was brought to theatre. The DRUJ was reduced with direct pressure over the ulnar head. A 1.6 mm K-wire was passed percutaneously from ulna to radius across all four cortices. Final wire position and reduction were confirmed with fluoroscopy.

Results: The procedure was completed entirely under WALANT with a pain score of 0/10 throughout. The patient demonstrated mild pre-procedural tachycardia (mean HR 105 bpm) due to anxiety, which normalized after wire insertion (mean HR 81 bpm). Despite the absence of local anaesthesia at the radial exit point, the patient did not experience any discomfort during wire passage through this area.

Conclusions: WALANT is a practical, effective, and cost-friendly anaesthetic option for percutaneous DRUJ pinning. It provides excellent pain control, facilitates intraoperative clinical assessment through patient interaction, and eliminates the need for general anaesthesia or a tourniquet. This technique can be safely adopted in centres performing wrist and hand surgery to reduce operative time and resource utilization.

A-0470 HUMAN AMNIOTIC MEMBRANE WRAPPING IN SECONDARY PERIPHERAL NERVE SURGERY: PRECLINICAL EVIDENCE AND PRELIMINARY CLINICAL OUTCOMES

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Introduction: Secondary surgery on peripheral nerves, for persistent neuropathic symptoms postoperative scarring or nerve injury, remains a demanding procedure due to dense endo and perineural fibrosis and loss of normal gliding planes. Standard revision neurolysis or secondary repair restores nerve mobility and continuity but does not reliably prevent new adhesions and endoneural fibrosis. Those may limit recovery and contribute to recurrent symptoms. Human amniotic membrane (HAM) has gained growing interest as a biological adjunct owing to its antiadhesive, anti-inflammatory, and neurotrophic properties. Preclinical studies suggest that HAM can reduce scar formation and promote a more physiological healing environment

Aim: To evaluate the biological rationale and preliminary clinical effectiveness of human amniotic membrane wrapping following revision surgery on peripheral nerves. To integrate results from a preclinical animal model with early outcomes from a single-centre pilot patient series **Material & Methods:** A preclinical study was first performed. We reproduced an unilateral neurotmesis in the left sciatic nerve of an animal model, followed by an end-to-end neurorrhaphy enhanced with distinct surgical adjuncts. After controlled exposure and injury, animals were randomized to receive either HAM wrapping, Reaxon® chitosan-based or no adjunctive treatment. Macroscopical, Histological and Immunohistochemical analysis were performed at 6 weeks.

Building upon these findings, a prospective monocentric clinical pilot study was conducted involving ten consecutive patients undergoing secondary peripheral nerve surgery for revision neurolysis or secondary repair. After complete external neurolysis or repair, the treated nerve was wrapped circumferentially using a sterile cryopreserved HAM patch, applied without sutures. Clinical evaluation was performed preoperatively and at 1, 3, and 6 months postoperatively. Outcomes measures included Visual Analog Scale (VAS) of pain, Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) score, two-point discrimination, Semmes–Weinstein monofilaments testing and grip strength.

Results: HAM-treated nerves on animals demonstrated significantly reduced perineural fibrosis according to Petersen scale and more organized collagen structure compared with controls. Lower inflammatory cell density and improved preservation of axonal architecture were observed at histological and IHC analysis at 6 weeks, supporting the potential protective role of HAM after nerve repair or neurolysis.

Clinically, patients treated with HAM showed encouraging early improvements. Median VAS pain scores decreased by 2.2 points at 3 months, with further stabilization at 6 months. QuickDASH scores improved by an average of 14 points, reflecting meaningful functional recovery. Sensory testing demonstrated faster normalization of touch thresholds compared to literature. No adverse reactions, infections, or complications related to the membrane were recorded.

Conclusions: Although these findings are preliminary and based on a small cohort, they highlight the promising potential of HAM in secondary peripheral nerve surgery and support the need for larger, controlled clinical studies to expand these results

A-0471 CASE OF ACUTE NON-TRAUMATIC FOREARM COMPARTMENT SYNDROME

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Introduction: Compartment syndrome of forearm without known etiology is very rare condition which creates diagnostic and treatment difficulties. Acquired hemophilia could be one reason for that. In some cases, the bleeding in muscle causes compartment syndrome. Due to the fact, that this disease is very rare and only case reports are discussed in the literature, it is difficult to establish treatment algorithm. However, it is not clear whether fasciotomy should be performed for the compartment syndrome caused by acquired hemophilia because of the risk of bleeding.

Material & Methods: A 32-year-old woman was admitted with severe pain of the right forearm with no preceding traumatic event. The right forearm was obviously swollen, and stretch pain was observed. Activated partial thromboplastin time (aPTT) was prolonged to 42.4 s. Fasciotomy was performed, and hematoma was observed in the volar compartment. Postoperative laboratory examinations revealed a low level of factor VIII (FVIII) activity (7.4%) and a high level of FVIII inhibitor 2.10 bethesda units/mL). Acquired hemophilia A was diagnosed. We perform transfusion of NovoSeven. Hemostasis was achieved 7 d after fasciotomy. With prednisolone, FVIII activity and aPTT recovered gradually. Final function of the hand was excellent.

Conclusions: Fasciotomy resulted in excellent function of the hand in a case of non-traumatic compartment syndrome caused by acquired hemophilia, but life-threatening bleeding occurred. Preparation of sufficient blood transfusion, perioperative administration of recombinant activated clotting factor VII and prednisolone, and on time fasciotomy is critical for successful treatment.

A-0472 THE IMPACT OF TFCC INJURY ON DORSAL ULNAR SUBLUXATION : CORRELATION BETWEEN DRUJ INSTABILITY SEVERITY ON MRI AND TRIANGULAR FIBROCARILAGE COMPLEX INJURY – A CLASSIFICATION OF DRUJ INSTABILITY

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Introduction: The recent studies reported the correlation between dorsal ulnar head subluxation on MRI and triangular fibrocartilage complex injury. In the current, there are classifications of TFCC injury depended on cause, location, morphology and degree of injury.

Aim: We aimed to describe a modified measurement method and a new classification of DRUJ instability.

Material & Methods: The data of 119 patients who underwent wrist MRI in neutral and pronated position were retrospectively reviewed between January 2019 and October 2025. 77 MRI images of case who had arthroscopic-confirmed TFCC injuries compared to 42 MRI images of a control group with similar MRI measurement method. Intraclass correlation coefficients (ICCs), Kappa coefficient, Fisher's exact test, Wilcoxon rank-sum test, Pearson correlation, and ROC analysis were performed to analyze demographic and radiographic variables.

Results: The interobserver and intraobserver ICCs for degree of dorsal ulnar subluxation (0.984, 0.978) and UH-L distances (0.989, 0.961) were excellent agreements. Kappa coefficient for interobserver reliability in group of subluxation was substantial agreement ($K = 0.651$; $p < 0.001$). Result of Logistic Regression for predicting TFCC group revealed an Odd of 4.3 means ($p = 0.005$) in group B and group C. Pearson's correlation showed a strong, negative correlation between dorsal

ulnar subluxation and UH-L distances ($r = -0.771$; $p < 0.001$). The ROC analysis for degree of dorsal ulnar subluxation showed a cut-off value 16.32%, a sensitivity 77.9% and a specificity 61.9%.

Conclusions: This modified measurement method on MRI for classification of DRUJ instability showed a significant predicting TFCC injuries in moderate to high DRUJ instability. The correlation between dorsal ulnar subluxation and UH-L distances was a helpful evidence for a clinical examination and indicating diagnostic wrist arthroscopy in cases of TFCC injuries.

A-0473 TREATMENT ALGORITHM FOR SURGICAL TREATMENT OF SPASTIC FLEXION CONTRACTURE OF THE WRIST

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Introduction: Surgical treatment of spastic wrist flexion contracture can defer regarding of the degree of muscle spasticity, bone and soft tissue contracture and paralysis. Partial selective neurectomy of motor nerves has been shown to decrease spasticity in the targeted muscles. This procedure can be combined also in clinical cases with more rigid deformity correction where soft tissue and bone surgeries are performed. In cases of spasticity-related joint deformities, joint release, arthrodesis, tendon lengthenings, tendon transfers, tendon rerouting and arthrodesis may be used. Main purpose of surgery in cases of spastic wrist flexion contracture is to get better function and posture of the affected hand so to result in improvement of daily activities and hygiene.

Aim: To present combination of surgical techniques for treatment of different stages of spastic wrist flexion contracture

Methods: The inclusion criteria of the patients in our series were spastic upper limb secondary to stroke, traumatic brain injury, and cerebral palsy. Recorded measurements were patient's age at surgery, gender, etiology of the spasticity. Several surgical methods were used such as selective neurotomy, tendon transfer, tendon elongation, proximal row carpectomy and wrist arthrodesis. The results were studied by hand function comparison pre and postop; the first follow-up occurred between 1 and 6 months, and at the last follow up at around 12 months to study the durability of the results based on several criteria: spontaneous position, range of motion, muscle tone, spasticity according to functional evaluation (House scale).

Results: The results were collected as we recorded clinical outcome of hand function straight after surgery, two weeks post op and 1-6 months postoperatively as the early follow up. Mild cases needed selective neurotomy and tendon transfers. As for more severe cases proximal row carpectomy and wrist arthrodesis was needed to correct wrist flexion deformity in order to get better function of the hand.

Conclusion: Management of spasticity is multidisciplinary and involves physical therapists, occupational therapists, physiatrists and surgeons. Surgical treatment plays big role in upper limb spasticity cases in the recent years. There are many available operative procedures such as selective neurectomy, tendon and bone surgeries, but every patient must be approached by its individual features. Correction of spastic wrist flexion deformity is crucial for gaining better motion of the fingers in order to get improvement of hand function.

A-0475 CROSS-SECTIONAL STUDY COMPARING ACCIDENTAL AND SELF-HARM HAND INJURIES: DEMOGRAPHIC, CLINICAL, AND PSYCHOLOGICAL FACTORS

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Introduction: Hand injuries are a major cause of functional impairment with personal, social, and economic consequences. While most are accidental, a notable proportion result from intentional self-harm, often linked to anger control problems or psychological imbalance of the individuals. These two types of hand injuries would have diverse backgrounds of the patients, which in turn cause different outcomes.

Aim: To identify and compare demographic, clinical, and psychosocial features of patients with accidental versus self-harm-related hand injuries

Material & Methods: This cross-sectional study included 54 patients who underwent surgical intervention for hand injuries and were referred for hand therapy. Participants were grouped as accidental injury (n=38) or self-harm injury (n=16) according to their type of injury. Demographic and clinical data (age, sex, marital status, education, injury history, alcohol use, injured structures) and psychological assessments (Attitudes Towards Violence Scale [ATVS], Beck Depression Inventory [BDI], Beck Anxiety Inventory [BAI]) were collected. Non-parametric tests were used for comparisons due to unequal group sizes. Post-hoc power analysis was also applied to determine the sample size adequacy.

Results: Self-harm patients were more often single ($p=0.021$), had higher education levels ($p=0.012$), and most patients in this group had no prior injury history ($p=0.033$). Injured anatomic structures were tendon, bone, nerve and vessels and their distribution was similar across the groups. No significant differences were found in BDI or BAI scores between the groups. ATVS scores showed a non-significant trend toward higher values in the self-harm group. Post-hoc analysis based on ATVS comparison demonstrated that our study has 99% power (effect size 1.26).

Conclusions: Self-harm-related hand injuries display distinct demographic and psychosocial profiles compared to accidental injuries, underscoring the need for early psychological screening and multidisciplinary rehabilitation. Incorporating mental health assessment into post-injury care may help reduce recurrence and improve physical and psychological balance of the patients.

A-0476 USE OF HEMI-HAMATE AUTOGRAFT IN FRACTURE-DISLOCATIONS OF THE PROXIMAL INTERPHALANGEAL JOINT OF THE LONG FINGERS

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Introduction: Fracture-dislocations of the proximal interphalangeal (PIP) joint of the long fingers are complex injuries, frequently associated with residual stiffness and early degenerative arthritis. Reconstruction of the F2 base using an autograft harvested from the hamate and stabilized with mini-screws allows restoration of the defect and re-establishment of joint congruence.

Aim: The aim of this study was to evaluate clinical and functional outcomes.

Material & Methods: Nine patients (mean age 40 years) treated between 2020 and 2025 for PIP fracture-dislocation with an osteochondral defect >50% of the F2 base (3 acute injuries, 6 subacute injuries) were included. All underwent

arthroplasty with an autologous hamate graft fixed with mini-screws. Mean follow-up was 9 months. Parameters analyzed included radiographic consolidation, clinical outcomes, and complications.

Results: Osseous integration of the graft was observed in all cases. The mean active range of motion of the PIP joint was 85°. Five patients achieved excellent functional recovery, as assessed through DASH and PWRE questionnaires. The mean recovery time was 2 months. Complications included axial deviation (2–7°) in two cases, and limited range of motion (0–10°) in one patient requiring surgical revision (tenoarthrolysis).

Conclusions: Hemi-hamate reconstruction is a valid surgical option for both acute and subacute injuries. Our results are favorable and consistent with the literature. Early intervention is essential to achieve good outcomes. Larger studies are desirable to validate these preliminary findings.

A-0477 ACCURACY AND PRECISION OF CT-RSA MIGRATION MEASUREMENTS OF THE TOUCH® DUAL MOBILITY TRAPEZIOMETACARPAL PROSTHESIS COMPARED TO MBRSA: AN ANATOMIC SPECIMEN STUDY

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Introduction: In a small joint such as the trapeziometacarpal (TMC) joint, measuring prosthesis migration is still a challenge. The current gold standard is Roentgenstereometric Analysis (RSA), which requires the implantation of bone markers. An upcoming method to measure prosthesis migration is Computed Tomography based RSA (CT-RSA). This method avoids the difficulties of marker distribution, in a small bone such as the trapezium as it does not require the implantation of bone markers. However, the accuracy of CT-RSA has not yet been assessed for migration analysis of the TMC implant. The aim of this study is to validate the accuracy, precision and reliability to measure migration of a TMC prosthesis using CT-RSA compared to the gold standard model-based RSA.

Method: An anatomic specimen of the trapezium and first metacarpal bones with an implanted TOUCH® TMC prosthetic (KeriMedical, Geneva, Switzerland) was positioned in a micromanipulator. The first metacarpal was translated in 9 steps along the x-, y- and z-axis until 2.5 mm and rotated in 9 steps around the longitudinal y-axis until 5.0°. Manipulations were applied for translations and rotations separately. At each position, a CT-scan was made. After all CT-scans were made, the tantalum beads were attached and measurements were repeated with RSA radiographs. All CT-scans were analyzed with V3MA software (RSAcore, LUMC, Leiden, The Netherlands) and all roentgen images were analyzed with MBRSA software (RSAcore, LUMC, Leiden, The Netherlands) to calculate translations and rotations of the cup and stem compared to the opposing bone. Measurements were repeated by one analysts one month after the initial analysis, and all measurements were performed by two analysts to obtain intra- and inter-observer reliability.

Results: A statistically significant difference was found between the applied manipulation and measured migration in V3MA for the z-axis translation of the stem 0.027mm (95%LOA -0.017; 0.070; p=0.009) and for the y-axis translation -0.010mm (95%LOA -0.024; 0.004; p=0.005) and z-axis translation -0.009mm (95%LOA -0.027; 0.010; p=0.011) of the cup. All variables of MBRSA had a significant difference, except for the y-axis translation -0.001mm (95%LOA -0.078; 0.093; p=0.721) of the stem and for the y-axis translation 0.000mm (95%LOA -0.023; 0.023; p=0.959) and the z-axis translation 0.005mm (95%LOA -0.156; 0.165; p=0.959) of the cup. Compared to MBRSA, V3MA has lower precision intervals (1.96 x SD) with smaller confidence intervals in all variables except for the Y-axis rotation of the cup which was 1.56° in V3MA and 0.27° in MBRSA. The intra-observer reliability is higher in V3MA compared to MBRSA, while inter-observer reliability is comparable. The translations all had good to excellent intra- and inter-observer reliability in V3MA. The rotations had

good to excellent intra-observer reliability in the stem and poor to moderate in the cup. The rotations of both components had poor intra- and inter-observer reliability in MBRSA and poor inter-observer reliability in V3MA.

Conclusion: This study concludes that V3MA is a valid method to measure migration of implants in the thumb with a slightly better accuracy, precision, inter- and intra-observer reliability compared to MBRSA. However, caution is still advised when measuring rotations of the cup.

A-0478 TRANS-ULNAR FRACTURE-DISLOCATION OF THE ELBOW WITH RADIAL HEAD FRACTURE: LCP MINIPLATE TECHNIQUE

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Introduction: Trans-ulnar fracture-dislocation associated with radial head fracture is a challenging injury characterized by combined bony and ligamentous disruption. Proper management of the radial head is critical for maintenance of elbow stability and prevention of post-traumatic arthrosis. However, ORIF of comminuted radial head fractures in fracture-dislocation settings may yield suboptimal stability and functional outcomes. Here, we introduce a novel technique that allows radial head fixation in the dislocated state and subsequent ulnar fixation after elbow reduction, using fracture line mapping of the coronoid and olecranon to guide planning.

Aim: We aimed to evaluate clinical outcomes of the LCP miniplate fixation technique for trans-ulnar fracture-dislocation with concomitant radial head fracture.

Material & Methods: From July 2001 to July 2018, 15 consecutive patients with trans-ulnar fracture-dislocation and radial head fracture were treated surgically at a single tertiary center. Posterior-type injuries accounted for 13 cases (86.7%). Among them, 6 patients (40%) were treated with an LCP miniplate fixation strategy. Patients with ipsilateral distal humerus fracture or prior elbow pathology were excluded. Postoperatively, the elbow was immobilized for 4 weeks, followed by guided range-of-motion rehabilitation. Clinical outcomes were assessed using flexion-extension arc, forearm rotation arc, and Mayo Elbow Performance Index (MEPI).

Results: At a mean follow-up of 36.5 months (12–109), the mean flexion-extension arc was 115° (90–135°), flexion contracture averaged 12° (0–30°), and mean forearm rotation arc was 130° (90–155°). The mean MEPI score was 91 (80–95), indicating good-to-excellent function. No cases of instability or osteonecrosis were observed. One patient experienced postoperative limitation of pronation requiring implant removal and capsular scar release, which improved motion.

Conclusions: LCP miniplate fixation for trans-ulnar fracture-dislocation with concomitant radial head fracture provides reliable joint stability and favorable clinical outcomes while preserving the native radial head. This fixation strategy may represent a valuable alternative to early radial head arthroplasty in complex elbow fracture-dislocations.

A-0479 RADIAL HEAD FIXATION VERSUS ARTHROPLASTY IN THE TREATMENT OF TERRIBLE TRIAD INJURIES OF THE ELBOW: A RETROSPECTIVE COMPARATIVE STUDY

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Introduction: Management of terrible triad injuries of the elbow remains challenging. The choice between open reduction and internal fixation (ORIF) of the radial head and radial head arthroplasty is often guided by fracture comminution and surgeon preference.

Aim: This study aimed to compare functional and clinical outcomes between these two strategies.

Material & Methods: A retrospective review was conducted of 66 patients treated for terrible triad injuries between 2010 and 2022, with a minimum 2-year follow-up. Forty-two patients underwent ORIF and 24 received radial head arthroplasty. Mean ages were 47.2 ± 12.6 and 53.8 ± 11.4 years, respectively. Mean follow-up was 46 months (range, 24–66). Outcomes included MEPS, DASH, VAS for pain, range of motion, complications, and reoperations. Statistical significance was set at $p < 0.05$.

Results: Coronoid fixation was performed in 88% of patients overall. Concomitant injuries were recorded in 21% of the ORIF group and 17% of the arthroplasty group. The arthroplasty cohort demonstrated significantly lower VAS pain scores (1.9 ± 1.5 vs. 2.8 ± 1.9 , $p = 0.04$) and greater range of motion (flexion-extension $124^\circ \pm 18^\circ$ vs. $110^\circ \pm 22^\circ$, $p = 0.03$). MEPS (89.8 ± 9.1 vs. 86.5 ± 10.8 , $p = 0.21$) and DASH (15.4 ± 10.1 vs. 18.7 ± 11.6 , $p = 0.28$) showed comparable improvement. Complication rates were 33% for ORIF and 17% for arthroplasty ($p = 0.14$), with reoperations in 14% and 8%, respectively ($p = 0.46$). Monopolar prostheses were used in 63% of arthroplasties and bipolar in 37%; both designs provided satisfactory mid-term results.

Conclusions: Radial head arthroplasty provided equivalent stability and functional outcomes to fixation, with superior pain relief and motion restoration. Both monopolar and bipolar prostheses yielded comparable results, supporting arthroplasty as a reliable option for comminuted radial head fractures in terrible triad injuries.

A-0480 DOES CONCURRENT EXTENSOR CARPI ULNARIS TENDON PATHOLOGY INFLUENCE OUTCOMES OF TFCC FOVEAL REPAIR?

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Introduction: The triangular fibrocartilage complex (TFCC) provides ulnar wrist stability, and tears of its foveal attachment can cause ulnar-sided wrist pain and grip weakness. The extensor carpi ulnaris (ECU) tendon sheath is closely connected to the TFCC, and ECU problems (such as tenosynovitis or subluxation) often occur alongside TFCC foveal tears.

Aim: We examined whether untreated ECU pathology at the time of TFCC foveal repair influences postoperative results. We hypothesized that concurrent ECU pathology would impair functional recovery after foveal fixation.

Material & Methods: We conducted a retrospective review of 111 patients who underwent transosseous TFCC foveal repair between January 2013 and December 2023. Patients were divided into two groups: those with preoperative ECU pathology (ECU tenosynovitis, subluxation on exam/imaging, or prior glucocorticoid injection, $n = 18$) and those without ($n = 93$). Primary endpoints included the qDASH score and the visual analog scale (VAS) for pain during activity, measured

preoperatively and at 3, 6, 12, and 24 months postoperatively. Complications and reoperation rates were also evaluated. Group differences were analyzed using independent Student's t-tests (for continuous variables) and chi-square or Fisher's exact tests (for categorical variables), with $p < 0.05$ indicating statistical significance.

Results: The two groups were similar in age, sex distribution, and comorbidities. Mean preoperative scores did not differ significantly. Postoperatively, the mean qDASH and VAS for pain improved significantly; however, there was no difference between the two groups at any time point. At 24 months, the mean qDASH was 17.77 (95% CI: 18.1; 30.98) in the ECU pathology group and 24.54 (95% CI: 18.1; 30.98) in the unaffected group ($p = 0.27$). Postoperative complications and reoperation rates were low and similar across groups. No patients in the ECU pathology group required ECU-stabilizing surgery after foveal TFCC fixation, despite preoperative ECU issues.

Conclusions: Contrary to our hypothesis, patients with concurrent ECU pathology did not have worse outcomes after TFCC foveal repair. These findings suggest that isolated TFCC repair provides symptom relief regardless of pre-existing ECU tendon problems. However, due to the small ECU pathology cohort and the study's retrospective design, further prospective research is needed to determine whether ECU pathology should influence surgical planning.

A-0481 RESTORING THE THUMB'S POWER: MID- TO LONG-TERM OUTCOMES OF FLEXOR TENDON TRANSFER FOR BLAUTH TYPE II AND IIIA HYPOPLASIA – A COMPARATIVE ANALYSIS

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Introduction: Hypoplastic thumb, particularly Blauth types II and IIIA, presents a significant functional challenge, characterized by absent or severely impaired opposition, which necessitates surgical intervention to restore pinch and grip function. While different surgical techniques are employed, the transfer of the ring finger FDS for opponensplasty is a preferred choice in many centers.

Aim: The primary purpose of this study was to evaluate the medium-to-long-term functional and aesthetic outcomes of ring finger Flexor Digitorum Superficialis (FDS) tendon transfer for the treatment of Blauth type II and IIIA hypoplastic thumbs. Furthermore, the study aims to critically compare our institutional results with those reported in the international literature.

Material & Methods: This retrospective case series included 15 thumbs in 13 pediatric patients diagnosed with Blauth Type II or IIIA hypoplastic thumb, who underwent reconstruction using the Flexor Digitorum Superficialis (FDS) tendon transfer from the fourth digit.

All procedures were performed by the same senior surgeon between 2013 and 2025 using a standardized surgical technique. The mean age at the time of surgery was 4.5 years old [1.4-14]. The mean follow-up period was 5.5 years [1-12 years]. Functional assessment included objective measures such as the Kapandji Opposition Score and grip/pinch strength testing. Patient-reported outcomes were evaluated using the Pediatric Outcomes Data Collection Instrument (PODCI) to assess overall function and quality of life.

Results: At a mean follow-up of 5.5 years, all 15 reconstructed thumbs demonstrated functional stability and improved opposition. The mean Kapandji score was 7.8 [4-10], pinch strength averaged 45% compared to the contralateral, unaffected hand. Patient and parental satisfaction was high regarding both the functional and aesthetic outcomes with the PODCI global score 85 (range 45–100), PODCI happiness score 84 (range 20–100). Two patients experienced minor complications: one patient required secondary surgery for first web space deepening (Z-plasty) and FDS tenolysis, and another underwent excision of a keloid.

Conclusions: The fourth finger FDS tendon transfer is a reliable and effective technique for restoring opposition and function in Blauth type II and IIIA hypoplastic thumbs, providing high levels of patient and parental satisfaction in the medium-to-long term. Our outcomes, showing stable opposition and predictable results with low complication rates, are comparable to those reported in the international literature, supporting the use of this specific approach as a robust option for complex thumb reconstruction.

A-0482 DEVITALIZED BONE OF THE NECROTIC THUMB AFTER FAILED THUMB REPLANTATION USED FOR EARLY THUMB RECONSTRUCTION

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Introduction: The thumb is the most important digit and its loss equals a loss of 40% of the hands function. Nowadays the gold standard procedure after thumb amputation is replantation procedure (independently of the mechanism of its amputation). Not every thumb replantation ends with its survival. There are many methods of late reconstructions of the thumb amputation like wrap around flap from the big toe, deepening of the first webspace of the hand, distraction lengthening of the first metacarpal, osteoplastic procedures and others.

Material & Methods: The authors present two cases of thumb reconstruction after failed replantation procedure using the method of preservation of devitalized bone of necrotic thumb phalanges (early osteoplastic procedures). The first patient – a 35 year old smoker working with a saw sustained total amputation of his thumb (nondominant - left hand) at the level of 1/3 proximal phalanx. The primary replantation procedure was performed. One artery and two dorsal veins were repaired. Three days after replantation – we noticed signs of necrosis of the replanted thumb's part. The next microsurgical procedure failed so we decided to resect the necrotic soft tissues from the replantation part of the thumb, covering the necrotic bone with the ipsilateral groin flap. The pedicle of the flap was transected 3 weeks after the procedure. The end result of this operation was elongation of the thumb after its amputation in the range of 2,5 cm. Our next plan is to perform a wrap around flap or transfer neurovascular island flap from the 3rd digit.

The second 25 - year old patient sustained total thumb amputation with a saw at the level of the ½ proximal phalanx of his nondominant left hand. During the replantation procedure one artery was reanastomosed (end to end suture), no vein for the microanastomosis was found. In the postoperative course the patient was treated with local anticoagulants (heparin swabs) and systemic heparin application without effect. The patient was qualified to the preservation of devitalized replanted bone with distant pedicle flap - contralateral abdominal flap. Six weeks after the procedure the pedicle of the flap was transected. The elongation of the reconstructed thumb was 2,0 cm in comparison to the level of the primary amputation.

The authors discuss the advantages and drawbacks of thumb reconstruction with the method of devitalized bone and pedicle flap following failed replantation procedure.

A-0483 TREATMENT DECISIONS OF CLINICIANS IN THUMB CARPOMETACARPAL OSTEOARTHRITIS: A DISCRETE CHOICE EXPERIMENT

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Introduction: Treatment goals, patient mindset, and treatment outcome expectations influence treatment outcomes in thumb carpometacarpal osteoarthritis (CMC-1 OA). However, it remains unclear if and how clinicians in hand and wrist care incorporate these factors in treatment decision-making.

Aim: We aimed to determine the extent to which patient goals, patient mindset (e.g., catastrophizing), and treatment outcome expectations influence clinicians' treatment choices for patients with CMC-1 OA. Furthermore, we aimed to compare the relative importance of these attributes between hand therapists and surgeons.

Material & Methods: We conducted a Discrete Choice Experiment using an electronic questionnaire, distributed at IFSSH 2025, through social media, and via professional organizations. Participants were presented with hypothetical cases and were asked to choose between injection, hand therapy, or surgery. We assessed four attributes: 1) treatment goal domain ("pain reduction" or "improvement in activities"), 2) level of goal ambition (i.e., the improvement the patient needs for satisfaction; "high ambition [improving from a 2 to a 9 on a 0-10 scale]" or "low ambition [improving from a 4 to a 6]"), 3) patient mindset ("positive; less catastrophizing and anxiety" or "negative; more catastrophizing and anxiety"), and 4) treatment outcome expectations ("realistic" or "unrealistic"). The influence of attributes on treatment choice was analyzed using multinomial logistic regression. Secondary analyses included comparing the results between hand therapists and surgeons, as well as calculating the relative importance of each attribute.

Results: A total of 170 clinicians (56 surgeons and 111 hand therapists) from 20 countries participated in the survey. Across all scenarios, clinicians most frequently selected hand therapy (69%), followed by injection (22%) and surgery (9%). The patient's mindset had the highest relative importance for treatment decision-making (39.3%), followed by treatment goal domain (29.4%) and treatment outcome expectations (28.6%). The level of goal ambition contributed the least (2.7%). Surgeons were more influenced by the treatment goal domain (41.2%) than hand therapists (18.1%). Furthermore, the patient mindset influenced hand therapists (48.3%) more than surgeons (27.2%). When the goal was pain, clinicians preferred hand therapy (OR = 2.09, 95% CI 1.30–3.38) or injection (OR = 2.85, 95% CI 1.70–4.78) over surgery. Hand therapy was also strongly favored for patients with a positive mindset (OR = 3.62, 95% CI 2.27–5.76) and realistic expectations (OR = 2.35, 95% CI 1.50–3.70). The level of goal ambition did not influence treatment choice ($p = 0.4$ – 0.9). **Conclusion:** Our findings suggest that clinicians mostly adhere to guideline-recommended non-surgical first approaches. The patient's mindset had the greatest influence on treatment choices, followed by the treatment goal domain and expectations. Our findings provide valuable insights for improving clinical decision-making in CMC1-OA and developing targeted decision-support tools.

A-0484 OUTCOMES OF POST-TRAUMATIC TENDON INJURIES OF THE FOREARM IN IRREPARABLE RADIAL NERVE DAMAGE ASSOCIATED WITH WAR-RELATED TRAUMA

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Introduction: Combat-related injuries differ substantially from civilian trauma due to the high-energy mechanism and frequency of extensive soft-tissue destruction. Such injuries commonly involve critical radial nerve defects accompanied by massive damage to bones and soft tissues of the upper extremity.

Purpose: To assess the effectiveness of tendon transfers in patients with irreparable combat-related radial nerve injuries combined with gunshot bone and soft-tissue damage.

Materials and Methods:: Twenty-two male patients with war-related injuries and radial nerve defects resulting in irreversible paralysis of wrist and finger extensors were evaluated.

Two groups were analyzed: Group 1 — isolated radial nerve defect; Group 2 — combined radial nerve defect with severe soft-tissue and bone injuries. Functional outcomes after tendon transfer were assessed using the Bincz et al. scoring system. Outcomes were evaluated ≥ 6 months postoperatively.

Results: • Group 1 (8 patients): excellent — 1, good — 2, fair — 5, poor — 0.

• Group 2 (14 patients): excellent — 0, good — 2, fair — 7, poor — 5.

The mean duration from injury to achievement of final functional result was 12 months (range 8–20, IQR 6) in Group 1 and 16 months (range 9–32, IQR 9) in Group 2. The prolonged course in Group 2 reflected the complexity of combined injuries requiring extensive soft-tissue reconstruction, bone grafting, and, in some cases, prolonged preoperative rehabilitation or joint-mobilizing procedures.

Conclusions: Functional outcomes after tendon transfers in combat-related radial nerve injuries are inferior to those typically reported in civilian settings. Limited options for donor tendons in severe combined trauma frequently necessitate atypical or modified tendon-transfer strategies.

A-0485 HOW HAS THE INCIDENCE OF HAND FRACTURES EVOLVED WORLDWIDE, IN HIGH-INCOME COUNTRIES AND IN THE EUROPEAN REGION, FROM 1990–2021 AND UP TO 2030?

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Introduction: Hand fractures are among the most common musculoskeletal injuries and lead to considerable functional limitations, work absenteeism and healthcare use. Worldwide, incidence rates have shown divergent trends for decades, influenced by geography, socioeconomic conditions and demographic characteristics. However, comparable long-term analyses of hand fractures across countries and age/sex groups are still lacking. Standardised data from the Global Burden of Disease 2021 study provide an opportunity to fill this gap, systematically compare trends and anticipate future care needs. Understanding these developments supports targeted prevention and efficient allocation of scarce healthcare resources. We paid particular attention to high-income countries (HICs) and the European region, with stratification by sex and age. The central research questions were:

Aim: (1) How have incidence rates of hand fractures evolved worldwide, in HICs and in the European region over recent decades?

(2) What are the projected incidence patterns up to and including 2030?

Material & Methods: Using data from the Global Burden of Disease 2021 study, we analysed temporal trends in age-standardised annual incidence rates of hand fractures per 100,000 persons for the period 1990–2021. Trends were summarised as annual percent change (APC; yearly percentage change per segment) and average annual percent change (AAPC; length-weighted mean over the entire period), with 95% confidence intervals (95%CI). Forecasting models, using time-series analyses, were applied to project trends up to 2030.

Results: Globally, the age-standardised incidence decreased over 1990–2021 (AAPC -1.08% ; 95%CI -1.11 to -1.05), more strongly in men (-1.16% ; -1.18 to -1.14) than in women (-0.83% ; -0.90 to -0.77). In HICs, the AAPC was -0.91% (-0.92 to -0.90); men -1.12% (-1.12 to -1.11) and women -0.45% (-0.47 to -0.44). In the European region, the AAPC was -1.01% (-1.02 to -0.99); men -1.19% (-1.21 to -1.18) and women -0.50% (-0.53 to -0.48). Despite the overall decline, the oldest age groups showed small annual increases worldwide: $+0.20\%$ (0.08 to 0.30) at 90–94 years and $+0.58\%$ (0.42 to 0.73) at ≥ 95 years, with steeper rises among older women. Absolute levels were highest in Europe, particularly in young adult men (e.g. 20–24 years: 1,094.7 per 100,000 in 2022). Projections indicate further, gradual declines in global and HIC incidence to 2030 (world: from 249.16 in 2022 to 237.92 in 2030 per 100,000; HICs: from 495.31 to 478.71), while sex differences persist.

Conclusions: Between 1990 and 2021, the incidence of hand fractures declined worldwide, in HICs and in Europe, but remained consistently higher in men and at higher absolute levels in Europe. Modest increases at very old age point to a growing contribution of falls and fragility mechanisms, especially among women. Projections to 2030 suggest further gradual declines. Prevention should focus on groups with the highest incidence, alongside planning for a sustained demand for care.

A-0486 TRENDS IN THE INCIDENCE OF WRIST AND FOREARM FRACTURES IN THE NETHERLANDS, 1990–2021: IMPLICATIONS FOR INJURY PREVENTION AND CARE PLANNING

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Introduction: Wrist and forearm fractures account for a substantial proportion of acute fracture care. Insight into long-term trends and causes is essential for triage, capacity planning and prevention.

Aim: (1) How have incidence rates of hand fractures evolved in the Netherlands over recent decades?

Material & Methods: Data from the Global Burden of Disease 2021 study for the Netherlands were analysed (incidence, rate per 100,000). The extracted dataset contained age-standardised estimates for both sexes combined and a breakdown by external cause. Trends were described using absolute/relative change (first→last year) and average annual percent change (AAPC; log-linear).

Results: The age-standardised incidence decreased from 468.0 per 100,000 in 1990 to 434.7 in 2021 (-7.1% overall; AAPC -0.09% per year). In 2021, the leading external causes were other exposure to mechanical forces (198.0 per 100,000) and falls (185.3), followed by physical violence (other means) (10.6) and cyclist road-traffic injuries (9.1). Clear sex- and age-related differences in incidence were observed, along with an increase over the most recent decades in nearly all age groups.

Conclusions: The incidence of wrist and forearm fractures is stable to slightly decreasing, but the demand for care remains substantial, with a rise in recent decades. Fall prevention, safer work and sports environments and improved traffic safety, complemented by streamlined care pathways and regular monitoring, may help reduce incidence. This approach can lessen the fracture burden and support more efficient use of available capacity.

A-0487 DECOMPRESSION AT THE SOLE SITE OF POSITIVE TINEL'S SIGN IN SURGERY FOR ULNAR NERVE ENTRAPMENT AT THE ELBOW

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Introduction: The ulnar nerve can be entrapped at various points in the elbow region. Ulnar nerve entrapment at the elbow (UNE) is diagnosed through clinical examination, including provocative tests like Tinel's sign and elbow flexion tests, and electrodiagnostic tests. Tinel's sign, elicited by tapping over the nerve, is classic but not perfectly sensitive or specific. Often, decompression is performed along the entire course of the nerve at the elbow, regardless of the primary site of entrapment, and this may expose the nerve to unnecessary trauma. Tinel's sign demonstrates relatively modest sensitivity when used as a diagnostic test. Still, we hypothesized that, combined with other clinical findings for diagnosis, such as positive elbow flexion test and characteristic sensory changes in the ring and little fingers, as well as motor changes in more severe cases, Tinel's sign can help surgeons localize the compression site and plan surgery accordingly. **Aim:** To prospectively assess clinical and patient-reported outcomes after simple targeted decompression of the ulnar nerve solely at the site of a positive Tinel's sign in patients with UNE.

Material & Methods: This study included 35 patients (17 women, 18 men; mean age, 49 ± 16 years) who underwent surgery for UNE at Linköping University Hospital, Sweden, between 2020–2024. All had simple decompression at the site of positive Tinel's sign, identified during preoperative clinical examination. Patients with ulnar nerve subluxation were excluded. Assessments included neurography, symptom grading, grip and pinch strength, sensory testing, and the Swedish Patient-Rated Ulnar Nerve Evaluation (PRUNE-S) questionnaire. Follow-up occurred at 6 weeks, 3 months, and 12 months. PRUNE-S scores were compared over time using Friedman's and Wilcoxon's tests. Perceived outcomes were reported as "worsened," "unchanged," "improved," or "completely recovered."

Results: All patients had a positive Tinel's sign preoperatively, with most ($n = 27$) located at Osborne's ligament. The median PRUNE-S score improved from 51 [IQR 33–58] preoperatively to 22 [9–48] at 3 months and 13 [4–32] at 12 months ($p < 0.001$). Significant improvements were seen across all PRUNE-S subscales (pain, sensory, specific activities, and usual activities) at both 3 and 12 months (all $p < 0.001$). At 3 and 12 months postoperatively, 31 of 35 patients (89%) reported improved or completely recovered outcomes, with no significant difference across preoperative symptom severity of UNE. No surgical complications occurred at 3 months, and one patient had developed complex regional pain syndrome by 12 months.

Conclusions: Simple decompression limited to the sole site of positive Tinel's sign may provide good surgical outcomes with significant improvements in symptoms and function. The method was effective and associated with minimal complications. When combined with other findings, such as positive elbow flexion tests, motor weakness, and characteristic sensory loss for diagnosis, Tinel's sign appears to be a reliable clinical guide for localizing the compression site, potentially reducing the need for extensive decompression or preoperative electrodiagnostic testing. Targeted decompression may thus represent an efficient, less invasive surgical strategy for treating UNE.

A-0488 THE TRIGGERHAPPY TRIAL: A COMPARISON OF DAY-TO-DAY PROMS BETWEEN OPEN RELEASE AND CORTICOSTEROID INJECTION FOR TRIGGER DIGIT

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Introduction: Corticosteroid injections and open release of the A1 pulley are well-established treatments for trigger digit, but the recovery period has not been studied in detail.

Aim: This study compared day-to-day patient-reported pain, stiffness and triggering until complete resolution of symptoms between two cohorts of patients, treated either by open release or by corticosteroid injection.

Material & Methods: This is a prospective observational study on two cohorts of patients who underwent treatment for trigger digit between September 2020 and February 2024. 106 patients surgically treated by open release and 107 patients treated by corticosteroid injections were included. Prior to treatment, the patients completed the Quick-DASH and HQ-8 questionnaires along with self-assessment of pain, stiffness and frequency of triggering using VAS-scales. After treatment, the patients registered VAS-score for these symptoms day-by-day on a form until complete recovery, at which they completed the Quick-DASH and HQ-8 and mailed them along with records of the daily assessments.

Results: A total of 195 patients, 96 patients in the surgical cohort and 99 in the corticosteroid cohort (91% and 93%, respectively), sent in complete records at six weeks. Triggering resolved instantly in the open release cohort, and at a median of 20 days in the corticosteroid group. There were no significant differences regarding pain and stiffness between the two cohorts at any time during the follow-up. The mean number of days to complete pain relief was 11 in both groups, and patients reported complete resolution of stiffness at a median of 12 days in the open release group and 15 days in the corticosteroid group. Quick-DASH decreased significantly from baseline to last records in both cohorts: from 34 to 11 in the open release group and from 37 to 5 in the corticosteroid group.

Conclusions: This study could not detect any significant difference in patient-reported post-procedural pain and stiffness between open release and corticosteroid injection for trigger digit. The immediate resolution of triggering after open release suggests a potential clinical advantage and supports considering it as a first-line treatment option.

A-0489 PREPARING PATIENTS FOR SHARED DECISION-MAKING: CO-CREATION OF A DECISION AID FOR POST-OPERATIVE REHABILITATION AFTER DISTAL RADIUS FRACTURES

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Introduction: Shared decision-making (SDM) is increasingly recognized as a cornerstone of patient-centered practice. After surgery for a distal radius fracture, regaining balance in hand function requires identifying the most appropriate post-operative rehabilitation option—whether supervised or home-based. However, decisions about rehabilitation are typically made by clinicians, with patients rarely involved beyond receiving information. Many patients are unaware that a decision is being made and lack accessible, comprehensible information about the available rehabilitation options, which can be addressed through a patient decision aid—an evidence-based tool that helps patients understand their options, clarify their values and preferences, and thereby enabling meaningful engagement in SDM.

Aim: To co-create a decision aid with patients and clinicians to facilitate SDM regarding post-operative rehabilitation options after distal radius fractures.

Material & Methods: The concept of balance—across the involvement of patients and clinicians in the development process, the involvement of patients in the decision-making process, and the goal of facilitating balance in hand function—was central to the development of the decision aid. The decision aid was developed based on international frameworks, available evidence and insights from focus group interviews with patients operated for distal radius fractures on their decisional needs for SDM. A user-centered approach was applied to ensure that the decision aid would be relevant and applicable for both patients and clinicians for future SDM processes. Six patients and nine clinicians participated in a steering group that were involved in three iterative development phases: (1) an online prototype was co-created in workshops; (2) readability and color accessibility were optimized, and an online mock-up was published on the hospital website for review by the steering group; and (3) usability was tested with patients (n = 14) and clinical applicability with clinicians (n = 9), followed by final steering group review.

Results: The decision aid “My Rehabilitation Pathway” was developed to prepare patients for participation in SDM about rehabilitation decisions made within hospital and municipal settings during the first six weeks postoperatively. “My Rehabilitation Pathway” consists of four sections: an introduction, rehabilitation options, guidance for reflection, and expectations for the rehabilitation trajectory. Patients found the decision aid easy to understand, comprehensive, and useful, and they would recommend it to others. Clinicians saw potential for the decision aid to support patients’ preparation for SDM in clinical consultations.

Conclusions: The co-creation process resulted in a targeted, evidence-based decision aid providing information that prepares patients to engage in dialogue and partnership with clinicians about post-operative rehabilitation options. “My Rehabilitation Pathway” shows promise for enhancing SDM in clinical practice, thereby promoting person-centered decisions about rehabilitation options aimed at achieving an optimal balance in hand function after distal radius fracture surgery.

A-0490 BONE-ANCHORED PROSTHESES THROUGH OSSEOINTEGRATION APPLIED IN THE UPPER EXTREMITIES; A SYSTEMATIC REVIEW, BIBLIOMETRIC ANALYSIS AND EXPERTS’ OPINIONS ON THE IMPLANT SYSTEMS USED, INDICATIONS AND PATIENT ELIGIBILITY, SURGICAL AND REHABILITATION PROCEDURE, P

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Introduction: Osseointegrated, bone-anchored prostheses for the upper extremities have emerged as an alternative to socket-suspended prostheses, aiming to improve prosthetic control, comfort, and embodiment. However, clinical practice is characterized by variation in implant systems, indications, perioperative pathways, and outcome reporting as this a new emerging discipline

Aim: To systematically review the literature, map the scientific landscape, and integrate experts’ opinions regarding upper-extremity osseointegration with a focus on implant systems used, indications and patient eligibility, surgical and rehabilitation procedures, postoperative outcomes, and complications.

Material & Methods: A systematic review of clinical studies on upper-extremity bone-anchored prostheses was conducted

in major medical databases according to PRISMA principles. Bibliometric analysis was performed to characterize publication trends, key contributing authors, institutions, and countries, and to identify thematic clusters. In parallel, experts involved in upper-extremity osseointegration programs worldwide were invited to add on current practice and perceived best standards regarding indications, implant selection, surgical techniques, rehabilitation protocols, and outcome measures. Results: The literature demonstrates a steady increase in publications, dominated by observational cohort studies from a limited number of high-volume centers. Multiple implant systems are in use, with differences in design, staging of surgery, and rehabilitation timelines. Indications generally include adults with transhumeral or transradial amputation who experience socket-related problems and meet defined medical and psychosocial criteria. Across studies and expert reports, patients commonly show improved prosthetic use, functional performance, and satisfaction. The most frequently reported complications include superficial and deep infections and soft-tissue problems at the skin–implant interface, while mechanical failures and periprosthetic fractures are less common but clinically significant. Considerable heterogeneity exists in outcome measures and follow-up duration.

Conclusions: Upper-extremity bone-anchored prostheses through osseointegration appear to offer meaningful functional and patient-reported benefits for carefully selected candidates, at the cost of procedure-specific complications that require surveillance. The combined evidence and expert opinions highlight the need for standardized indications, harmonized surgical and rehabilitation protocols, and consensus on core outcome sets and complication reporting, as well as collaborative efforts to generate robust long-term data.

A-0491 TWO-YEAR CLINICAL AND RADIOLOGIC OUTCOMES OF DORSORADIAL LIGAMENT RECONSTRUCTION USING THE ABDUCTOR POLLICIS LONGUS TENDON FOR TRAPEZIOMETACARPAL JOINT INSTABILITY

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Introduction: In thumb trapeziometacarpal (TM) instability, laxity of the surrounding ligaments leads to pain and weakness in grip and pinch strength, which predisposes patients to developing TM joint arthritis. Surgical reconstruction of the dorsoradial ligament (DRL), a primary stabilizer of the joint, has been proposed as a method to restore joint stability and prevent degenerative progression.

Aim: This study aims to evaluate the clinical outcomes of a newly devised dorsoradial ligament (DRL) reconstruction technique using the abductor pollicis longus (APL) tendon in patients with symptomatic TM joint instability.

Material & Methods: Between January 2012 and January 2023, 23 cases of DRL reconstruction using the APL tendon were performed in patients diagnosed with Eaton stage I trapeziometacarpal arthritis with instability. Pain and functional scores, including VAS, grip strength, tip/tripod/key pinch, and DASH score, were evaluated preoperatively and postoperatively.

Results: A total of 18 cases were included in the final analysis. Five cases were excluded due to follow-up loss (n=1), revision surgery before the 2-year follow-up (n=1), progression requiring arthrodesis before the 2-year follow-up (n=1), synovectomy for rheumatoid arthritis (n=1), and traumatic TM joint instability (n=1). At the 2-year follow-up, clinical outcomes showed statistically significant improvement compared to preoperative assessments: VAS pain score (6.3 ± 2.2 vs 1.2 ± 1.3 , $p < 0.001$), grip strength (44.4 ± 23.5 lbs vs 53.8 ± 19.6 lbs, $p < 0.001$), tip pinch (3.9 ± 1.8 vs 6.2 ± 1.9 , $p < 0.001$), tripod pinch (6.2 ± 2.6 vs 9.6 ± 3.3 , $p < 0.001$), key pinch (8.3 ± 4.3 vs 11.9 ± 5.0 , $p < 0.001$), and DASH score (44.9 ± 18.4 vs 19.2 ± 13.4 , $p < 0.001$). Postoperative radiographs demonstrated improved TM joint alignment in all cases, and no arthritic changes were observed at the 2-year follow-up.

Conclusions: Dorsoradial ligament reconstruction using the APL tendon is a safe and effective surgical option for treating TM joint instability. The technique led to significant improvement in clinical outcomes, and no arthritic changes were observed at the 2-year follow-up.

A-0492 ANATOMICAL VALIDATION OF A RETROGRADE ULTRASOUND-GUIDED TECHNIQUE FOR A1 PULLEY RELEASE IN THE THUMB

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Introduction: Percutaneous ultrasound-guided release of the A1 pulley in the thumb is increasingly adopted as a minimally invasive alternative to open surgery. Despite its advantages, concerns persist regarding the ability to achieve a complete release and the potential risk of injury to the digital neurovascular bundle and flexor tendon.

Aim: To assess the safety and completeness of ultrasound-guided A1 pulley release in the thumb.

Material & Methods: Twelve thumbs from Thiel-embalmed cadavers underwent ultrasound-guided A1 pulley release using a percutaneous retrograde approach with the Kemis scalpel. After the procedure, each specimen was dissected. Main variables included completeness of A1 pulley release, percentage of A1 opening, and presence of neurovascular or tendon injury (classified as no lesion, abrasion, partial tear, or complete tear). Secondary variables included A1 pulley, annular pulley (Av), and oblique pulley (Ao) lengths, pulley configuration according to Schubert, distance between the proximal A1 border and the crossing of the radial digital nerve, and total pulley venting length. Numerical data are presented as median and range, and categorical data as percentages.

Results: A complete release of the A1 pulley was achieved in 91.7% of specimens. One specimen showed a partial release, with 59.9% of the A1 pulley length opened. No neurovascular injuries were identified. Tendon injury occurred in 40% of thumbs, consisting exclusively of minor lesions: 62.5% abrasions and 37.5% partial-thickness tears, with no complete ruptures. The median A1 pulley length was 4.86 mm (range 3.40–7.07mm). The median Av pulley length was 6.31 mm (range 3.84–14.84mm), and the Ao pulley length measured 11.33 mm (range 6.40–18.60mm). Total pulley venting length reached a median of 11.96 mm (range 7.56–18.60mm). Pulley configuration according to Schubert showed anatomical variability, with type II in 44% of cases, type III in 33%, and type IV in 22%.

Conclusions: Ultrasound-guided percutaneous release of the A1 pulley in the thumb proved feasible and safe in this cadaveric study. The high rate of complete release, absence of neurovascular injury, and consistent safety margin relative to the radial digital nerve support the use of ultrasound guidance for this procedure. Although tendon abrasions and partial-thickness lesions occurred in a minority of specimens, no major complications were observed.

A-0493 RELIABILITY AND VALIDITY OF THE TURKISH VERSION OF THE STROKE UPPER EXTREMITY CAPACITY SCALE (SULCS) IN POST-STROKE PATIENTS

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Introduction: Aim: The Stroke Upper Limb Capacity Scale (SULCS) is a performance-based tool designed to assess upper limb functional capacity, encompassing both basic and advanced movements. This study aimed to evaluate the psychometric properties of the Turkish version of SULCS in post-stroke patients.

Material & Methods: This was a cross-sectional study. Fifty-six patients with upper limb hemiparesis. The Turkish SULCS was administered twice by the same researcher, with a one-week interval. Convergent validity was assessed using the Fugl-Meyer and ABILHAND scales.

Results: The Turkish SULCS demonstrated excellent intra-rater reliability, with an intraclass correlation coefficient (ICC) of 0.97 (95% CI: 0.95–0.98). The standard error of measurement (SEM) was 0.61 (SEM% = 9.76), and the minimum detectable change (MDC) was 1.69. Strong correlations were observed between the Turkish SULCS and the Fugl-Meyer ($r = 0.77$) and ABILHAND ($r = 0.86$) scales, confirming excellent convergent validity.

Conclusions: The Turkish version of SULCS exhibits strong intra-rater reliability and excellent convergent validity, supporting its applicability in clinical settings for assessing upper limb function in post-stroke patients.

A-0494 EFFICACY AND SAFETY OF ELECTIVE PRIMARY TOTAL ELBOW ARTHROPLASTY IN THE LAST 25 YEARS: A SYSTEMATIC REVIEW

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Introduction: Despite the good efficacy of total elbow arthroplasty (TEA) in relieving pain and improving function, its survivorship remains low compared to other large joint replacements

Aim: This systematic review aimed to evaluate the efficacy and safety of modern elective primary total elbow arthroplasty (TEA).

Material & Methods: A comprehensive literature search identified studies reporting functional and safety outcomes of primary elective TEA in ≥ 10 cases in the last 25 years. Studies reporting data on acute TEA for trauma and revision TEA were excluded. Primary outcomes included function, pain, and range of movement (ROM). Secondary outcomes were revision, reoperation rates and other complications. Revision and all efficacy outcomes were pooled separately for short-, mid- and long-term follow-up, which were based on mean follow-up of included studies.

Results: A total of 74 studies were included with a total of 3645 TEAs (mean age 58 years). The main indication was rheumatoid arthritis (RA).

Meaningful improvements were observed in all efficacy outcomes (weighted means): at long-term follow-up (>7 years of mean follow-up), pain visual analogue scale (VAS) was 1.9 points, Mayo Elbow Performance Score (MEPS) was 82 points, disabilities of the arm, shoulder and hand (DASH) scale was 43 points and total flexion-extension and pronation-supination

arcs were 106 and 137 degrees, respectively. Weighted mean long-term survivorship (at least 7 years of mean follow-up; revision as end-point) was 86.3%; weighted mean deep infection was 3.2%, all-cause reoperation 16.8%, periprosthetic fracture (intra- and/or postoperative) 6.8%, persistent ulnar nerve paraesthesia/dysaesthesia 5.8% and dislocation of unlinked implants 5%. Subgroup analyses of RA/inflammatory arthritis patients only found similar efficacy and safety outcomes to the overall population. All outcomes were very similar between unlinked and semi-constrained prostheses except for a slightly higher reoperation rate in favour of the semi-constrained group (weighted mean 18.6% vs 15%). Conclusions: Despite its favourable efficacy profile, TEA is associated with high revision and reoperation rates which remain static over the past decades. A complete re-evaluation of current design principles and materials may be required.

A-0496 MANAGEMENT OF CARPAL TUNNEL SYNDROME: A NETWORK META-ANALYSIS

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Introduction: Carpal tunnel syndrome (CTS) is a common neuropathy with multiple available treatment options, ranging from conservative management to surgical intervention.

Aim: This study aimed to assess and compare the effectiveness of all available interventions for CTS.

Material & Methods: This network meta-analysis was conducted as part of an umbrella review. Systematic reviews of randomized controlled trials (RCTs) evaluating any intervention for CTS were identified through EMBASE and Medline (via Ovid) from inception to October 2024. Eligible RCTs reported outcomes using the Boston Carpal Tunnel Questionnaire (BCTQ). The Cochrane Risk of Bias tool (ROB2) and the GRADE framework were used to assess study quality and certainty of evidence. Network meta-analyses were performed separately for the two BCTQ subscales—Symptom Severity Scale (SSS) and Functional Severity Scale (FSS)—at short-term (≤ 12 weeks) and mid-term (20–28 weeks) follow-up. Subgroup analyses were conducted based on CTS electrophysiological severity. Treatment rankings were generated using surface under the cumulative ranking curve (SUCRA) values.

Results: A total of 92 RCTs derived from 43 systematic reviews were included. Most interventions showed superiority over placebo or no treatment. At short-term follow-up, among 15 interventions, endoscopic surgery ranked highest for SSS, while corticosteroid injection combined with splinting ranked highest for FSS in CTS of all severities. In mild-to-moderate CTS, platelet-rich plasma (PRP) injection ranked first. At mid-term follow-up, extracorporeal shockwave therapy ranked first for both SSS and FSS in CTS of all severities (8 interventions) and in mild-to-moderate CTS (7 interventions). Most findings were supported by low-certainty evidence. Complications were rare and typically minor.

Conclusions: Except in cases of severe CTS, non-surgical interventions should be offered to patients before surgical release. These findings support a stepwise approach to CTS management, emphasizing conservative options in the early stages of the disease.

A-0497 OUTCOMES IN PATIENTS UNDERGONE TREATMENT FOR RADIOCARPAL FRACTURE DISLOCATIONS AT OSLO UNIVERSITY HOSPITAL, 2020-2024

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Introduction: Radiocarpal dislocation or - fracture dislocation is a rare injury and usually due to high energy trauma. Identification and recognizing the scope of these injuries can be challenging. Overlooking these injuries causing delayed treatment is associated with a poor outcome. Injury patterns, treatment options and clinical outcomes are sparsely described in the literature.

Aim: This study aimed to assess patients treated for radiocarpal dislocation at Oslo University Hospital, a level 1 trauma center, during the last five years.

Material & Methods: Eligible patients were identified using the electronic medical record system, in the period January 2020 to December 2024. Patient's charts were reviewed to collect demographic data, injury related data, associated injuries as well as surgical technique, course of treatment and possible complications. We reviewed X-rays for all patients. Patients' outcomes were assessed in a follow-up including clinical examination and patient-reported outcome measures (PRWHE and Q-DASH). X-rays at follow-up were evaluated to assess alignment and possible sequelae. A literature review was conducted by a search in PubMed.

Results: Six patients undergone surgical treatment for radiocarpal dislocation were identified. One patient was a foreigner and was not available for further follow-up. All five patients invited to follow-up consented to participate. Median observation time was 20months (range, 15-63 months). There were four men and one woman, and median age was 44 years (range, 18-54 years). The dislocation in all patients was a result of high energy trauma, and they were all Dumontier type 2 fracture dislocations with a dorsal displacement. At hospital admittance, all fracture-dislocations underwent closed reduction and maintained in a cast until surgery. Definitive surgery consisted of open reduction and internal fixation, in some cases arthroscopic assisted, and all underwent suture or reattachment of the volar extrinsic ligaments. All patients were immobilized in a cast 6-8 weeks postoperatively before they started range of motion rehabilitation. Median active range of motion at time of follow-up was for extension 55degrees (range, 40-60degrees), flexion 65degrees (30-75), supination 75degrees (70-90), pronation 85degrees (80-90), radial deviation 20degrees (10-25) and ulnar deviation 35degrees (30-50). Median grip strength was 43kg (32-60kg). Median Q-DASH and PRWHE scores were respectively 4,5 (range, 0-13,6) and 10,5 (0-12). At follow-up, patients reported VAS for pain at rest was median 0 (range, 0-1) and NRS for satisfaction with wrist function was 8 (8-9). Regarding complications, one patient needed oral antibiotics for a superficial K-wire related infection. K-wires were removed in a planned surgery later. Two patients needed secondary surgery with plate removal. At time of follow-up X-rays demonstrated low grade osteoarthritis in all patients, however we did not detect any convincing signs of ulnar translation in any of the patients.

Conclusions: This study demonstrated good short term clinical outcomes in patients undergone treatment for radiocarpal fracture dislocation. Our findings are comparable to currently available literature and emphasizes the importance of early detection and surgical management.

A-0498 ARTHROSCOPIC VERSUS OPEN REPAIR OF TRIANGULAR FIBROCARILAGE COMPLEX TEARS: A RETROSPECTIVE COMPARATIVE STUDY

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Introduction: The management of triangular fibrocartilage complex (TFCC) tears remains debated, particularly regarding whether open or arthroscopic repair provides superior outcomes. These injuries can significantly affect wrist function and stability, and the choice of surgical technique is often influenced by surgeon experience and perceived advantages of each approach.

Aim: The aim of this study was to compare clinical, functional, and stability outcomes between arthroscopic and open TFCC repairs performed at a single institution over a 12-year period.

Material & Methods: We retrospectively reviewed 38 consecutive patients who underwent surgical TFCC repair between 2010 and 2022, with a minimum follow-up of two years. Twenty-six patients (68%) were treated arthroscopically and twelve (32%) through an open approach. The choice of technique depended on surgeon preference and not on tear type. Mean age was 34.6 ± 10.8 years in the arthroscopic group and 39.2 ± 12.1 years in the open group ($p = 0.18$). Mean follow-up was 38.4 months (range, 24–58). Lesions were mostly of traumatic origin (92%), predominantly peripheral ulnar-sided tears, while degenerative central perforations accounted for 8% of cases.

Results: Mean operative time was shorter for arthroscopic repair (64 ± 14 min) compared with open repair (78 ± 18 min, $p = 0.03$). At final follow-up, mean VAS pain scores were significantly lower in the arthroscopic group (1.4 ± 1.2 vs. 2.1 ± 1.5 , $p = 0.04$), whereas DASH (11.6 ± 9.3 vs. 15.2 ± 10.8 , $p = 0.18$) and PRWE (12.8 ± 11.1 vs. 18.5 ± 12.4 , $p = 0.09$) showed no significant differences. Grip strength recovery (93.2% vs. 90.4% of the contralateral side, $p = 0.29$) and DRUJ stability (96% vs. 92%, $p = 0.62$) were comparable between groups. Complications occurred in 6 of 26 arthroscopic cases (23%) and 4 of 12 open cases (33%) ($p = 0.49$), most commonly transient pain, mild stiffness, or superficial wound irritation. Two patients (5%) required reoperation, one per group ($p = 0.58$). No infections or recurrent instability were observed.

Conclusions: Both arthroscopic and open TFCC repairs provided reliable restoration of function and DRUJ stability with low complication and reoperation rates. Arthroscopic repair was associated with shorter operative time and lower postoperative pain but otherwise similar mid-term outcomes. Technique selection may therefore be guided by surgeon experience and intraoperative preference rather than clear functional superiority.

A-0499 SURGICAL MANAGEMENT OF SYMPTOMATIC OS ACROMIALE: A RETROSPECTIVE CASE SERIES

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Introduction: Os acromiale is an unfused secondary ossification center of the acromion that may cause shoulder pain, impingement, and functional impairment. Although often asymptomatic, persistent cases resistant to conservative treatment may require surgical management. Various operative techniques have been described, including fragment excision, internal fixation, and acromioplasty. Arthroscopic subacromial decompression offers a minimally invasive

alternative that preserves the deltoid origin and avoids hardware-related complications.

Aim: The aim of this study was to assess the clinical and functional outcomes of arthroscopic subacromial decompression in patients with symptomatic os acromiale, with or without associated rotator cuff tears.

Material & Methods: This retrospective study included nine patients (six men, three women; mean age 37.9 years, range 24–52) who underwent arthroscopic subacromial decompression for symptomatic os acromiale between 2003 and 2023. Diagnosis was confirmed with MRI and selective injection of local anesthetic at the nonunion site. Six cases were classified as meso-type and three as pre-type os acromiale. The mean follow-up period was 31.2 months (range 18–64). The procedure involved arthroscopic removal of inflammatory tissue, subacromial bursectomy, and acromioplasty with excision of the main accessory ossicle, while preserving the integrity of the deltoid attachment. Functional outcomes were assessed using the Oxford Shoulder Score (OSS) and visual analog scale (VAS) for pain.

Results: All patients experienced marked improvement in shoulder function and pain. Mean VAS decreased from 6.1 preoperatively to 1.8 at final follow-up, and mean OSS improved from 24.5 to 42.7. Range of motion was fully restored in eight patients and near full in one. All patients returned to unrestricted daily and occupational activities within three months. No cases of infection, deltoid weakness, recurrence, or need for revision surgery were reported. Younger patients (<40 years) achieved significantly superior functional outcomes ($p = 0.04$), while smokers exhibited higher residual discomfort ($p = 0.03$). The presence of a concomitant rotator cuff tear did not negatively influence results.

Conclusions: Arthroscopic subacromial decompression is a safe, reliable, and effective surgical option for the treatment of symptomatic os acromiale, providing significant pain relief, excellent functional recovery, and minimal risk of complications.

A-0500 HAND THERAPY IN RADIAL NERVE INJURY: A COMPLEX CASE-STUDY FROM SURGERY TO WORK REINTEGRATION

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Introduction: Radial nerve injuries, frequently associated with fractures of the humerus and radius, pose a clinical challenge due to their impact on strength, sensation, and dexterity of the upper limb, and can even lead to complications such as complex regional pain syndrome. Nerve regeneration is a slow process, occurring on average at a rate of about 1 mm per day, making early and specialized intervention in Hand Therapy essential to optimize functional outcomes.

Aim: To comprehensively analyze a complex rehabilitation process in Hand Therapy of an individual with radial nerve injury associated with upper limb fracture, from the first postoperative day to full return to work.

Material & Methods: To evaluate the variables under study, the following assessment instruments were used: Hand and pinch dynamometry, The QuickDASH, Vancouver Scale, Semmes-Weinstein Monofilaments, Goniometry, and the Nine Hole Peg Test. The variables hand grip and pinch strength, joint and range of motion, manual dexterity, and scarring process were evaluated biweekly. Sensitivity and functionality of the upper limb were assessed monthly. After one and a half months of discharge and return to work, a follow-up assessment of the results obtained was carried out.

Results: The variables under study showed improvements throughout the 11 weeks of hand therapy intervention. The follow-up assessment showed improvements in hand grip and pinch strength, manual dexterity, upper limb functionality, and sensitivity. The scarring process variable maintained the values from Assessment 4 in the follow-up assessment.

Conclusions: Hand therapy, when initiated early, appears to promote a facilitate a quicker and more successful return to work in patients with complex radial nerve injuries. This case highlights the important role of early intervention in the

rehabilitation process, where ongoing therapeutic assistance from the first postoperative day to laboral reintegration, proved essential for preserving joint mobility, prevent deformities, and a functional recovery.

A-0501 APPLICATIONS OF THREE-DIMENSIONAL TECHNOLOGIES IN HAND SURGERY

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Introduction: Three-dimensional (3D) visualization, 3D printing and Mixed-Reality have become essential innovative tools in modern medicine, providing new abilities for diagnostics, preoperative planning, and medical education. In hand surgery, where anatomical complexity and precision are crucial, these technologies enable highly detailed visualization of osseous, vascular, and soft-tissue structures. By converting computed tomography (CT) and magnetic resonance imaging (MRI) data into tangible models, 3D technologies allow accurate representation of patient-specific anatomy and pathology. **Aim:** The purpose of this study was to present the clinical and educational applications of three-dimensional visualization, 3D printing and Mixed Reality in hand surgery, emphasizing their role in improving surgical planning, intraoperative safety, and communication with patients to support optimal and balanced functional outcomes.

Material & Methods: The study includes cases from our Department, where 3D visualization and printed anatomical models were applied for diagnostic assessment and preoperative planning. Mixed reality obtained through the use of specialized goggles enabled intraoperative control, by displaying virtual holograms of the patient-specific reconstructions aligned to the patient's body in the operating room. Working with this equipment is possible in a fully sterile environment. Navigation is performed through hand gestures and eye-directed control, eliminating the risk of contamination. Patient-specific 3D models were generated from CT or MRI datasets using dedicated segmentation software. Clinical indications included vascular malformations, bone deformities, tumors, nerve injuries and post-traumatic defects of the upper limb. Additionally, 3D models were used as educational and communication tools for patients, medical students and residents, providing 1:1 anatomical reference and hands-on learning experience.

Results: Implementation of 3D technology significantly facilitated surgical access planning and improved lesion localization, particularly in cases involving non-palpable or deeply situated lesions. Mixed-reality allowed precise mapping of vascular and neural structures, enhancing intraoperative safety and enabling aimed surgical approaches. The use of patient-specific 3D models contributed to minimize the risk of complications. In the educational context, 3D visualization and modeling enhanced anatomical understanding of the biomechanical principles underlying balanced hand function, and engagement among trainees. Furthermore, presenting 3D models during consultations improved patient comprehension of their condition and supported the informed consent process.

Conclusions: Three-dimensional visualization and 3D printing technologies represent valuable tools in modern hand surgery. They enhance preoperative planning, optimize surgical precision, and improve communication between surgeons, patients, and trainees. Their integration into clinical and educational practice provides benefits for treatment safety, supporting precise, function-oriented surgical decision-making. With ongoing technological development, 3D applications are expected to become a standard component of comprehensive surgical care.

What's innovative in our work:

The presentation includes interactive three-dimensional reconstructions accessed through QR codes, which can be scanned and viewed on smartphones or other devices during the presentation. This approach allows us to clearly demonstrate to patients the mechanisms of their injuries, the precise localization of tumors, and the rationale behind the chosen treatment method.

A-0502 ARTIFICIAL INTELLIGENCE—ASSISTED DETECTION OF PERILUNATE WRIST INJURIES

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Introduction: Perilunate wrist injuries are uncommon but serious conditions that remain frequently underdiagnosed in emergency settings. Early recognition is essential to allow timely treatment and prevent chronic instability and long-term dysfunction

Aim: To compare diagnostic timing, case detection, and treatment approaches between two regional hospitals, one of which has implemented an artificial intelligence (AI) radiographic support system (Gleamer BoneView), to evaluate whether AI improves early diagnosis.

Material & Methods: A retrospective review was conducted of perilunate injuries diagnosed in two centers within the same healthcare area between 2024–2025. Hospital A (Hospital Figueres) relies on standard radiographic interpretation, whereas Hospital B (Hospital Palamós) incorporates the AI-assisted system Gleamer BoneView in its emergency department workflow. Demographic data, time to diagnosis, and surgical treatment were collected.

Results: Hospital A identified four cases, all male, with a mean age of 39 years (range 19–76). All were diagnosed late, with a mean delay of 96 days (range 14–270). Three patients underwent proximal row carpectomy due to chronic presentation, while one patient was treated with open reduction and Kirschner wire fixation (14 days from lesion)

Hospital B identified two cases, both male, with a mean age of 36 years, diagnosed acutely with an average delay of 1 day. One patient underwent closed reduction followed by percutaneous screw fixation and Kirschner wires, while the second was treated with closed reduction and Kirschner wire fixation alone.

Conclusions: Perilunate injuries continue to be frequently missed in the acute setting.

In this preliminary comparison, the center using AI-assisted radiographic interpretation demonstrated substantially earlier diagnosis of perilunate injuries, enabling more conservative and joint-preserving treatments. While sample size is limited, these findings suggest that AI tools may help reduce diagnostic delays in complex wrist injuries and positively influence treatment pathways. Prospective studies are warranted to confirm these observations.

A-0503 MANAGEMENT AND OUTCOMES OF QUADRIGA PHENOMENON

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Introduction: Quadriga phenomenon is a hand pathology first described by Claude Verdan and is characterised by the lack of flexion of the fingers due to a pathology in a single flexor digitorum profundus (FDP), due to the conjoined nature of the tendons. Though they are well described in literature there is little written about the clinical management and outcome of these cases.

Material & Methods: We present a series of four cases of quadriga phenomenon over the past three years from a tertiary hand unit.

Results: Of the four cases, two patients had an overtight FDP repair resulting in slackening of the other flexor tendons sparing the index finger. One of these required surgical release of the tight tendon, and budding of the tendons to the index finger. The other patient required a two stage flexor tendon reconstruction and budding of the tendons. Two patients had quadriga from adhesions following flexor tendon repair. One of them had a flexor tenolysis with full restoration of function. The other patient had joint stiffness and had a steroid injection and MUA to improve his passive movements.

However, he declined further surgery. We present pictures and videos of pre-operative and post-operative outcomes. Conclusion: Though it is a small series, given the rarity of this condition and lack of information in the literature about the surgical management of this condition, we provide treatment options for these patients, present outcomes and highlight some of the challenges in management. The presentation also describes the history of the eponym and a suggested change from *quadrige* to *triga* as the pathology does not affect the index finger due to its separate muscle belly.

A-0504 THE ROLE OF SCALENE MUSCLE INJECTIONS IN IDENTIFYING AND TREATING THORACIC OUTLET SYNDROME

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Introduction: Thoracic outlet syndrome (TOS) is complex pathology of compression of neurovascular structures between scalene muscle and in costoclavicular space. The most common subtype is neurogenic TOS, where the true (classic) form accounts for only ~1%, while the disputed/common form represents 95–99%, making diagnosis and management particularly challenging.

Aim: To evaluate the diagnostic and therapeutic efficacy of scalene muscle injection with triamcinolone in patients with primary neurogenic thoracic outlet syndrome (nTOS) and to determine whether clinical improvement following the injection predicts favorable surgical outcomes.

Material & Methods: A total of 91 ultrasound-guided scalene muscle injections were performed in patients with suspected neurogenic thoracic outlet syndrome between 2014 and 2022. Each injection consisted of triamcinolone 40 mg mixed with 9.0 mL of 1% lidocaine. Follow-up data were available for 86 patients (74% female, 26% male). Clinical response was assessed using changes in VAS scores.

Results: Improvement in VAS scores after scalene muscle injection was observed in 66% of patients, while 34% showed no improvement. Of the entire cohort, 15% proceeded to surgical treatment and 85% continued with conservative management.

Among patients who experienced pain relief after the injection, 19% ultimately underwent surgery, and 91% of them achieved a good postoperative outcome. In contrast, only 7% of patients without VAS improvement proceeded to surgery, and this group demonstrated a poor outcome.

Conclusions: Scalene muscle injections with triamcinolone demonstrate both diagnostic and therapeutic value in patients with primary neurogenic thoracic outlet syndrome. A positive clinical response reliably predicts favorable surgical outcomes, underscoring their usefulness as a diagnostic tool, particularly in cases of disputed nTOS. Furthermore, repeated injections offer therapeutic benefit for patients experiencing recurrent symptoms, supporting their role as an effective component of ongoing management.

A-0505 EARLY MOBILIZATION AFTER DUAL-MOBILITY TRAPEZIOMETACARPAL ARTHROPLASTY: CLINICAL AND FUNCTIONAL OUTCOMES IN THUMB CMC OSTEOARTHRITIS

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Introduction: Osteoarthritis (OA) of the first carpometacarpal (CMC) joint is the second most common site of primary hand OA and affects up to 70% of the general population, although only 6% become symptomatic, particularly postmenopausal

women. Recent advances in thumb CMC arthroplasty include the introduction of the dual-mobility concept derived from hip arthroplasty, characterized by a double-sided concentric metal-polyethylene articulation designed to improve implant stability and functional range of motion. Despite these innovations, postoperative management remains controversial, with no shared guidelines regarding immobilization or rehabilitation timing. From the perspective of restoring functional “balance” of the thumb—between stability, mobility, strength, and pain—early mobilization may represent a promising strategy to enhance outcomes without increasing complications.

Aim: The study aims to evaluate the clinical and functional outcomes of patients with thumb CMC osteoarthritis treated with dual-mobility trapeziometacarpal arthroplasty followed by an early-mobilization rehabilitation protocol that avoids any postoperative immobilization. Early mobilization aligns with recent literature trends and may provide improved functional recovery compared with traditional immobilization strategies.

Material & Methods: Seventy-five patients undergoing dual-mobility CMC arthroplasty were evaluated. Clinical questionnaires (QuickDASH and VAS for pain) and functional assessments—including range of motion (Kapandji score), grip strength and key-pinch strength—were performed preoperatively and at 2 weeks, 1 month, 4 months and 12 months postoperatively. This standardized follow-up allowed for consistent evaluation of pain reduction, functional balance recovery, and progressive strength restoration.

Results: Pain in the operated hand improved rapidly, with VAS scores decreasing from 6.2 preoperatively to 2.1 at 2 weeks and 1.0 at 1 month. Thumb range of motion showed an early and marked improvement, with Kapandji scores reaching 9 by the 2-week assessment. Grip strength initially decreased at the 2-week evaluation but subsequently improved significantly by 1 month, eventually approaching preoperative levels. Overall upper-limb function, as assessed by QuickDASH, did not improve during the first month; however, at the 4-month follow-up the score was reduced by more than 50% compared with baseline, and by 12 months it had improved by approximately 80% from the initial value, indicating substantial functional recovery and re-establishment of thumb and hand balance.

Conclusion: Dual-mobility thumb CMC arthroplasty combined with a no-immobilization early-mobilization protocol results in rapid pain reduction, early recovery of thumb mobility and progressive improvement in grip strength, ultimately leading to marked enhancement of upper-limb function. These findings support early mobilization as a safe and effective strategy to restore functional balance after trapeziometacarpal arthroplasty. Further comparative studies are warranted to define standardized postoperative guidelines.

A-0506 DISTAL RADIUS FRACTURE FIXATION UNDER WALANT- A SERVICE EVALUATION

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Introduction: Wide Awake Local Anesthesia No Tourniquet (WALANT) has been used in an increasing number of operations including more extensive operations over the last few years. It provides adequate anaesthesia and effective haemostasis without the need for regional or general anaesthesia. In our department it is becoming common practice in the fixation of distal radius fractures.

Aim: The aim of this study was to evaluate the efficacy and safety of the WALANT technique in open reduction and internal fixation (ORIF) of distal radius fractures and the outcomes in our department.

Material & Methods: Fourteen patients with distal radius fractures underwent ORIF under WALANT. A mixture of 250 mL normal saline (0.9 %), 1 mL adrenaline 1:1000, 50 mL lidocaine 2 % and 12.5 mL 8 % bicarbonate was used to infiltrate the subcutaneous tissues and the periosteum volarly, dorsally, radially and over the distal ulna. 60ml of the mixture

were used for each patient totally 11 of those had traditional volar approach and plate, 1 had volar and dorsal fixation, 1 volar and radial and 1 had fixation of both distal radius and ulna. Operative duration, intraoperative haemostasis, patient cooperation, and postoperative recovery were documented. VAS score was used to assess perioperative pain, while radial height, radial tilt and inclination were measured postoperatively.

Results: All patients tolerated the procedure well and were discharged straight after the operation. Haemostasis was adequate in all cases and there was no need for tourniquet use. VAS scores were low (mean of 2.4). All radiological measures improved within the accepted limits in the literature. All patients rated the experience as very good or excellent. No complications were recorded in any of the patients in this group.

Conclusions: WALANT proved to be a safe and effective technique for the internal fixation of distal radius fractures, ensuring sufficient anaesthesia, excellent intraoperative conditions, and satisfactory postoperative function. The absence of a tourniquet and the elimination of general or regional anaesthesia render the method particularly advantageous, especially in patients with elevated anaesthetic risk. Further comparative studies are needed to evaluate if it could be superior to traditional anaesthetic methods.

A-0507 SECONDARY WOUND CLOSURE OF THE FOREARM USING FOLEY CATHETERS AFTER OSTEOSYNTHESIS OF A GALEAZZI FRACTURE-DISLOCATION: TECHNIQUE AND CASE REPORT

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Introduction: Closed diaphyseal fractures of the radius in adults are typically managed with open reduction and internal fixation (ORIF). However, the surgical exposure and associated postoperative hematoma often render primary wound closure difficult, posing a significant challenge for the orthopedic surgeon. In such circumstances, secondary wound closure techniques may be necessary to achieve optimal soft tissue healing.

Aim: To describe a modified secondary wound closure technique using Foley catheters following ORIF for a Galeazzi fracture-dislocation and to present the clinical outcome of its application in a single patient.

Material & Methods: A 30-year-old male patient presented to our hospital after a road traffic accident, sustaining a Galeazzi fracture-dislocation. The patient underwent open reduction and internal fixation within 24 hours of admission. Following fixation, primary wound closure was not possible due to marked soft tissue edema. A modified shoelace technique was employed, using Foley catheters anchored with 2-0 Nylon sutures to achieve gradual approximation of the wound edges without tension. Controlled tightening was performed at scheduled intervals to promote progressive closure. The target was complete wound healing within 20 to 25 days.

Results: Gradual wound closure was achieved over a 20-day period by applying controlled tension at regular intervals on the 3rd, 6th, 9th, and 12th postoperative days. Complete wound healing without complications was observed on day 20. No signs of infection or wound dehiscence were detected at the three-month follow-up. At six months, radiographic evaluation confirmed full bone union of the fracture.

Conclusions: The described method provided a safe, simple and effective approach to secondary closure, ensuring soft tissue integrity and an uncomplicated recovery.

A-0508 MEDIAN NERVE AXONOTMESIS FOLLOWING BLEOMYCIN ELECTROSCLECTROTHERAPY: A CASE STUDY OF A SIGNIFICANT COMPLICATION FOLLOWING TREATMENT FOR A LYMPHOVASCULAR MALFORMATION

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Introduction: Bleomycin electrosclectrotherapy (BEST) is a recently introduced treatment for the management of lymphovascular malformations that combines intralesional Bleomycin injection under image guidance with a precisely modulated electrical field to enhance cellular uptake. This technique is reported to have a favourable safety profile, with only mild adverse effects such as transient pain and pigmentation.

Clinical case: This is a case of a 20-year-old female patient who presented with severe, intractable left forearm and hand pain following BEST treatment for a forearm lymphangioma. Examination revealed neuropathic pain along with sensory deficit in the median nerve distribution. Given clinical concern for compartment syndrome, urgent surgical exploration of the forearm and a four-compartment fasciotomy were performed. Post-operatively, there was no relief from the fasciotomy, and the clinical picture developed to indicate a direct non-thermal electrical injury of the median nerve as the most likely pathology. Investigations by the clinical team identified that the electrostimulation probe used during the BEST treatment had a distorted probe geometry, and it was suspected that this caused an irreversible electroporation of the median nerve axons as a result of the concentrated electrical field.

Conclusions: This case represents, to our knowledge, the first report of median nerve axonotmesis following BEST. Deformation of the electrode geometry may significantly increase focal field strength, resulting in unintended nerve injury. BEST has a demonstrated efficacy and safety in the treatment of lymphovascular malformations; however, awareness of this risk is essential for clinicians to enable an informed discussion and appropriate management of post-operative complications that may mimic compartment syndrome.

A-0509 SURGICAL MANAGEMENT OF A PURE TENDINOUS MALLET THUMB: A CASE REPORT OF A RARE ENTITY

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Introduction: Mallet thumb is an extremely rare injury of the thumb, with only a few cases mentioned in literature. It results from disruption of the terminal insertion of the extensor pollicis longus (EPL) tendon, leading to loss of active extension at the interphalangeal joint. Due to its rarity, optimal management remains a matter of debate. While conservative treatment may be sufficient in some cases, surgical repair is often preferred for patients with high functional demands or when non-operative management is considered inadequate

Aim: The purpose of this report is to present the clinical course, surgical treatment and outcome of a patient with a pure tendinous mallet thumb without associated fracture.

Material & Methods: A 45-year-old male presented with loss of active extension at the interphalangeal joint of the right thumb following a sports-related injury. The patient reported a sudden snapping sensation at the time of trauma, followed by inability to actively extend the thumb. Physical examination revealed a flexed posture of the interphalangeal joint with no open wound or swelling. Passive extension was preserved, but active extension was absent. Radiographic evaluation excluded an avulsion fracture, confirming a pure tendinous rupture of the EPL insertion. Given the patient's

high functional demands and the complete loss of active extension, surgical treatment was selected. Through a dorsal approach, the ruptured tendon was identified and repaired using non-absorbable sutures. A K-wire was temporarily placed to hold the interphalangeal joint in slight hyperextension. The K-wire was removed after six weeks, followed by a gradual mobilization protocol under protection with a removable splint.

Results: The postoperative course was uneventful. The patient began protected mobilization at six weeks and achieved full active extension without extension lag at twelve weeks. Final evaluation demonstrated satisfactory range of motion and grip strength comparable to the contralateral thumb. No complications such as infection, tendon rerupture or stiffness were observed. The patient returned to normal daily activities and light sports participation at three months postoperatively, reporting complete satisfaction with the functional outcome.

Conclusions: Pure tendinous mallet thumb is rare and often underdiagnosed and careful differentiation from more proximal tendon ruptures is essential. Surgical management can provide excellent functional outcomes, particularly in patients with high functional demands.

A-0510 EARLY INTEGRATED REHABILITATION FOLLOWING INDEX POLLICIZATION IN A TODDLER WITH CONGENITAL THUMB APLASIA: A CASE REPORT

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Introduction: Functional recovery after index pollicization for congenital thumb aplasia requires not only anatomical reconstruction but also global neuromotor reorganization. Conventional rehabilitation usually emphasizes isolated hand training, whereas integrated early approaches may enhance cortical adaptation through postural, sensory and musculoskeletal synergy. This case report describes an early multidisciplinary rehabilitation protocol prioritizing global integration and spontaneous functional use during the neuroplastic window following index pollicization in a toddler with Blauth type V thumb hypoplasia.

Aim: The aim was to demonstrate how an early, multidimensional rehabilitation program can promote functional symmetry and support cortical acceptance of the reconstructed thumb in early childhood.

Material & Methods: A 1.5-year-old boy with right congenital thumb aplasia (Blauth V) underwent index pollicization on 15 Jul 2025 by using a modified Ezaki–Carter technique involving microdissection of neurovascular bundles, osteotomy of the second metacarpal (45° abduction; 100–120° pronation), transosseous K-wire fixation, dorsal capsular suturing and tendon transfers. Following postoperative immobilisation, rehabilitation started on 02 September with a structured 12-week programme integrating protective care, sensory modulation, proximal loading and functional engagement through bimanual activities. Outcomes were monitored using the BESTA Scale, caregiver responses to the Pediatric Upper Extremity Motor Activity Log (PMAL) and qualitative assessment of grasp and postural symmetry.

Results: After 10 weeks of rehabilitation, the child demonstrated stable grasp, voluntary activation of the reconstructed thumb and improved right-sided weight-bearing during stance and gait. By the end of the 13-week program, spontaneous use of the reconstructed thumb was consistently observed during play and self-care activities, including dressing, holding a cup and tearing paper. During gross grasp tasks, the child frequently used the reconstructed thumb in opposition, indicating effective functional integration. For fine manipulation, however, a predominantly palmar grasp strategy remained the preferred pattern. The BESTA score improved from 1, corresponding to palmar grasp, to 2, indicating whole-hand, radial or three-finger grasp, with stable prehension of lightweight objects. PMAL caregiver reports indicated frequent

use of the operated hand in gesturing, overhead reaching, pushing objects on the floor, holding or throwing a ball and tasks requiring support; intermittent use during eating, dressing, page turning, pressing buttons and manipulating small objects; and limited use in actions requiring refined rotational control, such as turning doorknobs. The caregiver also reported progressive adaptation of motor commands previously directed to the index finger, suggesting ongoing cortical remapping. No surgical complications occurred beyond transient postoperative edema, which resolved during the follow-up period. A mild withdrawal reflex during washing persisted initially but diminished with sensory habituation. Conclusions: An early multidisciplinary rehabilitation protocol prioritizing global integration and spontaneous functional use during the neuroplastic window following index pollicization in a toddler with Blauth type V thumb hypoplasia is effective in combination with hand therapy and the use of an orthosis after surgery.

A-0511 EXTENSIVE UPPER LIMB SARCOMA – A CASE SERIES ADVOCATING FOR LIMB SALVAGE

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Introduction: The treatment of upper limbs sarcomas which involve multiple tissue planes has traditionally been amputation. However, current advances have allowed a trend towards limb salvage, through neoadjuvant chemotherapy, surgical excision and postoperative radiotherapy.

Material & Methods: We present our experience from a national sarcoma centre, where we have successfully treated large upper limb sarcomas involving bone and soft tissue using this protocol.

Results: We present three illustrative cases over the last four years with large sarcomas involving multiple tissue planes and composite involvement of bone and soft tissue. One patient had a surgical excision with staged reconstruction following fast tracked histology. The other two patients had concurrent resection and reconstruction. All patients required free tissue transfer. One patient required free vascularised bone graft. All the patients required tendon transfers and rehabilitation. Tumour free margin was achieved in all cases were disease free at the time of preparation of abstract. Clinical profile, management decisions and surgical reconstruction will be discussed.

Conclusions: Our case series show that even extensive upper limb sarcomas involving multiple tissue planes can be successfully resected and reconstructed, given a systematic holistic approach, aggressive debridement and creative reconstruction

A-0512 A PROPOSED 'BONE RECONSTRUCTIVE LADDER' FOR SEGMENTAL BONE DEFECTS: TRANSLATING THE PRINCIPLES OF SOFT TISSUE RECONSTRUCTION INTO ORTHOPAEDIC PRACTICE

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Introduction: The concept of the reconstructive ladder, long established in plastic and reconstructive surgery, provides a structured pathway of increasingly complex interventions from the simplest closure methods to free tissue transfer. A similar reconstructive pathway has not been previously described for bone reconstruction.

Material & Methods: We propose an analogous framework for bone reconstruction in orthopaedic and reconstructive surgery, termed herein the "Bone Reconstructive Ladder". We provide clinical cases with pictures that illustrate this reconstructive ladder.

Results: The ladder spans from primary internal fixation (as a form of “primary closure”) through secondary intention (callus healing / adjunctive stimulation), cancellous grafts, corticocancellous grafts, local vascularised bone transfer, regional pedicled bone flaps, distant pedicled bone flaps and free vascularised bone flaps, culminating in composite osteocutaneous free flaps. We have developed an analogous reconstructive ladder demonstrated with clinical cases that highlight the utility of this framework.

Conclusions: This paper outlines the rationale for such a structured framework, details the proposed ladder, and discusses potential utility, benefits, and limitations. Adoption of a bone-reconstructive ladder may enhance conceptual clarity, facilitate multidisciplinary planning, and support teaching and decision-making in complex bone defect reconstruction.

A-0513 THE EFFECT OF ACTIVITY-BASED REHABILITATIVE GAMES ON DAILY LIVING ACTIVITIES AND OCCUPATIONAL PERFORMANCE IN INDIVIDUALS WITH FLEXOR TENDON INJURIES

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Introduction: Flexor tendon injuries (FTIs) are significant clinical problems that require prolonged rehabilitation processes and can cause severe loss of hand function, negatively affecting individuals' occupational performance. Performance in daily living activities such as dressing, personal hygiene, and food preparation is directly affected after hand injury, and this impact can lead to problems in physical, psychological, and social areas. These problems also cause changes in individuals' occupations. There is a strong relationship between participation in occupations and health and well-being; therefore, it is recommended to go beyond the standard treatment protocol to enable individuals to safely continue their occupations. Intensive exercise and repetition are crucial in hand rehabilitation. Gamifying repetitive tasks with technology to make treatment sustainable and motivating can enhance the therapeutic effect.

Aim: The aim of this study was to investigate the effect of activity-based rehabilitative games on activities of daily living (ADLs) and occupational performance in individuals with flexor tendon injuries.

Material & Methods: The study included 20 individuals aged 18–65 years who had undergone surgery approximately two months prior due to a Zone 2–3 flexor tendon injury and had completed a conventional rehabilitation process. Participants were randomly assigned in order of admission to two groups: Activity-Based Technological Rehabilitation (ABTR) and Activity-Based Traditional Rehabilitation (ABTR). Range of motion (ROM) was assessed using a goniometer and Secure HandROM; grip strength was evaluated using a dynamometer and pinch meter. Activity limitations were measured with the QuickDASH, and occupational performance was assessed using the Canadian Occupational Performance Measure (COPM). Both groups received a 6-week intervention program consisting of 12 sessions (2 sessions per week).

Results: Post-intervention evaluations showed significant improvements in ROM, grip strength, QuickDASH, and COPM scores in both groups ($p < 0.05$). The ABTR group showed greater improvement in COPM performance and satisfaction scores ($p < 0.05$).

Conclusions: These findings suggest that activity-based rehabilitative games are more effective in improving certain functional skills and occupational performance in individuals with flexor tendon injuries, and may be a viable method for clinical use.

A-0514 ENDOSCOPIC CARPAL TUNNEL RELEASE: A SINGLE-CENTER RETROSPECTIVE STUDY OF 288 CASES

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Introduction: Carpal tunnel syndrome (CTS) is the most prevalent entrapment neuropathy of the peripheral nerves. Endoscopic carpal tunnel release (ECTR) is a well-established surgical technique for the treatment of carpal tunnel syndrome. When compared with the open approach, there is evidence suggesting faster recovery and lower scar morbidity, while maintaining a comparable safety profile.

Aim: This study aims to retrospectively analyze the clinical outcomes and patient satisfaction following ECTR performed in a single center in Portugal.

Material & Methods: A retrospective study was conducted including 288 consecutive ECTR interventions between 2017 and March 2025 in a single hospital by an experienced surgeon. Data were collected from electronic clinical records, including demographic information, complications and operative time. To assess postoperative outcomes, patients were contacted and asked to complete the Boston Carpal Tunnel Questionnaire and a global satisfaction score on a 1-to-5 scale (1 = very dissatisfied; 5 = very satisfied). Statistical analysis was performed using IBM SPSS Statistics software.

Results: A total of 288 procedures were performed in 235 patients, of whom 75.3% were female. The median age was 55 years. The median operative time was 9 minutes (IQR 7–11.25) measured from surgical incision to wound closure. Minor complications occurred in 29.5%, including pillar pain (20.5%), painful scar (8.7%), wound dehiscence (2.1%), transient hypoesthesia (1.4%) and wound drainage (0.3%). Pillar pain had a mean duration of 9.9 ± 6.1 weeks, while transient hypoesthesia lasted 3 to 9 months (mean 5.5 ± 2.6). Major complications occurred in two patients (0.7%) both involving nerve injury that required reoperation and resulted in full postoperative recovery. In the subgroup evaluated between 2023 and 2025, postoperative Boston Carpal Tunnel Questionnaire and satisfaction scores indicated favorable functional outcomes and good levels of patient satisfaction.

Conclusions: Despite the inherent limitations of its retrospective design, this study benefits from a large sample of 288 procedures performed over an eight-year period, reflecting the real-world practice of a hand and wrist–dedicated surgeon. The complication profile observed in this cohort is consistent with previously published ECTR series. Notably, the major complications occurred early in the adoption of the technique, supporting the presence of a learning curve. Overall, the procedure demonstrated a favorable safety profile and positive clinical outcomes in this single-center cohort.

A-0515 SOFT TISSUE DEFECTS IN THE HAND FOLLOWING TRAUMA OR TUMOR EXCISION: RECONSTRUCTION USING THE QUABA FLAP – A CASE REPORT

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Introduction: Reconstruction of soft tissue defects in the fingers is challenging due to limited local tissue availability. Areas such as the dorsum of the hand near the MCP joint, the dorsal phalangeal region extending to the DIP joint, interdigital web spaces, and distal palmar region benefit from the Dorsal Metacarpal Artery Perforator (DMAP) flap. The Quaba perforator originates from the dorsal branch of the common digital artery, venous drainage occurs through accompanying veins with reverse flow and The Quaba flap is non-sensory.

Materials and Methods: This study evaluates a 72-year-old female patient who presented in June 2024 with a non-healing wound on her right hand for approximately 9 months.

Findings: On examination, a 2x2 cm defect was found in the second web space of the right hand. Despite previous treatments with wound creams and antibiotics, the wound worsened, leading to an incisional biopsy that revealed squamous cell carcinoma. Scans showed no metastasis. The Quaba flap, which can be raised from the intermetacarpal space and distal extensor retinaculum, was chosen.

During surgery, the mass was excised with safe margins, including the paratenon of the second and third digits. A 2.5x7 cm Quaba flap extending from the dorsal D2 and D3 metacarpal dorsal to the distal wrist dorsal was designed to close the defect. The flap was elevated over the digital bundle at the level of the metacarpal and over the paratenon towards the wrist., and hemostasis achieved. The donor site defect was closed with FTSG

Postoperatively, the flap's circulation and adaptation were monitored, with no complications observed.

Discussion: The Quaba flap is a good treatment option in terms of being a single-session flap that allows finger mobilization, good compatibility with the skin color tone in the area where it is used, allowing the use of more than one flap to close multiple defects, being an extensible flap to close larger defects, and an acceptable donor site morbidity. However, the flap has limitations, such as lack of sensory function and difficulty closing defects larger than 2 cm at the donor site. Additionally, accessing the distal palmar and proximal phalangeal surfaces may increase venous return, and the hairy dorsum of the hand may affect aesthetic outcomes, particularly in individuals with darker skin tones.

Although the digital island flap, which can be used for defects in this region, provides an advantage because it has sensation, it is disadvantageous because the main digital artery is sacrificed and it may cause flexion contracture at the PIP joint level after healing due to the location of the incision line.

Conclusion: The Quaba flap is a reliable, distal-based perforator axial flap that effectively reconstructs soft tissue defects. It is simple to perform, has minimal complications, and provides good functional and aesthetic outcomes, making it a safe option for hand reconstruction

A-0516 ANOMALOUS FUNCTIONAL LUMBRICAL MUSCLE CAUSING CARPAL TUNNEL SYNDROME: A CASE REPORT

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Introduction: Anatomical variations within the carpal tunnel can contribute to compression of the median nerve. This more commonly can include abnormal flexor digitorum superficialis or palmaris profundus muscle bellies underneath the transverse carpal ligament.

Material & Methods: We report a rare case of an accessory lumbrical muscle found within the carpal tunnel in a patient with clinical carpal tunnel syndrome (CTS)

Results: The accessory lumbrical muscle was found to be a functional lumbrical muscle to the middle finger. On division of the transverse carpal ligament without resection of this muscle, the patient had clinical resolution of their symptoms.

Conclusions: This case is the first to show high quality images of these lumbrical muscles actively functioning in a patient with carpal tunnel syndrome. This highlights the importance of considering anatomical variations in patients with CTS. Careful intraoperative inspection is essential to identify and address these anomalies, ensuring resolution of symptoms, without impairing function.

A-0517 USABILITY AND FUNCTIONALITY OF A CONVERSATIONAL HAND SURGERY COMPANION CHATBOT FOR UNDERGRADUATE AND POSTGRADUATE TRAINEES: PROTOCOL FOR A MIXED-METHODS EVALUATION

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Introduction: Early clinical training in hand surgery is constrained by limited supervised time, rapidly evolving evidence, and variability in on-call exposures. Conversational AI tools could offer on-demand guidance aligned to common educational and clinical tasks; however, their usability, functional coverage, and perceived safety among trainees remain insufficiently characterised.

Aim: To evaluate the usability, perceived usefulness, and functional performance of a hand surgery companion chatbot among medical students, house officers, and residents.

Material & Methods: Design and setting: Single-centre, prospective, mixed-methods study conducted in a simulation/teaching environment.

Participants: Convenience sample of medical students in clinical years, house officers in surgical rotations, and residents in plastic/orthopaedic training programs. **Eligibility:** age ≥ 18 years, English fluency, and no prior formal use of the study chatbot; **exclusion:** inability to provide consent.

Intervention: Participants complete a standardized, time-boxed interaction with the chatbot to accomplish role-relevant tasks (e.g., triage reasoning for common hand conditions, pre-/post-operative counselling prompts, documentation scaffolding, and exam-style knowledge checks).

Outcomes: Primary—usability by the System Usability Scale (SUS). Secondary—task success rate (predefined acceptance criteria), time-on-task, error/override rate (instances where participants judge an output as unsafe or incorrect and choose an alternative), perceived workload (NASA-TLX), pragmatic usefulness (Usefulness/UMUX-Lite), and intention to use. Safety signals (requests answered with appropriate caution; hallucination flags) and functional coverage (proportion of tasks for which the chatbot provides an actionable, guideline-concordant pathway) are recorded against a pre-specified rubric created by hand surgery faculty.

Procedures: After consent and brief orientation, participants complete a baseline survey, then perform scripted scenarios on individual devices while screen capture and timestamps are recorded. Blinded faculty assess outputs against checklists derived from contemporary guidelines and textbooks. Immediately post-session, participants complete SUS, UMUX-Lite and NASA-TLX, and a short semi-structured interview exploring strengths, shortcomings, and trust.

Analysis: Quantitative outcomes will be summarized overall and by training level. Between-group differences will be compared with ANOVA or Kruskal-Wallis as appropriate; proportions with 95% CIs will be reported. Qualitative data will undergo rapid thematic analysis to identify usability pain points and feature requests. Sample size is pragmatic for feasibility (target 15–20 per group) to estimate SUS with acceptable precision.

Governance: Educational usability study with no patient data; deemed minimal risk. Participants provide written informed consent. No protected health information is entered. Conflicts of interest will be disclosed.

Results: Primary outcome is mean SUS and proportion achieving an a priori usability benchmark. Secondary outcomes include task success, time-on-task, workload, perceived usefulness, safety flags, and functional coverage, stratified by training level. We will report feasibility metrics (recruitment, completion rate, missing data) and summarize themes from interviews to guide iterative refinement. Final results will be presented at the meeting.

A-0518 CAPITATE SHORTENING THROUGH A TRANSVERSE INCISION FOR THE TREATMENT OF KIENBÖCK DISEASE

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Introduction: For Kienböck disease in patients with neutral or positive ulnar variance, treatment options include radial closing-wedge osteotomy or capitate shortening. Although capitate shortening is less invasive, its main drawback is the relatively visible dorsal wrist scar. To address this limitation, we developed a modified capitate-shortening technique using a small transverse incision and evaluated its clinical and radiological outcomes.

Aim: Between April 2021 and February 2024, we applied this technique in patients with Kienböck disease up to Lichtman stage IIb and with neutral or positive ulnar variance. Under fluoroscopic guidance, a 25-gauge needle was first inserted dorsally to identify the capitate waist approximately 5 mm distal to the distal radial border. A 3.4-mm cannulated headless screw guidewire was then placed through the 3rd web space toward the capitate. After confirming correct positioning on AP and lateral images, the needle site was marked and the guide pin was inserted more through capitate. A 2-cm transverse incision was made to access the capitate, which was osteotomized with a power saw and fixed with a headless compression screw along the pre-placed guidewire. Clinical outcomes, radiographic healing, and complications were assessed postoperatively and at final follow-up.

Material & Methods: Results: Thirteen patients (6 male, 7 female; median age 29 years, range 21–46) underwent surgery. Two presented with stage II, five with stage IIIA, and six with stage IIIB disease. Follow-up ranged from 12 to 38 months (mean 21). Mean VAS pain scores improved from 5.3 preoperatively to 2.1 at final follow-up. Quick DASH scores improved from 42 to 13. Grip strength increased from 48% to 82% of the contralateral side. No patient reported intrinsic muscle weakness or incision site tenderness. All osteotomies demonstrated radiographic union.

Conclusions: This modified capitate-shortening technique reduces dorsal scar visibility while providing reliable healing and favorable functional outcomes, without increasing the risk of complications.

A-0519 INTRAMEDULLARY CANNULATED HEADLESS COMPRESSION SCREW FIXATION OF PROXIMAL AND MIDDLE PHALANX FRACTURES: A RADIOGRAPHIC ANALYSIS

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Introduction: Phalangeal fractures account for about 18% of upper-limb fractures and are the most common fractures of the hand. Proximal and middle phalangeal injuries occur most often—particularly in the long and ring fingers—and can impair motion, grip strength and hand function. These injuries typically result from sports trauma, crush mechanisms or falls, and are more common in younger males and manual workers. Although sometimes considered minor, inadequate management may lead to malunion, stiffness and tendon adhesions. Operative fixation is recommended when fractures are unstable, displaced, malrotated or intra-articular. Intramedullary headless compression screws have become an appealing minimally invasive option, but their safe use depends on matching implant dimensions to the small and variable phalangeal canal.

Aim: To characterise radiographic morphologic parameters of the proximal and middle phalanges relevant to intramedullary fixation, and to compare them with dimensions of commercially available headless screws and intramedullary devices.

Material and methods: Standardised posteroanterior (PA) and lateral (LAT) radiographs of 250 phalanges (125 men, 125 women; 50 individuals per digit) were analysed. Measurements were performed on the Sectra IDS7 imaging platform and reviewed by a fellowship-trained hand surgeon, with magnification standardised. Values were referenced to the central longitudinal axis of each phalanx.

PA parameters included IM and cortical isthmus diameters, head width, base width, phalanx length and antegrade/retrograde distances to the isthmus. LAT parameters included IM and cortical isthmus diameters, head and base depth, phalanx length, antegrade/retrograde distances and dorsal entry distances for retrograde and antegrade approaches. Absolute cortical width was calculated as cortical minus IM isthmus diameter. Sex-based comparisons were performed, and measurements were matched with 40 commercially available implants.

Results: Mean age was 39.9 years (range 16–89) with no sex differences between digit groups. For the proximal phalanx, PA IM isthmus diameter was largest in the thumb (4.8 mm) and smallest in the little finger (2.9 mm). On LAT views, IM isthmus diameters were narrower (1.5–2.4 mm) and absolute cortical width averaged 2.9–4.5 mm.

For the middle phalanx, PA IM isthmus diameter ranged from 2.5 mm (ring) to 3.4 mm (middle). LAT IM isthmus diameters measured 1.2–1.5 mm, with absolute cortical width 2.2–3.6 mm.

Men had significantly larger cortical and osseous dimensions for nearly all parameters ($p < 0.01$).

Implant comparison showed that screws of 2.0–3.0 mm diameter most closely matched the IM canal of most digits, whereas devices ≥ 4.0 mm were appropriate mainly for the thumb and middle-finger proximal phalanx.

Conclusions: Phalangeal intramedullary canal dimensions vary substantially by digit and sex, with narrower values on lateral projections. Most 2.0–3.0 mm headless screws and intramedullary nails align well with native canal morphology, while larger implants suit only selected proximal phalanges. Accurate understanding of phalangeal anatomy is essential to optimise implant selection and reduce cortical breach risk during intramedullary fixation.

A-0520 HYPERSELECTIVE NEURECTOMY OF THE TERMINAL MOTOR BRANCHES OF THE ULNAR NERVE FOR THE TREATMENT OF SPASTIC ADDUCTED THUMB: ANATOMICAL DESCRIPTION AND FEASIBILITY

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Background : Adducted thumb, is a frequent clinical manifestation in cerebral palsy due, among other factors, to spasticity of the Adductor Pollicis (ADP). While botulinum toxin injections can be used as a first-line treatment with good functional outcomes, their effectiveness is temporary. Surgical treatments, such as selective peripheral neurectomy, can then be proposed to sustain these results. The aim of this study is to describe the branching pattern of the deep branch of the ulnar nerve up to its terminal branches (TBU) for the ADP, and to assess the feasibility of hyperselective neurectomy of these TBU.

Materials and Methods : A layered and atraumatic dissection of the ulnar nerve was performed on 20 upper limbs from 10 specimens, extending from the forearm to the hypothenar region, including interosseous branches and TBU. Photographic documentation and morphometric measurements were recorded. A secondary intraneural dissection was performed at the level of Guyon's canal to identify the fascicles destined for the ADP and the FPB. In 10 cases, commissural or thenar approaches were performed prior to dissection to allow targeted exposure of one of the TBU.

Results : The deep branch of the ulnar nerve measured on average 4.51 (± 0.74) cm in length and 1.8 (± 0.4) mm in diameter. It gives at least three TBU to the ADP and has close anatomical relationships with the superficial palmar arch. The thenar commissural approach made it possible to isolate the deep branch of the ulnar nerve just proximal to its TBU

in 80% of cases, versus 20% for the commissural approach. At the Guyon's level, if intraneural dissection of the deep branch was possible in 45% of specimens, it was not possible to achieve a fascicular dissection up to the terminal branches. Neurectomy at this level canal revealed multiple fascicles within the deep branch in all cases.

Discussion : Hyperselective neurectomy of the TBU appears to be a feasible option for the management of adducted thumb. Although the thenar approach has been described, its deep location, the frequent associated retraction of the first web space, and the need for an additional incision for release represent significant drawbacks.

In contrast, the commissural approach allows for simultaneous muscle release or skin-plasty; however, access to the TBU through this route appears unsafe due to its proximity to the arterial network. Nevertheless, a selective neurectomy could be performed more safely at the Guyon's due to proximal dissection fascicular exchanges, and potential associated consequences on third and fourth lumbricals and deep head of FPB muscle should be anticipated by selected electrostimulation.

Conclusion : An elective approach at the Guyon's canal with intraneural dissection and per operative fascicular stimulation could be a possibility for hyperselective neurectomy in spastic adducted thumb.

A-0521 WHAT CAN PATIENTS EXPECT AFTER THUMB CMC IMPLANT ARTHROPLASTY? PERSONALIZED PREDICTIONS FOR FUNCTION AND PAIN

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Introduction: Predicting patient-reported outcomes after thumb carpometacarpal (CMC) implant arthroplasty is statistically complex because scores are typically bounded, skewed, and influenced by non-linear relationships. In contrast to traditional regression models, machine learning approaches may better capture these characteristics.

Aim: The aim of our study was to develop and validate machine learning models for predicting hand function and pain one year after thumb CMC joint implant arthroplasty.

Material & Methods: We retrospectively analyzed data from 407 patients who received a Touch® prosthesis (KeriMedical, Switzerland) between 2018 and 2024 and were prospectively documented in a clinical registry. Two models predicted hand function (brief Michigan Hand Questionnaire [MHQ], 0-100) and pain during daily activities (Numeric Rating Scale [NRS], 0-10) one year postoperatively. We used zero-adjusted probabilistic gradient boosting (XGBoostLSS) with 23 clinical, radiographic, and patient-reported baseline variables to predict not only the most likely outcome but also the expected range of possible results for each patient. Models were trained and tuned using nested 5×5 cross-validation. Performance was evaluated using mean absolute error (MAE) and root mean squared error (RMSE), each with 95% bootstrap confidence intervals (CIs) to quantify uncertainty around the average error. Additionally, 80% prediction intervals (PIs) were generated for each patient, with calibration assessed by comparing empirical coverage with the nominal 80% target. Lower MAE and RMSE values indicate greater accuracy relative to each outcome's scale. SHAP (SHapley Additive exPlanations) values were used to identify key predictors and their directional effects.

Results: The function model achieved a cross-validated MAE of 9.0 and RMSE of 14.0, with 95 % bootstrapped confidence intervals of 8.1–9.8 and 12.5–15.5, respectively. The observed 78% prediction-interval coverage closely matched the 80% target, indicating well-calibrated uncertainty estimates. SHAP analysis showed that higher baseline function (brief MHQ), stronger grip strength, better general health, greater thumb mobility, higher surgical expertise, and younger age were associated with better predicted hand function one year after surgery.

The pain model achieved an MAE of 0.84 (95 % CI 0.79–0.89) and RMSE of 1.62 (1.47–1.77), with an observed 77% prediction-interval coverage close to the 80% target. Better general health, stronger grip strength, lower pain, younger age, and greater belief in treatment success predicted lower residual pain one year after surgery.

Conclusions: We developed interpretable, uncertainty-aware machine-learning models that provide individualized predictions for pain and function after CMC arthroplasty. Key predictors included grip strength, general health, and age, underscoring the clinical relevance of these factors for preoperative counseling.

A-0522 COMBINED THUMB CMC-1 JOINT PROSTHESIS AND STT JOINT PYROCARBON INTERPOSITION ARTHROPLASTY FOR PANTRAPEZIAL OSTEOARTHRITIS: A RETROSPECTIVE CASE SERIES WITH FUNCTIONAL FOLLOW-UP

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Introduction: Pantrapezial osteoarthritis involving both the first carpometacarpal (CMC-1) and scaphotrapeziotrapezoidal (STT) joints remains a surgical challenge. Prosthetic arthroplasty of the CMC-1 joint and pyrocarbon interposition arthroplasty of the STT joint have each demonstrated favourable outcomes regarding pain relief and functional recovery in isolated joint osteoarthritis. To our knowledge, simultaneous implantation of both devices in a single procedure has not yet been reported but has the potential of a shorter rehabilitation compared to traditional trapeziectomy - the current standard of care.

Aim: To evaluate radiological, functional and patient-reported outcomes following combined CMC-1 joint prosthetic and STT joint pyrocarbon arthroplasties in pantrapezial osteoarthritis. We hypothesize that this approach provides favourable functional recovery, pain relief and patient satisfaction.

Material & Methods: This retrospective study evaluated five hands treated with combined CMC-1 joint prosthesis and STT joint pyrocarbon implant for advanced pantrapezial osteoarthritis. Postoperative function was assessed by range of motion, grip and pinch strength, and patient-reported outcomes using the Michigan Hand Questionnaire (MHQ). Radiographs were analysed for complications, including implant dislocations and dorsal intercalated segment instability (DISI), defined by a radiolunate (RL) angle greater than 15°.

Results: Five hands in four patients (mean age 66 years) underwent combined CMC-1 joint (Touch[®]) and STT joint (Pyrocardan[®]) arthroplasty between 2023 and 2024. At a mean follow-up of 28.7 months, no radiologic signs of implant dislocation or calcification were observed. One intraoperative trapezial fracture was managed successfully with K-wire fixation and splinting. The postoperative median RL angle was lower (22 [8–44]°) than the preoperative value (35 [22–38]°), with complete correction of DISI deformity in one case. Median grip strength was slightly lower in the operated than in the contralateral hands (17.3 [10–33] kg vs. 22.3 [13.3–31] kg), whereas pinch strength was higher in the operated hands (8.3 [2–9.2] kg vs. 5.2 [3.3–6.8] kg). Postoperatively all patients demonstrated excellent thumb mobility, achieving a Kapandji scores of 10 and retropulsion of 2 to 3. MHQ scores were substantially higher for the operated than the contralateral hands, reflecting favourable patient-reported outcomes (total: 84 [41–85] vs. 58 [41–63]; pain: 10 [0–70] vs. 60 [40–75]; satisfaction: 75 [46–79] vs. 42 [42–46]; overall hand function: 80 [60–85] vs. 60 [45–60]).

Conclusions: Traditional trapeziectomy is still commonly performed for pantrapezial osteoarthritis, despite reports of longer rehabilitation and lower patient satisfaction compared with modern prosthetic techniques. A staged approach, reserving STT joint arthroplasty for cases with persistent pain after CMC-1 prosthesis implantation, may reduce initial costs, but prolongs recovery and requires a secondary procedure, potentially lowering patient satisfaction. Our findings suggest that combined CMC-1 joint prosthesis with STT joint pyrocarbon interposition arthroplasty provides favourable

functional outcomes, effective pain relief and high patient satisfaction. Further studies are needed to validate these results and confirm the advantages of this trapezium- preserving, dual- implant approach.

A-0523 : SYSTEMATIC REVIEW OF MID- TO LONG-TERM OUTCOMES FOLLOWING SMALL JOINT DENERVATION IN THE HAND

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Introduction: Osteoarthritis (OA) of the hand most commonly affects the distal interphalangeal (DIP), thumb carpometacarpal (CMC1), and proximal interphalangeal (PIP) joints. Joint denervation is gaining traction for treating small joint OA in the hand due to fast recovery and preserved range of motion, though longevity of the operations and mid- to long-term outcomes remain uncertain.

Aim: The purpose of this systematic review is to assess mid-term (≥ 2 y postoperative) outcomes following denervation for small joint hand OA.

Material & Methods: We completed a systematic review following the Cochrane guidelines and utilizing Covidence to assist with data extraction. This review was registered through PROSPERO. Two separate reviewers completed title, abstract, and full text screening as well as data extraction. Included articles were required to include outcome data in patients following denervation of the CMC1, PIP or DIP joints, have a mean of at least two years follow-up, and be published in English. Patient age, follow-up time, reoperation rates, and complications were weighted and pooled. Reoperation and complication rates were then evaluated through Forest Plots using the Paule-Mandel weighting method due to the binary nature of the outcomes.

Results: Eleven studies met inclusion criteria. Seven studies reported outcomes following CMC1 denervation for osteoarthritis in 205 patients (209 joints) and the weighted mean postoperative follow-up was 45.2 months. This cohort demonstrated an overall weighted complication rate of 8% and a reoperation rate of 13%. Twenty-four complications were reported, most commonly involving paresthesias at the surgical site (12 cases), recurrent pain (3), and hypertrophic scar formation (2). There were 31 reoperations, with the most common being conversion to CMC1 arthroplasty.

For DIP joint denervation, only one study was found so no results were analyzed.

For PIP joint denervation, we identified four studies including 82 patients (97 joints), with a mean postoperative follow-up of 52.4 months. Primary osteoarthritis was the most common diagnosis in the PIP joint cohort ($n=95$). These studies had an overall weighted complication rate of 19% and a reoperation rate of 4%. Of the 20 complications reported, the most common were complex regional pain syndrome (CRPS; 7 cases), paresthesias or transient paresthesias (7), hypoesthesia (2), and loss of two-point discrimination (2). Eight patients underwent reoperation, most commonly arthroplasty and arthrodesis.

Conclusions: Long-term outcomes of small joint denervation in the hand demonstrates high complication and reoperation rates, ranging from 4% to 19%. Most common complications include nerve related issues and reoperation which typically involved arthroplasty or arthrodesis. Data on these operations still limited secondary to relatively low sample sizes, lack of long-term follow-up, and inconsistent reporting of clinical and patient-reported outcomes. Future research should prioritize standardization of data reporting and inclusion of these data to improve our understanding of longevity and efficacy of these surgeries.

A-0525 METAPHYSEAL OBLIQUE ULNAR SHORTENING OSTEOTOMY: A PLATE-FREE TECHNIQUE FOR ULNAR IMPACTION SYNDROME

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Introduction: Ulnar impaction syndrome (UIS) is a common cause of ulnar-sided wrist pain. Conventional treatments include the WAFER procedure or ulnar shortening osteotomy (USO) with plate fixation, the latter being associated with a substantial rate of hardware-related complications.

Aim: To assess the effectiveness and safety of freehand metaphyseal oblique USO, performed without plate fixation, as an alternative technique for the management of UIS.

Material & Methods: A retrospective review included 34 patients operated between February 2019 and November 2024. An oblique dorsoulnar approach was used. The osteotomy was long, extra-periosteal, extra-articular, and oriented nearly parallel to the ulnar axis. Reduction was guided by a transosseous wire, and fixation was achieved with 2.0-mm bicortical screws. Pronosupination and radiographs were assessed after stabilization. Immobilization was maintained for 6 weeks in a Sarmiento cast.

Results: Mean osteotomy length was 58.8 mm (24–109), using 4–6 screws. All patients achieved union, with a mean healing time of 2.5 ± 1 months. Ulnar variance improved from +3 mm preoperatively to –1.3 mm postoperatively (mean shortening 4.3 mm). All patients reported pain improvement; three (9%) showed a mild reduction in pronosupination (10° loss of supination). Complications were rare: three hardware removals (9%), one ECU tendinitis, and no refracture or nonunion.

Conclusions: The freehand metaphyseal oblique USO provides reliable union, low hardware-related morbidity, and intraoperative flexibility for correction. Its technical simplicity and favorable clinical and radiological outcomes support its potential as an effective alternative to plate fixation for UIS, with the possibility of reducing reoperations and improving patient satisfaction.

A-0526 BEYOND BODY FUNCTIONS: INTEGRATING OCCUPATION-FOCUSED INTERVENTIONS IN HAND THERAPY

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Introduction: The primary focus of hand therapy is typically on hand function, which encompasses e.g., muscle coordination or joint stability. However, what has been insufficiently emphasised so far is that such complex processes should not only be effective during conscious or unconscious functional tasks in therapy, but especially during diverse and concurrent everyday activities. Therefore, it is necessary to bridge the gap between functional exercises and everyday tasks. Research indicates that occupation-focused interventions are already being used to a limited extent or in addition to other common interventions in hand rehabilitation. These interventions facilitate the transfer of learned skills into daily occupations. Moreover, they enhance compliance with therapy and increase motivation to use the affected limb, thereby preventing avoidance behaviours. In contrast, there is limited understanding of how therapists implement occupation-focused interventions.

Aim: The aim of this project was to discover how selected occupational therapists in Vienna define occupation-focused therapy as well as to explore their reasoning about when and how to apply occupation-focused interventions. Furthermore, the experts were asked whether this application influences the outcome from their perspective.

Material & Methods: To gather empirical evidence, six expert interviews were conducted with occupational therapists practising in Vienna. A deductive qualitative content analysis was selected for the content comparison. The categories were developed based on an interview guide and recorded in a coding guide with definitions, anchor examples, and coding rules. The statements from the interviews were then classified into four main categories and 22 subcategories. These were subsequently paraphrased, extracted, and summarised in terms of content structure.

Results: The analysis of the interviews showed that all participants apply an occupation-focused approach. The interventions described demonstrate the potential for occupation-focused methods to be integrated into hand therapy in a variety of ways. The participants described factors that promote and hinder the implementation of an occupation-focused approach. Overall, only positive effects on the outcome were mentioned.

Conclusions: Further research is needed to generate evidence supporting the use of occupation-focused approaches in Austria and to promote their nationwide application in practice. In future discussions on balance in hand therapy, the focus should extend beyond e.g., the equilibrium between intrinsic and extrinsic hand structures to encompass clients' occupational concerns and individual goals. This expanded view promotes a holistic approach to hand rehabilitation. Subsequently, this might enable patients not only to maintain, restore, or improve function, but also to achieve optimal participation in society and independence in daily life.

A-0527 DETERMINING THE APPLICABILITY OF THE PEDIATRIC PARENT-PROXY AND SELF-REPORT VERSIONS OF THE PROMIS UPPER EXTREMITY AND PAIN INTERFERENCE INSTRUMENTS

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Introduction: Current orthopedic research is expanding beyond clinical outcomes and toward Patient-Reported Outcomes Measurement (PROM) instrument tools. A widely used PROM in pediatric orthopaedics is the Patient-Reported Outcomes Measurement Information System (PROMIS) instrument. The patient and family's perceptions of these surveys' applicability in pediatric populations have been sparsely reported.

Aim: The aim of the current study was to evaluate the applicability of the PROMIS Upper Extremity (UE) and Pain Interference (PI) instruments in pediatric patients with upper extremity pathology.

Material & Methods: Pediatric patients (<18 years) and their caregivers were prospectively recruited from hand and upper extremity clinics at a single-academic medical center. Both completed PROMIS UE and PI CATs and two anchor-based applicability questions. Demographics, diagnoses, and interventions were collected and tabulated. Patient and parent-proxy mean PROMIS scores were compared using paired t-tests. Applicability was analyzed using a multivariable binary logistic regression to identify factors associated with responses of 'very' or 'moderately applicable'.

Results: A total of 184 PROMIS UE and PI surveys were completed (45 parent-proxy, 139 self-report). Most patients were male (60.7%) and UE fractures were the most common pathology (68.6%). High applicability was reported by 75.6% of parent-proxy respondents for PROMIS UE versus 57.8% for PROMIS PI, and by 68.3% of self-respondents for PROMIS UE versus 55.4% for PROMIS PI. Patients with higher PROMIS UE and PROMIS PI parent-proxy scores (severe functional impairment, and pain score ≥ 50) were significantly more likely to rate the surveys as having low applicability ($p < 0.05$). No significant associations were observed for any self-reported PROMIS UE or PI scores. Age of the patient was not found to have any significant relationship to applicability ratings.

Conclusions: PROMIS UE was rated slightly more applicable than PROMIS PI in pediatric upper extremity patients, with both surveys rated higher by patients than parent proxy respondents. Further, there may be additional room for improving

the applicability of these measurement tools for patients with greater functional impairment and when measuring pediatric pain.

A-0528 FDS SUTURE VERSUS FDS SLIP RESECTION IN COMBINED FDS AND FDP INJURIES IN ZONE 2

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Introduction: Traumatic flexor tendon ruptures in Zone 2 are demanding injuries, amongst other factors, the tendon canal is narrow, and the pulley system is obstructing the approach. Suturing the ruptures causes additional volume in the flexor tendon sheath due to suturing material and is responsible for scarring and adhesions. It is a known practice to sacrifice the flexor digitorum superficialis (FDS) tendon with one or both slips to provide more room for the flexor digitorum profundus (FDP) tendon suture, aiming to produce less complications and therefore reduce the need for reoperations, e.g. tenolysis. However, sacrificing the complete FDS tendon also excludes the possibility of isolated flexion of the proximal interphalangeal (PIP) joint and might reduce total grip strength of the involved finger.

Aim: The aim of our study is to compare FDS slip resection versus FDS tendon suture concerning complication rate, reoperation rate, range of motion, grip strength and patient-reported outcome measures in the long-term follow-up.

Material & Methods: Data were retrieved from a national multicenter flexor tendon cohort registry, with inclusion of patients from three university centers from 2014 to 2024. For this study, inclusion criteria were patients aged 18 years and older and flexor tendon injuries in Zone 2 of both the FDS and FDP tendons, which were operatively treated.

Results: A total of 179 met above mentioned criteria. Additional to the FDP suture, the FDS was sutured in 124 cases, the FDS was resected in 22 cases, and both (suture of one slip and resection of the other slip) was performed in 17 cases. 124 (69%) patients were male, and the dominant hand was injured in 82 (46%) of cases. The mechanism of injury was a clean cut with a sharp object in 155 (87%) of cases.

Of the 179 included patients, 12 (6.7%) suffered a rerupture of the sutured tendon(s). Seven reruptures (5.6%) occurred in the FDS suture subgroup, three (14%) in the FDS resection subgroup and two (12%) in the combined subgroup. Tenolysis needed to be performed in 15 (8.4%) cases in total, 9 (7.3%) in the FDS suture subgroup, 4 (18%) in the FDS resection subgroup and 1 (5.9%) in the combined subgroup. At the end of treatment, active full fist closure could be reached in 25 (18%) of the FDS suture patients, in 2 (7.7%) of the FDS resection cases and in 3 (18%) of the combined cases. Using a Jamar dynamometer, grip strength of the injured hand could be measured as follows: 36 (26-39) kg in the FDS suture subgroup, 33 (30-38) kg in the FDS resection subgroup and 28 (24-51) kg in the combined subgroup. DASH questionnaire survey shows measurements of 4.2 (0.83-8.3) in the FDS suture subgroup, 14 (0-28) in the FDS resection subgroup and 5.0 (5.0-5.0) in the combined subgroup.

Conclusion: No conclusive advantage of FDS suture or FDS resection could be proven in our cohort.

A-0529 MICROVASCULAR RECONSTRUCTION OF THE DISTAL RADIOULNAR JOINT USING A VASCULARIZED SECOND METATARSOPHALANGEAL JOINT TRANSFER: A BIOMECHANICAL AND SURGICAL FEASIBILITY ASSESSMENT

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Introduction: Destruction of the distal ulna and distal radioulnar joint (DRUJ) presents a major reconstructive challenge. We evaluated a biological reconstructive model using a vascularized transfer of the second toe metatarsophalangeal (MTP) joint to replace the distal ulna.

Aim: This study aimed to assess the biomechanical behavior and surgical feasibility of this microvascular reconstruction model.

Material & Methods: Six cadaveric forearms were analyzed using a motion laboratory system designed to produce controlled, reproducible pronosupination. Native DRUJ rotation was recorded (five trials per specimen). The DRUJ was then replaced by a vascularized MTP joint, and the rotation protocol was repeated.

Surgical feasibility was evaluated by performing the full reconstruction: determining a suitable approach, preparing the recipient bed, developing fixation strategies, and defining vascular anastomoses.

Results: The native DRUJ achieved a mean pronosupination arc of 122.5°. After MTP transfer, rotation remained substantial at 112.2°. Surgically, a dorsoulnar approach provided reliable access. A radial recess allowed proper seating of the transferred joint. Fixation was feasible with Kirschner wires, and microsurgical end-to-end anastomoses were successfully performed on the ulnar pedicle.

Conclusions: A vascularized MTP joint can biomechanically and surgically substitute for the DRUJ. The transferred joint integrates into the pronosupination arc and enables reconstruction of both osteoarticular and ligamentous structures, with acceptable donor-site morbidity. This technique may offer a reconstructive option for patients with post-traumatic distal ulna loss, tumor resection, or failure of salvage procedures and DRUJ prostheses.

A-0531 FINDING BALANCE WHEN MOTION IS LOST: THE ROLE OF INTRAMEDULLARY NAILING IN WRIST ARTHRODESIS

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Introduction: Loss of both anatomical alignment and functional balance in the wrist results in pain, reduced range of motion, and progressive impairment of hand function, the hallmark features of wrist osteoarthritis.

Total wrist arthrodesis is a well-established surgical procedure that provides reliable pain relief while preserving residual upper-limb function.

Several fixation methods have been described to achieve fusion, including Kirschner wires, staples, intramedullary nails, and dorsal plates.

Among them, intramedullary fixation offers a minimally invasive alternative that reduces the risk of extensor tendon irritation and can promote faster recovery by minimizing soft-tissue disruption.

Aim: To evaluate the clinical and radiological outcomes of total wrist arthrodesis using a locked intramedullary nail and to identify potential complications associated with the procedure.

Material & Methods: A single-center retrospective study was conducted between January 2021 to October 2025

Inclusion criteria: adult patients (>18 years old) who underwent wrist arthrodesis for any indication and provided informed consent.

Exclusion criteria: patients under 18 years of age and those without informed consent.

Need for bone graft, implant length, and inclusion of the third carpometacarpal (CMC) joint in the arthrodesis were collected as intraoperative variables. Meanwhile, achievement of fusion, time to consolidation and implant-related complications were collected as clinical outcomes.

Fusion was defined as effective when bone bridging was observed in at least 50% of the arthrodesis surface on biplanar radiographs or computed tomography (CT) scans when required.

All procedures were performed by the same surgical team through a dorsal approach. A titanium locked IM nail was used in all cases. Postoperatively, patients were immobilized in a forearm splint for 2 weeks, followed by progressive mobilization under supervision of a hand therapist.

Results: A total of 14 patients met the inclusion criteria, with males representing 71.5% of the cohort (n = 10). Median follow up: 12.5 months. The main indications for total wrist arthrodesis were: scapholunate advanced collapse (SLAC) (n = 3), scaphoid nonunion advanced collapse (SNAC) (n = 3), and Kienböck's disease (n = 3).

Bone consolidation was achieved in 85.7% of cases, with a mean time to union of 4 months, as confirmed radiographically. No implant-related complications were observed. These outcomes are consistent with previously reported fusion rates for dorsal plate fixation, suggesting comparable effectiveness with reduced soft-tissue morbidity.

The main limitations of this study are the small sample size and the heterogeneity of the included cases.

Conclusions: Intramedullary nailing represents a safe and effective surgical approach, achieving high rates of technical success and bone healing, with minimal mid-term complications and low reoperation rates.

Locked intramedullary nails can be considered a reliable and less invasive alternative to dorsal plating for total wrist arthrodesis.

Larger prospective studies are necessary to confirm these preliminary findings and to establish standardized surgical protocols.

A-0532 THE OSTEOCHONDRAL AUTOGRAFT TRANSFER SYSTEM IN HAND SURGERY: A COMPREHENSIVE EVIDENCE-BASED GUIDE FOR THE HAND SURGEON

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Introduction: The Osteochondral Autologous Transfer System (OATS) is a surgical technique initially developed for knee procedures to address focal articular cartilage defects. While widely applied in the knee, elbow, shoulder, and ankle, its application in hand surgery is limited but growing. This review aims to compile evidence-based insights into OATS for hand surgery, focusing on indications, technical nuances, outcomes, and donor site morbidity. Additionally, a demonstrative case is presented showcasing the reconstruction of a capitate using OATS.

Aim: This review aims to compile evidence-based insights into OATS for hand surgery, focusing on indications, technical nuances, outcomes, and donor site morbidity. Additionally, demonstrative cases are presented showcasing different indications and outcomes using OATS.

Material & Methods: The systematic review followed PRISMA 2020 guidelines and was registered on PROSPERO. Electronic databases (PUBMED, Google Scholar, Cochrane Library) and ClinicalTrials.gov were searched for studies up to August 1,

2024, using the keywords: OATS, osteochondral autologous transplantation system, hand, and wrist. Eligible studies included clinical applications of OATS in hand surgery with follow-up data. Case reports, series, and cohort studies were appraised for quality and risk of bias. Additionally, a narrative review addressed practical questions for hand surgeons. Results: Thirteen studies met the inclusion criteria, encompassing case reports and small series involving up to 11 patients. Indications for OATS in hand surgery included reconstruction of the lunate fossa, carpal bones, metacarpal heads, and interphalangeal joints. Favorable outcomes were reported, with donor sites including the lateral femoral condyle, medial femoral trochlea, and hemi-hamate bone. Donor site morbidity was rare but included exertional knee pain and radiological degenerative changes. The demonstrative cases highlighted the utility of OATS in hand surgery with satisfactory functional and radiological outcomes.

Conclusions: OATS shows promise in addressing osteochondral defects in the hand, with favorable outcomes across various applications. Although evidence remains limited to small case series and reports, the technique demonstrates potential as a motion-preserving option. Future research should address donor site morbidity in healthy knees and explore the feasibility of allograft use.

A-0533 ULTRASOUND-GUIDED TENOLYSIS FOR EXTENSOR TENDON ADHESIONS AFTER PHALANX FRACTURES, A CASE SERIES

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Introduction: Extensor tendon adhesions in Zone 4 after proximal phalanx fractures remain a common cause of stiffness and impaired hand function, affecting nearly one-quarter of patients. Despite advances in fixation and rehabilitation, peritendinous fibrosis continues to restrict Total Active Motion (TAM). Surgical tenolysis is the standard option for refractory cases but carries risks of recurrence due to surgical trauma. Ultrasound-guided peritendinous hydrodissection, originally described for adhesive capsulitis and nerve entrapments, may offer a less invasive alternative. This study evaluates the feasibility, safety, and outcomes of ultrasound-guided hydrodissection of extensor tendons (USHyE) in post-traumatic adhesions.

Aim: Authors study the feasibility of ultrasound-guided tenolysis of extensor tendon adhesions after proximal phalanx fractures using hydrodissection

Material & Methods: A prospective case series was conducted between January 2024 and January 2025, enrolling 8 consecutive patients (6 women, 2 men; mean age 41 years) with symptomatic Zone 4 extensor tendon adhesions following proximal phalanx fractures. All had failed at least six months of structured hand therapy and presented with TAM $\leq 20^\circ$ and ultrasound evidence of adhesions. Exclusion criteria were prior tenolysis, infection, or systemic disease. Under real-time ultrasound, hydrodissection was performed with a 25-gauge needle using 0.8–1.2 mL of 1% lidocaine and 5% dextrose solution to mechanically separate tissue planes. Patients began immediate supervised mobilization. Outcomes included TAM, Visual Analog Scale (VAS) for pain, and Patient-Rated Wrist/Hand Evaluation (PRWHE), assessed at baseline, 3 weeks, 3 months, and 6 months.

Results: All 8 patients completed follow-up without complications. Mean TAM improved from 180° at baseline to 225° at 3 weeks (mean gain 45°), with 7 of 8 patients (87.5%) exceeding the minimal clinically important difference ($>20^\circ$). VAS scores decreased from 5.1 to 1.6, while PRWHE scores showed parallel improvement. Gains were maintained at 3- and 6-month follow-ups. No adverse events such as infection, rupture, or nerve injury occurred, and no patient required secondary tenolysis.

Conclusions: USHyE is a safe, well-tolerated, and effective technique for managing Zone 4 extensor tendon adhesions after proximal phalanx fractures. It provides consistent motion gains, reduces pain, and supports early rehabilitation. These findings suggest USHyE as a promising minimally invasive alternative to surgical tenolysis, warranting larger controlled trials for validation.

A-0534 A NEW TECHNIQUE FOR TRAPEZIUM RESECTION, LIGAMENT RECONSTRUCTION AND TENDON INTERPOSITION ARTHROPLASTY FOR TRAPEZIO-METACARPAL OSTEOARTHRITIS. CASE SERIES AND EARLY RESULTS

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Introduction: Basal thumb osteoarthritis is a common diagnosis. Multiple surgical procedure for it's treatment have been developed. Among them, trapezium resection with ligament reconstruction and tendon interposition arthroplasty is generally accepted as the gold standard. Nevertheless, they are technically demanding and there is a wide variety in the surgical approach, the tendon of choice and in the specific form of ligament reconstruction. We have developed a surgical procedure combining several preexisting techniques. We believe that by doing so a more reliable, easier and reproducible method with constant results has been achieved. It is now our treatment of choice in all cases of basal thumb osteoarthritis.

Aim: To describe a new technique for carpometacarpal arthroplasty of the thumb and to provide a qualitative and quantitative assessment of early results in a consecutive series of patients with carpometacarpal arthritis using this technique.

Material & Methods: Between November 2024 and November 2025, 11 arthroplasties in 9 patients were performed. All patients were evaluated at two weeks, and will have been evaluated at six weeks, 3 months and at the maximum follow up reached by the time this work is presented based on clinical outcome, presurgical and postsurgical x-ray evaluation, and range of motion, grip-strength, and pinch-strength values.

The surgical technique is done through a Wagner approach, trapeziectomy is performed with osteotome and rongeur, a hemi FCR graft is obtained with the technique described by Schecker but using #5 sternal suture and the suspension arthroplasty is described as done by Weiss but using the tendon graft instead of a suture. Patients are immobilized for 6 weeks.

Results: At the moment, all patients have been highly satisfied and good to excellent results have been achieved except for one case which required a second surgery because of ongoing scapho-trapezoid arthrosis.

Conclusions: At the moment promising results have been achieved. We believe that by joining several techniques, this form of arthroplasty is easier to perform, more reproducible and takes a shorter surgical and recovery period compared to other procedures. Results are similar to other ligament reconstruction tendon interposition arthroplasties.

A-0535 THE HIDDEN WEIGHT OF DISTAL RADIUS FRACTURE FIXATION: A WASTE AUDIT TO DETERMINE VARIATIONS IN UNDUE WASTE BASED ON DIFFERING HOSPITAL SETTINGS

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Introduction: Distal radius fractures (DRFs) are one of the most common fractures affecting pediatric and adult patients, accounting for a major burden of emergency department visits each year in the U.S.1-2. Growing attention to surgical waste highlights its impact on cost and definitions of high-value care.

Aim: This study aims to quantify and compare waste generated from DRF surgery in three different hospital settings, a pediatric trauma center (PTC), an adult trauma center (ATC), and an outpatient ambulatory surgery center (ASC). We hypothesized that differing the location of surgery creates unique waste subtypes related to observed preferences for single-use products when comparing operative site.

Material & Methods: This was a prospective cross-sectional observational study conducted at three discrete hospitals: a pediatric trauma center (PTC), adult trauma center (ATC), and an ambulatory surgical center (ASC). Only isolated DRF surgery was included while polytrauma and complex cases were excluded. The study boundaries were set to collect discarded solid waste in the OR, which was separated into 20 predetermined categories, photographed, and weighed. Total waste was tabulated and compared across hospital sites.

Results: Seventeen cases were audited: 4 at PTC, 3 at ATC, and 10 at the ASC. Operative times were similar across sites, averaging 114.3 minutes at the PTC, 154.3 at the ATC, and 102.6 at the ASC. Total waste was greatest at the ATC (8172.7g), followed by the PTC (7455.0g) and ASC (5634.6g). The largest contributors were plastic (PTC 1213.8g, ATC 2133.7g, ASC 1220.5g), surgical drapes (924.0g, 1419.3g, 1291.6g), and PPE (821.0g, 1169.0g, 793.4g). Pediatric surgeries generated more unused items than adult surgeries (PTC 653.3g, ATC 511.3g vs ASC 173.4g), with unused waste at the PTC being significantly higher than the ASC. The PTC showed the greatest variability in plain paper/cardboard, laminated/wax paper, metal foil, and fabric/fiber.

Conclusions: Despite similar operative times, the pediatric hospital generated significantly more unused waste compared to the ATC (>28%) and ASC (>277%). These findings reflect differences in OR setup, procedure packs, and workflows between hospitals rather than for the procedure itself. Opportunities for waste reduction identified in this study include: refraining from bringing unnecessary items into the OR, sharing procedure protocols and equipment lists, and prioritizing reusable items. Streamlining the above may improve individual and population-based health outcomes while urging the pursuit of greater resource stewardship amongst differing healthcare systems.

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A-0536 WIDE-AWAKE LOCAL ANESTHESIA NO TOURNIQUET (WALANT) FOR RHEUMATOID RECONSTRUCTION: RESTORING FUNCTIONAL BALANCE IN A 16 CASE SERIES

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Introduction: Reconstructive surgery of the rheumatoid hand often involves complex combinations of tendon ruptures, joint destruction, synovitis, and progressive deformity. The active intraoperative motion assessment possible under WALANT is particularly valuable in reconstructive procedures like tendon transfers, soft tissue rebalancing and joint replacements, where functional testing during surgery can guide optimal tensioning and implant positioning by checking tendon tension, active finger extension and flexion, implant alignment, and immediate assessment of functional balance restoration. This is not possible under regional or general anesthesia. The specific role of WALANT surgery in rheumatoid

and inflammatory hand pathology remains insufficiently documented. For these patients, perioperative management is frequently complicated by airway difficulties, cardiovascular risks, and medication interactions. WALANT avoids these systemic anesthetic risks and allows surgeries to be performed safely in an outpatient setting.

Aim: The aim of this study was to assess the feasibility, safety, and functional contribution of WALANT in a consecutive series of patients undergoing reconstructive surgery for rheumatoid hand conditions, including tendon ruptures, synovitis, joint replacements and distal radioulnar joint pathology; focusing on the utility of active intraoperative motion in tendon reconstruction and joint realignment.

Material & Methods: We present a retrospective review of rheumatoid patients undergoing hand reconstruction under WALANT from 2022 to 2025. 16 procedures in 14 patients with rheumatoid arthritis, psoriatic arthritis, HLA-B27-associated disease, or chronic inflammatory arthropathy were included. Procedures comprised extensor tendon reconstruction, transfer or tenodesis, extensor centralization, swan neck deformity correction, flexor tendon reconstruction, metacarpophalangeal joint arthroplasty, joint fusion, distal ulna resection (n=3), and synovectomy of extensor or flexor tendons (n=3). Several patients required combined procedures. The WALANT protocol consisted of local infiltration of lidocaine with epinephrine. Collected variables included intraoperative pain score (0–10), need for anesthetic augmentation, ability to perform active motion and test functional restoration and alignment, complications related to anaesthesia, and patient satisfaction and early functional recovery.

Results: All 15 procedures were completed under WALANT without need for conversion to regional or general anesthesia. Intraoperative pain was minimal, with reported pain score of 0–3 across cases, and no patient required procedure termination or additional sedation. Intraoperative active testing influenced surgical decision-making and enabled adjustment of tendon transfers' tension and suture stability (including transfer or tenodesis corrections), centralization of extensor tendons and verification of implant stability and alignment. This reflects previously reported advantages of WALANT in enabling precise reconstruction through real-time functional assessment. No anesthesia-related complications were recorded. Functional outcomes were favorable in all patients. Patients reported high satisfaction and noted that surgery contributed to confidence with early mobilization due to visual intraoperative feedback.

Conclusions: WALANT is a safe and effective technique that provides real-time intraoperative functional assessment, enables precise tendon tensioning and joint alignment, reduces anesthesia risks, and enhances patient engagement and satisfaction. It can be successfully applied to complex reconstructive and multi-stage procedures, making it a valuable option in the management of rheumatic hand disease.

A-0538 PERSISTENT RADIAL OR MIDCARPAL MALALIGNMENT AFTER CORRECTIVE OSTEOTOMY DOES NOT AFFECT FUNCTIONAL OUTCOME

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Introduction: Malunion is a common complication in distal radial fracture treatment, with a prevalence of 10–23% which may result in pain, limited range of motion and less grip strength. Distal radius malunion accompanied by increased dorsal angulation tends to alter wrist biomechanics, leading to a range of carpal malalignment patterns, which may affect both the radiocarpal (radiolunate) and midcarpal (capitolunate) joints. Previous studies have demonstrated that corrective osteotomy tends to restore normal radiocarpal and midcarpal alignment. However, we observed that radiocarpal and midcarpal malalignment persist in a subset of patients, despite appropriate correction of the malunited distal radius.

Aim: To assess the effects of postoperative persistent carpal malalignment on functional outcomes by comparing the

PRWE of patients with and without persistent radiocarpal or midcarpal malalignment following a corrective osteotomy of the distal radius.

Material & Methods: Radiocarpal malalignment was assessed by determining the 'effective radio-lunate flexion' (ERLF), described by Batra et al. The ERLF represents the relative flexion of the lunate in relation to the articular surface of the distal radius and is calculated by the formula: $\text{ERLF} = \text{dorsal tilt} + 11$ (= average palmar tilt) – radiolunate angle. If the distal radial fracture fragment falls in dorsal direction without effecting the direction of the lunate axis, the ERLF increases. Batra et al. regarded an $\text{ERLF} > 25^\circ$ as radiolunate malalignment. In this study, type 1 malalignment was defined as radiocarpal malalignment ($\text{ERLF} > 25^\circ$) in combination with an aligned capitulunate axis ($0\text{--}20^\circ$ in palmar direction, If the distal radial fracture fragment falls in dorsal direction together with the lunate, the related axes stay more or less aligned ($\text{ERLF} \leq 25^\circ$). In this study, Type 2 malalignment was defined as $\text{ERLF} \leq 25^\circ$ in combination with midcarpal malalignment ($< 0^\circ$ or $> 20^\circ$ in palmar direction. Type 3 malalignment was defined as radiocarpal malalignment ($\text{ERLF} > 25^\circ$) in combination with midcarpal malalignment ($< 0^\circ$ or $> 20^\circ$ in palmar direction. During the standard postoperative follow-up, wrist function was evaluated using the Patient-Rated Wrist Evaluation (PRWE).

Results: Forty-one patients were included. Preoperatively, three patients (7%) met the criteria for Type 1 malalignment, 18 (44%) for Type 2 and three patients (7%) for Type 3 malalignment. Postoperatively, two patients (5%) had Type 1 malalignment, 16 (39%) Type 2 and two patients (5%) had Type 3 malalignment.

All patients reported improved hand and wrist function, with a median improvement of 50 points on the PRWE ($p < 0.001$) after a mean follow up of 14.2 months. The PRWE scores of patients with carpal malalignment did not differ from the patients with normal carpal alignment, both preoperatively and postoperatively.

Conclusions: Midcarpal malalignment is common in distal radius malunions and may even exist simultaneously with radiocarpal malalignment. As all patients in the current study experienced improved function after the corrective osteotomy despite malalignment, we conclude that persistent radial and midcarpal malalignment following a corrective osteotomy does not have an adverse effect on functional outcome as measured by the PRWE.

A-0539 RECONSTRUCTION OF FAILED TRAPEZIECTOMY USING THE PILLOW TECHNIQUE FOR PROXIMAL THUMB MIGRATION

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Introduction: Proximal migration of the thumb is a well-recognized complication following trapeziectomy, either performed alone or in combination with suspension or interposition techniques for the treatment of trapeziometacarpal joint osteoarthritis. This proximal migration is often associated with decreased grip strength, stiffness, pain, and the development of a characteristic Z-deformity of the thumb.

Aim: To address the proximal migration of the thumb following trapeziectomy, we applied the "Pillow Technique" which involves the use of a fascia lata allorraft along with temporary K-wire immobilization and with or without concomitant metacarpophalangeal joint (MCPJ) arthrodesis.

Material & Methods: Three patients with a history of trapeziectomy—performed either alone or in combination with other techniques such as Mini TightRope or hemiresection—were included in the study. All presented with pain, reduced pinch strength, and loss of thumb function due to proximal migration of the first metacarpal.

Proximal migration was defined as the minimum distance between the distal articular surface of the scaphoid and the proximal articular surface of the first metacarpal, as measured on a lateral radiograph.

Outcome measures included grip strength, key pinch, pulp-to-pulp pinch, tripod pinch, active range of motion (AROM), and the Kapandji score. Pain was assessed using the Visual Analog Scale (VAS). All postoperative values were compared with preoperative measurements.

Results: At an average follow-up of one year, all patients regained thumb functionality without pain and demonstrated significant improvements in grip strength and key pinch. The mean VAS score improved postoperatively, and no further surgical revisions were required.

Conclusions: The "Pillow Technique with or without concomitant metacarpophalangeal joint (MCPJ) arthrodesis proves to be an ideal option for the treatment of the proximal migration of the thumb, which offers excellent functional results for a prolonged period.

A-0540 MALROTATION OF EXTRA-ARTICULAR DISTAL RADIAL FRACTURES; COMPARISON OF RADIOGRAPHIC PREDICTION AND CT SCAN MEASUREMENT

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Introduction: Secondary displacement of distal radius fractures (DRF's) after plaster treatment is common, from 20 to 89% within the first year. Rotational displacement of DRF's may contribute to secondary displacement.

Aim: To assess the frequency of axial malrotation of acute extra-articular DRF's and to validate published radiological characteristics.

Material & Methods: In this retrospective study, including 51 extra-articular DRF's, malrotation on radiographs was identified by the characteristics reported by Giddins and Sassi, which are based on a relative mismatch between the distal end of the shaft of the distal radius compared with the proximal end of the distal fracture fragment. As there is no verified method to measure malrotation on CT scans, we used two CT scan measurement methods; one, a new method ('Fracture level method') and the second, a modification of a previously described method (Filer's method).

The 'Fracture level method' starts with determining the direction of rotation of the distal fracture fragment in the sagittal plane. Measured against the radial shaft (proximal) fracture fragment, supination was defined as greater volar translation of the ulnar side of the distal radius fracture fragment relative to the radial side or greater dorsal translation of the radial side of the distal radius fracture fragment compared to the ulnar side. Pronation was defined as greater dorsal translation of the ulnar side of the distal radius fracture fragment relative to the radial side or greater volar translation of the radial side compared to the ulnar side. Second, the extent of malrotation was assessed by measuring the angle between two lines; one parallel to the volar cortex of the distal shaft (proximal fracture fragment) and one parallel to the volar cortex of the distal fracture fragment.

The method of Filer et al. assesses rotation by determining the difference between a distal and proximal angle. The distal angle was measured on the first axial plane proximal to the radio-carpal joint, between two lines; one between the midpoint of the sigmoid notch and the most radial cortex of the distal radius, and a second, which was a horizontal 'reference line'. The measurement of the proximal angle was performed on the first more proximal axial image that included the flat part of the volar surface of the radial shaft. This angle was measured between two lines; one line parallel to the flattened volar cortical surface of the radius, and a second horizontal 'reference line'. Malrotation was defined as >5° difference.

Results: Using the malrotation characteristics on radiographs, malrotation was predicted in 28 wrists, including the 18 malrotated wrists based (35%) on the Fracture level method (sensitivity = 100%). With the method of Filer et al, 21

wrists (41%) were malrotated, of which 11 were classified as malrotated based on the radiographs (sensitivity = 52%). Conclusions: Residual fracture malrotation following DRF reduction is common with a prevalence of 35–40%. The ability to predict this malrotation with a 100% sensitivity using Giddins' malrotation characteristics, suggest that these characteristics may be helpful for recognition of malrotation on radiographs.

A-0541 IMMEDIATE FUNCTIONAL RECONSTRUCTION OF THE HAND AND UPPER LIMB AFTER ONCOLOGIC RESECTION: A TWO-CASE EXPERIENCE

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Introduction: Limb-salvage surgery combined with neoadjuvant or adjuvant therapies is the standard of care for upper-limb malignancies. Tumors affecting the hand present unique reconstructive challenges, as wide resection often requires removal of structures critical for function, including nerves and musculo-tendinous units. Immediate functional reconstruction at the time of tumor excision is desirable to preserve limb function, provided oncologic radicality is maintained and local tissue conditions—often compromised by radiotherapy—permit it.

Aim: To report our experience with single-stage functional reconstruction of the hand and upper limb following oncologic resection, evaluating flap survival, functional outcomes, and postoperative complications.

Material & Methods: Two patients undergoing upper-limb tumor resection were treated with immediate reconstruction using free or pedicled flaps. When indicated, adjunctive procedures such as tendon transfers or nerve reconstruction were performed. Clinical evaluation included flap viability, postoperative complications, and functional recovery. All cases were managed by a multidisciplinary team including oncologic, reconstructive, and rehabilitation specialists.

Results: Both patients achieved satisfactory functional outcomes with successful flap survival. Single-stage reconstruction demonstrated a low rate of postoperative complications. The multidisciplinary approach was essential to minimize local complications (vascular failure, wound dehiscence, infection), prevent recurrence, and facilitate early functional restoration. **Conclusions:** A wide range of free and pedicled flaps is available for functional reconstruction of the hand and upper limb after oncologic resection. Flap selection should consider defect size and characteristics, tissues to be replaced, functional goals, and surgeon expertise. Immediate reconstruction within a multidisciplinary framework can provide stable coverage and meaningful functional recovery, while maintaining oncologic safety.

A-0542 OPTIMAL MANAGEMENT OF PYOGENIC FLEXOR TENOSYNOVITIS OF THE HAND: A COHORT STUDY

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Introduction: Pyogenic flexor tenosynovitis (PFT) is a common hand infection associated with significant morbidity. Management varies due to lack of evidence-based guidelines, typically involving surgery and antibiotics. The importance of balance in the management of PFT is clear - balancing complete resolution of infection with preserving hand function and preventing post-operative stiffness and other complications.

Aim: We conducted a cohort study comparing outcomes between open and minimally invasive surgical techniques, aiming to identify the optimal management of PFT.

Material & Methods: Retrospective data collection of patients who underwent surgery for PFT in a single tertiary plastic surgery unit between 21 August 2013 and 4 October 2023 was undertaken. Demographics, injury mechanism, operative details and antibiotic use were recorded. Cases involving cellulitis or osteomyelitis were excluded. Outcomes included length of stay, length of follow-up and post-operative complications.

Results: A total of 338 patients (mean age 47.2 years [SD 18.4]) were included. PFT most commonly resulted from animal bites (27.6% of cases). Open surgery was performed in 121 cases, whilst 53 underwent minimally invasive procedures; type of surgery was not documented for the remaining cases. Intra-operative cultures were positive in 188 cases, with *Staphylococcus aureus* identified in 73. Antibiotics were administered for a mean duration of 9.04 days [SD 6.12], with co-amoxiclav used in 250 cases. Patients were followed up for an average of 6.75 weeks [SD 14.3], with 69 experiencing ongoing post-operative stiffness. No statistically significant differences in outcomes were observed between open and minimally invasive surgery.

Conclusions: There is no evidence in favour of open or minimally invasive techniques for PFT outcomes, and antibiotic prescribing varies widely. Standardised, evidence-based management guidelines are needed, with future multi-centre studies required to compare interventions, prevent ineffective operations that may increase morbidity, and improve patient outcomes.

A-0543 RADIAL SHAFT FRACTURE WITH IPSILATERAL RADIAL HEAD DISLOCATION: A CASE REPORT

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Introduction: We present a case of radial head dislocation combined with an ipsilateral radial shaft fracture, presented in an adult patient after a motor vehicle accident. This represents a rare fracture pattern, with few cases described in the existing literature

Aim: The aim of this presentation is to describe a rare forearm fracture pattern that, unlike Galeazzi and Monteggia fractures, has not yet received a formal name and specific treatment guidelines. Greater study and potential formal naming may be warranted to prevent misdiagnosis and ensure prompt recognition.

Material & Methods: A 39 year old patient of no significant medical history presented at the ER after a motor vehicle accident. Radiographs showed a right radial diaphyseal fracture and an ipsilateral radial head dislocation, with no other associated significant injuries. An above elbow cast was applied at initial management and surgical treatment of the fracture was planned. An open reduction and osteosynthesis of the fracture was performed using a limited contact dynamic compression plate through an expanded Henry approach to the radius and the radial head dislocation was reduced through a Kocher approach together with capsular and lateral collateral ligament repair with the use of an anchor.

Results: The postoperative course was uneventful. A long arm cast in neutral position and 90 degrees of flexion was applied for 4 weeks and then gentle range of motion exercises were commenced. At the 6-month follow-up, the patient presented full range of motion and elbow stability without any residual pain.

Conclusions: Radial head dislocations occur usually in Monteggia type fractures, combined with ulnar shaft fractures. There are only a few cases of radial head dislocation with ipsilateral radial shaft fracture documented in the literature. The underlying mechanism of this fracture remains a matter of debate in the literature. In our case, it was a fall on an

outstretched hand combined with rotational forces. Because of the rarity of this fracture pattern, there are no specific treatment guidelines. This case report highlights the importance of careful clinical and radiological examination of both proximal and distal joints to avoid misdiagnosis of infrequent fracture patterns.

A-0544 REHABILITATION TECHNIQUES EFFECTIVE IN IMPROVING FUNCTIONALITY OF THE AFFECTED UPPER LIMB IN CHILDREN WITH OBSTETRIC BRACHIAL PLEXUS PALSY: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Introduction: Obstetric brachial plexus palsy (OBPP) is a common neonatal injury that can lead to significant physical and psychological consequences for the child. It causes structural deficits of the affected upper limb due to muscle weakness and imbalance, resulting in limitations in activities of daily living and restrictions in social participation. Although conservative rehabilitation techniques are the most commonly used interventions to restore neuromuscular balance in OBPP, only a limited number of studies have evaluated their efficacy and the search for the most effective approach is still ongoing.

Aim: This study aimed to identify rehabilitation techniques effective in improving the functionality of the affected upper limb in children diagnosed with OBPP.

Material & Methods: This systematic review of the literature was conducted in accordance with PRISMA guidelines. Articles published between 2013 and 2023 were searched in PubMed, PEDro, Scopus and the Cochrane Library databases. The PICOS framework was used to define the inclusion criteria: Population — children under 18 years of age diagnosed with OBPP; Intervention — rehabilitation techniques used either in addition to or as alternatives to conventional therapy; Comparison — conventional therapy or other rehabilitation techniques; Outcome — functionality of the affected upper limb; Study design — randomized controlled trials (RCTs). The risk of bias in the included studies was assessed using the PEDro scale.

Results: Fourteen RCTs met the inclusion criteria. Their findings suggest that exercise, neuromuscular electrical stimulation, constraint-induced movement therapy, mirror therapy, therapeutic taping, splinting and virtual reality are effective in improving the function of the affected upper limb in children with OBPP. Significant intra- and inter-group differences ($p < 0.05$) were reported for the main outcomes assessed: range of motion, muscle strength and functional activity of the affected upper limb.

Conclusions: This systematic review highlights innovative rehabilitation techniques that can serve as valuable adjuncts to conventional physiotherapy for enhancing functional recovery and restoring neuromuscular balance in children with OBPP. Further research is warranted to confirm these findings and to fully understand the potential of these physiotherapeutic approaches. Future RCTs should include larger sample sizes, evaluate long-term effects, consider other clinically relevant outcomes and differentiate results based on the type of paralysis and treatment characteristics.

A-0545 THE FIRST DORSAL METACARPAL ARTERY (FDMA) PROPELLER PERFORATOR FLAP FOR FIRST WEB SPACE RECONSTRUCTION

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Introduction: Reconstruction of the first web space following trauma or contracture release remains challenging due to the need for thin healthy tissue and preservation of hand function. The first dorsal metacarpal artery (FDMA) propeller perforator flap provides well-vascularized and appropriately contoured tissue for coverage in this region.

Aim: To describe a novel case of first web space reconstruction using an FDMA propeller perforator flap.

Material & Methods: A 28-year-old male presented with post-traumatic scarring and contracture of the first web space following an injury to the left hand that resulted in partial amputation of the thumb and complete amputation of the index finger. During preoperative planning, the FDMA perforator was localized using a handheld Doppler, and flap markings were made accordingly (Figure 1).

The flap was elevated from proximal to distal in the subfascial plane under loupe magnification ($\times 3.5$) and tourniquet control (240 mmHg). It was based on a perforator arising from the FDMA, while the sensory nerve branch to the index finger from the superficial branch of the radial nerve was ligated. The first web space was released, and fibrotic tissue was excised. The flap was rotated 180° around the perforator and inset into the first web space. The donor site was closed primarily, and the hand was immobilized in a splint.

Results: Partial superficial skin necrosis was noted at the first follow-up and managed conservatively (Figure 2).

No major complications occurred. After recovery and rehabilitation, the remaining thumb demonstrated significant improvement in mobility and function (Figure 3).

Conclusions: To the best of our knowledge, this represents the first reported case of successful first web space reconstruction using an FDMA propeller perforator flap.

A-0546 SITE OF INSERTION OF FLEXOR DIGITORUM PROFUNDUS TENDON AND VOLAR PLATE AT THE DISTAL PHALANX IN RELATION TO A VOLAR SPUR - DO BONY VOLAR PLATE AVULSIONS EXIST IN THE DIP JOINT?

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Introduction: Until now, bony avulsions at the base of the distal phalanx are solely ascribed to avulsions of the flexor digitorum profundus (FDP) tendon.

Aim: We aimed to differentiate between the attachment sites of the volar plate and the FDP tendon by specific measurements in lateral radiographs. Furthermore, their relation to a volar spur was assessed.

In a second step we aimed to screen for patients with a bony volar plate avulsion of the DIP joint and subsequently assess the clinical outcome in a follow-up study.

Material & Methods: We dissected the attachments of the volar plate and the FDP tendon in 200 distal phalanges of male and female body donors. The margins of the attachments were marked with cannulas for subsequent radiological evaluation. The location of a not yet described volar spur at the base of the distal phalanx was assessed hypothesizing a potential correlation to the FDP tendon attachment.

Afterwards, we reviewed radiographs of patients of the last 10 years with an avulsion or fracture of the distal phalanx applying our criteria for diagnosing a bony volar plate avulsion in the DIP joint. We identified 64 patients with such an injury and were able to conduct a follow up examination on 15 patients.

Results: The analyzed phalanges were 16.8 ± 1.5 mm long and 5.6 ± 0.7 mm deep. The volar spur was identifiable in all specimens and was located 3.5 ± 0.6 mm from the volar articular line. The distances from the articular line to the volar spur and to the proximal margin of the FDP tendon showed strong correlation (0.560 , $p < 0.001$). The proximal margin of the FDP tendon attachment was located at $47.4 \% \pm 10.6 \%$ of the distance

between the articular line and the volar spur.

We performed a follow up examination on 4 female and 11 male patients. Their mean age at time of trauma was 40.4 ± 15.1 years. The mean trauma mechanism was an hyperextension injury. Mean time to follow up was 73 months. At time of follow up the Range of Motion in the formerly injured finger was $68.6^\circ \pm 10.5^\circ$, compared to $82.1^\circ \pm 9.9^\circ$ of the contralateral healthy finger. The mean DASH score was 8.4 ± 9.3 .

Conclusions: The volar spur at the volar base of the distal phalanx facilitates the identification of the FDP tendon attachment and its differentiation from the volar plate attachment. This may be essential in the characterization of bony volar plate avulsion in the distal phalanx. Furthermore, the volar spur may serve intraoperatively as radiological reference of the centroid of the FDP tendon attachment facilitating correct repair placement in FDP tendon avulsions.

Bony volar plate avulsions in the DIP joint can be encountered clinically and moreover diagnosed in lateral radiographs. Functional and patient reported outcome measurements show balanced long term outcomes

A-0547 ULTRASOUND-GUIDED MINI-INVASIVE TECHNIQUE VERSUS TRADITIONAL OPEN TECHNIQUE IN CARPAL TUNNEL SYNDROME: A PROSPECTIVE RANDOMIZED CONTROLLED STUDY

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Introduction: Carpal tunnel syndrome is a common entrapment neuropathy in which increased pressure within the carpal canal impairs median nerve function. Traditional open release is effective but mini-invasive ultrasound-guided neurolysis has been developed to minimize iatrogenic trauma and potentially promote a faster re-establishment of hand functional dynamics. A head-to-head randomized comparison between these two approaches can clarify differences in pain, functional recovery, strength restoration and symptom resolution.

Aim: The aim of this study was to evaluate whether the ultrasound-guided mini-invasive technique facilitates a faster postoperative recovery compared to traditional open neurolysis in patients with carpal tunnel syndrome, using validated clinical scales and strength measurements; secondary aims included assessing potential differences in the incidence of complications and recurrence.

Materials and Methods: A prospective randomized controlled study was performed on working-age adults (18-65 years) diagnosed with primary carpal tunnel syndrome meeting clinical and neurophysiological inclusion criteria. Participants were randomly assigned to ultrasound-guided mini-invasive median nerve neurolysis or traditional open release. Follow-up assessments were conducted preoperatively and at 2 weeks, 1 month, 3 months, and 6 months. Outcome measures included the Disabilities of the Arm, Shoulder and Hand (DASH) score, the CTS-6 symptom questionnaire, grip strength, Visual Analogue Scale (VAS) for pain, Palmar Pain Scale (PPS), cross-sectional area (CSA) of the median nerve and postoperative analgesic consumption.

Results: Despite ongoing recruitment, preliminary analyses on approximately 100 participants show significant

improvement in both groups, with distinct recovery trajectories. The mini-invasive group demonstrated a more rapid and consistent postoperative recovery. At 2 weeks, pain levels (VAS) decreased markedly in both groups, but at 1 month, the difference became clinically relevant, with VAS remaining substantially higher in the open group. Scar-related discomfort, measured by PPS, was significantly lower at all postoperative stages in the mini-invasive group, with faster resolution and fewer persistent symptoms at 3 and 6 months. Functional outcomes followed the same pattern: DASH scores improved earlier and more consistently in the mini-invasive group, reflecting a quicker normalization of hand use in daily activities. Grip strength recovered faster and exceeded baseline values at 3 months in the mini-invasive group. CTS-6 scores showed earlier symptom resolution in the mini-invasive cohort. A trend toward a slightly reduced CSA after surgery (approximately –6–9%) was observed across follow-up evaluations, with high individual variability and no statistical significance. Postoperative analgesic use further supported these findings: a lower percentage of patients in the mini-invasive group required analgesics in the immediate postoperative period compared with the open group, in which some patients continued to use these medications for a longer period.

Conclusion: Overall, ultrasound-guided mini-invasive neurolysis provides faster postoperative recovery, with earlier reduction in pain and scar tenderness, quicker improvement in functional scores and a more rapid restoration of grip strength compared with open release. Both techniques were effective, but the mini-invasive approach resulted in better early patient comfort and more efficient functional recovery.

A-0548 COMPARATIVE PROFILING OF THUMB JOINT POSITION SENSE AND PINCH-APERTURE CONTROL ACROSS TRAPEZIOMETACARPAL OSTEOARTHRITIS STAGES

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Introduction: Thumb proprioception plays a crucial role in the coordination of fine motor skills and precision movements of the hand. This finely tuned sensory system can be compromised in trapeziometacarpal (TMC) osteoarthritis (OA) due to degenerative changes in periarticular tissues—particularly those affecting ligamentous innervation and mechanoreceptor distribution. Such disruptions in joint-level proprioception may propagate distally, as thumb function relies on the coordinated movement of multiple joints, ultimately impairing overall thumb sensorimotor control, particularly during task-level movements such as graded pinch-aperture control. Evaluating both joint-level and task-level proprioception thus offers a comprehensive framework for understanding sensorimotor degradation across TMC OA stages.

Aim: This study aimed to comparatively evaluate joint position sense accuracy at the TMC, MCP, and IP joints and task-level proprioceptive control during pinch-aperture movement among healthy individuals and patients with early and late stages of trapeziometacarpal osteoarthritis.

Material & Methods: This cross-sectional analysis included 77 participants: healthy controls (n=27), early TMC OA (Eaton 1–2, n=20) and late TMC OA (Eaton 3–4, n=30). Proprioception was assessed by an angle-reproduction test and expressed as error in degrees. For the TMC joint, targets were 40°, 30° and 20° abduction. For distal joints, MCP 20° flexion and IP 20° flexion were tested. Task-level proprioception was evaluated with a pinch-aperture device as the absolute error during programmed transitions from 30° to 15° and from 15° to 30°. Group differences (Healthy vs Early vs Late) were tested with Kruskal–Wallis' test. Statistical analyses were performed using R (R Foundation for Statistical Computing, Vienna, Austria). **Results:** All proprioceptive measures showed significant stage-related differences. TMC joint position sense at 40° abduction

differed across the three groups (Kruskal–Wallis $\chi^2=41.095$, $df=2$, $p=1.19\times10^{-9}$), with medians of 0.3° (healthy), 2.0° (early) and 3.0° (late). A similar but even steeper pattern was observed distally: MCP 20° flexion error differed significantly ($\chi^2=32.764$, $df=2$, $p=7.68\times10^{-8}$), increasing from 1.3° (healthy) to 2.3° (early) and 5.0° (late); IP 20° flexion error also differed ($\chi^2=37.174$, $df=2$, $p=8.47\times10^{-9}$) and showed the largest deterioration, rising from 1.3° to 3.15° and 7.6° in healthy, early and late groups, respectively. Task-level aperture control was likewise stage-sensitive: Pinch aperture proprioception from 30° to 15° increased from 1.3° (healthy) to 2.65° (early) and 4.3° (late) ($\chi^2=28.729$, $df=2$, $p=5.78\times10^{-7}$). Visual inspection of medians indicated a consistent ordering (healthy < early < late) for all variables.

Conclusions: Thumb proprioception in TMC osteoarthritis is not only impaired but progressively impaired with disease stage, and this progression is more marked at distal joints and during aperture-closing tasks. The finding that MCP and especially IP proprioceptive error rose more than TMC in late disease indicates a segmental, thumb-ray involvement rather than an isolated TMC deficit. The significant deterioration of pinch aperture proprioception further shows that functionally relevant, graded pinching is proprioceptively vulnerable in TMC OA. These results justify integrating joint-specific and task-specific proprioceptive assessment into the routine functional evaluation of TMC OA.

A-0549 WHO DEVELOPS POOR GRASP IN TRAPEZIOMETACARPAL OSTEOARTHRITIS?

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Introduction: Trapeziometacarpal (TMC) osteoarthritis commonly compromises grasp because the thumb is central to force closure and precision handling. However, most studies focus on region-specific disability or isolated pinch measurements, and determinants of real-life grasp performance remain insufficiently characterized.

Aim: To identify factors associated with poor grasp performance in individuals with TMC osteoarthritis, using multivariable Firth penalized logistic regression as the primary analytic approach.

Material & Methods: Fifty-eight individuals with TMC osteoarthritis (mean age 57.2 ± 13.5 years) were evaluated cross-sectionally. Grasp function was assessed using the Moineau et al. instrument, which rates five everyday grip types—power, key, pinch grasp, spherical and precision—through functional tasks scored 0–4 (total 0–20). In line with the original description, scores $\leq 16/20$ indicated average/poor hand function and were used to dichotomize participants into good versus poor grasp groups. Candidate determinants comprised age, sex, body mass index (BMI), pain at rest and during activity (visual analogue scale), TMC abduction/flexion, metacarpophalangeal and interphalangeal flexion, grip and lateral/tripod/palmar pinch strengths, disability (QuickDASH, Thumb Disability Index [TDXI]), kinesiophobia (Tampa Scale), adductor spasm and hypermobility. Continuous variables were compared with Mann–Whitney tests, reporting Hodges–Lehmann median differences and Cliff's delta with 95% confidence intervals; Benjamini–Hochberg false discovery rate correction was applied across all univariable tests. Categorical variables were analyzed with Fisher's exact test (false discovery rate—adjusted). The primary multivariable analysis was a Firth penalized logistic regression with grasp status as the outcome and age, sex, BMI, activity-related pain, lateral pinch strength, TMC and metacarpophalangeal flexion, QuickDASH, Tampa score, adductor spasm and hypermobility as predictors. Model performance was summarized with the likelihood-ratio test, Tjur R^2 and the Brier score.

Results: Forty-six participants (79%) were classified as having poor grasp and 12 (21%) as having good grasp. In univariable analyses with Benjamini–Hochberg correction, poorer grasp was associated with higher age (Hodges–Lehmann difference

–17 years; Cliff's δ –0.61), greater disability (QuickDASH difference –22 points; δ –0.55; TDX difference –14 points; δ –0.52), higher kinesiophobia (Tampa difference –7 points; δ –0.57), lower lateral pinch strength (difference +1.5 kg favoring good grasp; δ 0.52) and smaller interphalangeal flexion (difference +10° favoring good grasp; δ 0.50). Tripod and palmar pinch strengths, BMI, pain scores and hypermobility indices were not significant after multiplicity adjustment. In the multivariable Firth model, only age retained an independent association with poor grasp (odds ratio 1.12 per year; 95% confidence interval 1.01–1.44; $p = 0.037$). Overall model fit was supported (likelihood-ratio $\chi^2 = 24.1$ on 13 degrees of freedom; $p = 0.030$), with acceptable discrimination and calibration (Tjur $R^2 = 0.526$; Brier score = 0.064).

Conclusions: In TMC osteoarthritis, patients who are older, more disabled, more fearful of movement, weaker in lateral pinch and who have reduced interphalangeal flexion are substantially more likely to exhibit poor grasp; however, only age remains independently associated in multivariable analysis. Grasp impairment in TMC osteoarthritis therefore appears as an age-accentuated, multidimensional problem in which behavioral and performance-based factors cluster with, rather than replace, the influence of chronological ageing.

A-0550 SENSORY PHENOTYPE OF TRAPEZIOMETACARPAL OSTEOARTHRITIS: PREVALENCE, STAGE DISTRIBUTION AND INDEPENDENCE FROM CHRONOLOGICAL AGE

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Introduction: Trapeziometacarpal (TMC) Osteoarthritis (OA) is characterized by pain, capsuloligamentous laxity and motor insufficiency; however, patients often display imprecise pinch, indicating a somatosensory component.

Aim: We aimed to (i) define the prevalence of cutaneous sensory impairment across radial, median and ulnar territories using Semmes–Weinstein Monofilament (SWM) protocol; (ii) determine whether sensory involvement accumulates from early (Eaton 1–2) to late (3–4) disease; (iii) test whether loss of sensibility is attributable to aging or to the osteoarthritic condition itself; and (iv) extend the sensory profile with vibration sense and Moberg functional sensibility.

Material & Methods: Fifty consecutive patients with TMC OA were evaluated. SWM was applied once to representative radial, median and ulnar sites using ten trials (≥ 7 correct) and scored on the original 6→0 scale (1.65–2.83 g = normal light touch; ≥ 3.22 g = diminished or worse). Sensory loss was defined as SWM ≥ 3.22 g. Patients were classified as early (1–2) or late (3–4). Stage comparisons were performed using Fisher's exact test due to small cell counts. To disentangle disease from age, all OA patients ($n=50$) were pooled with healthy controls ($n=27$) and a Firth logistic regression was fitted with median-territory loss as the outcome and group and age as covariates. In the OA cohort, vibration sense and Moberg pick-up time were dichotomised at the sample median, and a multimodal "sensory burden" variable (0–3 abnormalities: SWM-any, vibration, Moberg) was created. Analyses were performed in R.

Results: Cutaneous sensory loss was detected in 48 of 50 patients (96%) across radial, median, and ulnar territories. Early disease showed very high but incomplete involvement (18/20; 90%), whereas late disease showed universal involvement (30/30; 100%); early–late differences were non-significant on Fisher testing ($p=0.155$), indicating a ceiling effect. Firth logistic regression within OA showed only a trend for greater median-territory loss in late disease (coef 2.11; $p=0.115$). In the age-adjusted model including healthy controls, both TMC OA status (coef 7.69; $p=4.1 \times 10^{-11}$) and age (coef 0.20 per year; $p=2.6 \times 10^{-7}$) independently predicted sensory loss, confirming that the deficit is not age-related. Adding vibration and Moberg testing revealed a broader but still sensory-heavy phenotype: in early disease, vibration was impaired in

60% and Moberg in 50%; in late disease, vibration was impaired in 43.3% and Moberg again in 50%. The proportion of patients with ≥ 2 impaired modalities rose only modestly from 65% (early) to 70% (late). Multimodal sensory burden did not correlate with QuickDASH ($p = 0.036$; $p = 0.806$) or TDX ($p = -0.140$; $p = 0.331$), consistent with sensory ceiling and the contribution of non-sensory determinants of function.

Conclusions: A single-site SWM protocol reveals a near-universal sensory deficit in TMC OA ($\approx 96\%$), and age-adjusted modelling shows this deficit is disease-intrinsic. Adding vibration and Moberg testing shows that about one half of patients also exhibit deeper or task-level sensory compromise, but this additional sensory load is not linearly reflected in disability scores because of ceiling and mixed pain–motor influences. These findings support routine sensory testing and argue for rehabilitation addressing sensory, motor, and pain components.

A-0551 A 30-YEAR FOLLOW-UP USING DYNADESIS TO TREAT CHRONIC DYNAMIC SCAPHOLUNATE INSTABILITY
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Introduction: Treating wrist ligament injuries is often challenging. In chronic dynamic scapholunate instability (CDSI), the scapholunate interosseous ligament (SLIL) is weakened, causing applied loads to flex and pronate the scaphoid. This increases the leverage of the extensor carpi radialis longus (ECRL) and flexor carpi radialis (FCR) tendons, which then deform the scaphoid further. Over time, accessory scaphoid ligaments stretch, worsening instability with load. Some believe this progression may lead to severe wrist joint arthritis.

Aim: To determine whether patients with CDSI can attain a long-term, pain-free, functional wrist through antagonist tendon transfers (Dynadesis). This approach aims to reduce deforming forces and reinforce the volar accessory scaphoid ligaments, thereby avoiding procedures involving soft or bony tissue that limit wrist motion.

Material & Methods: Dynadesis involves transferring the ECRL tendon through a tunnel in the reduced distal scaphoid to its antagonist muscle, FCR, using a tension-locking mechanism. The part of the FCR distal to the scaphoid is tethered and tightens during co-contraction of the ECRL and FCR muscles, acting as an active checkrein to support the accessory scaphoid ligaments, resist scaphoid flexion, and reduce the FCR's moment arm. This setup counters deforming forces on the scaphoid without restricting its motion. When the SLIL is torn, mechanoreceptor impulses decrease, altering stabilization responses. However, in Dynadesis, the decreased impulses are compensated for because scaphoid movement directly stimulates the ECRL, activating the construct. The construct is triggered when the wrist is loaded and relaxes when unloaded. Twenty-one patients treated with Dynadesis were followed for an average of 30 years (range: 25–33) and evaluated through x-rays, grip, pinch, and range of motion tests. The average age at final follow-up was 70 years.

Results: Thirty years after Dynadesis (range 23–33 years), patients demonstrated an average grip strength of 31kg, key pinch of 7.3 kg, active wrist flexion of 68 degrees, and active extension of 54 degrees. X-rays revealed normal age-related changes without signs of radio-scaphoid arthritis. Functional outcomes, measured by the Mayo Wrist Score, averaged 92, with 16 rated excellent, 4 good, and 1 satisfactory. On a 1–10 visual analogue scale, 95% of patients reported no pain. All patients expressed satisfaction with their outcomes and would recommend the procedure.

Conclusions: This is the longest follow-up report specifically for treatment of CDSI. Dynadesis is a dynamic solution for a dynamic instability. A 30-year follow-up suggests it avoids the eventual complication of osteoarthritis while maintaining wrist mobility. The goal of Dynadesis is not to reconstruct the torn SLIL but to support the scaphoid and its secondary stabilizers, preventing deterioration and progression to a static scapholunate instability. Unlike ligament reconstructions,

the construct does not loosen over time because the ECRL and FCR muscles co-contract, tightening the construct whenever the wrist is loaded. With appropriate patient selection, based on clinical staging and arthroscopic findings, Dynadesis offers a compelling long-term solution for those with chronic dynamic scapholunate instability.

A-0552 ULTRASOUND-GUIDED CARPAL TUNNEL RELEASE: CLINICAL OUTCOMES AND FUNCTIONAL RECOVERY IN A MULTICENTER COHORT OF 735 PATIENTS

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Introduction: Carpal tunnel syndrome (CTS) impairs sensory and motor function of the hand, often leading to pain, paresthesia, and reduced dexterity. Loss of coordinated median nerve function can affect fine motor control and overall hand performance. Open carpal tunnel release remains a reliable treatment, but postoperative discomfort and longer recovery have encouraged the adoption of less invasive options. Ultrasound-guided carpal tunnel release (UGCTR) offers real-time visualization, targeted decompression, and minimal soft-tissue disruption, potentially supporting faster recovery and earlier re-establishment of normal hand function. Large-scale clinical data, however, are still limited.

Aim: The aim of this study was to evaluate pain reduction, symptom and functional improvement, structural changes of the median nerve, complication rates, and recovery timelines after UGCTR in a multicenter Italian cohort, with particular attention to the early restoration of hand function.

Materials and Methods: This retrospective observational study included patients undergoing UGCTR between 2012 and 2025 across multiple Italian hand surgery centers. Inclusion criteria were clinically and electrodiagnostically confirmed CTS unresponsive to conservative treatment. Exclusion criteria included recurrent lesions and secondary causes of compression. All procedures were performed under WALANT anesthesia using one of three validated approaches (Kemir H3 knife, McShane needle release, or Brando technique). Pain (VAS), symptom and function scores (BCTQ), return to daily activities (RDA), return to work (RTW), complication rates, and median nerve cross-sectional area (CSA) were recorded preoperatively and at 1, 4, and 12 weeks. Standard nonparametric statistics were applied.

Results: A total of 735 patients were included. Pain improved rapidly, with VAS scores decreasing from 6.37 preoperatively to 2.20 at 1 week, 1.20 at 4 weeks, and 0.58 at 12 weeks. Both BCTQ scales showed significant improvement by week 1, indicating early functional gains and recovery of hand performance. Median nerve CSA decreased significantly from 12.81 mm² to 8.83 mm² at 4 weeks, reflecting effective decompression.

Functional recovery was rapid: mean RDA was 5.7 days, while mean RTW was 14.5 days. Patients without early complications demonstrated faster return to daily activities, although differences in RTW were not statistically significant.

Complications were infrequent and mostly mild, decreasing from 8.7 percent at week 1 to 3.4 percent at week 12. Local tenderness and residual symptoms were the most common findings; less frequent events consisted of minor hematomas, brief sensory disturbances, one superficial infection, one case of trigger finger, and a single motor branch lesion. Most postoperative symptoms resolved spontaneously during follow-up.

Conclusion: UGCTR provided rapid pain relief, significant early improvement in symptoms and function, and low complication rates in a large patient cohort. The minimally invasive nature of the procedure supports efficient postoperative

recovery with early return to daily and occupational activities. These findings reinforce UGCTR as a safe and effective alternative to open surgery and highlight the value of ultrasound guidance in achieving precise decompression while preserving normal hand mechanics. Further prospective comparative studies are warranted to confirm long-term durability and refine indications.

A-0553 THE ROLE OF PREOPERATIVE ANTIBIOTICS IN OSTEOSYNTHESIS OF THE HAND AND WRIST: A RETROSPECTIVE ANALYSIS

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Introduction: Preventing postoperative infections in hand surgery is an important factor for achieving sustainable results of surgical procedures. To prevent infections, especially when implants are used, preoperative prophylactic antibiotics are applied in adherence to predominantly national guidelines, which are not specifically tailored to hand surgery. However, several studies related to elective soft tissue hand surgery indicate that the preoperative use of antibiotics does not reduce the incidence of postoperative infections (Bykowski et al., 2011; Li et al., 2018; Shapiro et al., 2019). Evidence regarding their efficacy in osteosynthesis of the hand and wrist remains limited.

Aim: Investigate whether preoperative antibiotic prophylaxis is necessary for hand trauma surgery including implants.

Methods: In this retrospective study, we analyzed 542 adult patients who underwent hand or wrist osteosynthesis between 2016 and 2019 at our university center. They were enrolled into an antibiotic treatment group and a control group without antibiotic treatment. The prophylaxis group (P) underwent surgery in the main operating theatre under intravenous, whereas the non-prophylaxis group (NP) was treated under WALANT (Wide Awake Local Anaesthetic No Tourniquet) in an outpatient operating theatre without receiving preoperative antibiotics. Theatre construction and installation were otherwise similar, and both classified as grade 1 theatres. We applied propensity modeling and inverse probability of treatment weighting (IPTW) to achieve balanced treatment groups with respect to risk factors for infection, and we calculated the odds ratio of prophylaxis and infection. Inclusion factors for risk of infection were age, female sex, smoking, diabetes, metabolic disease, inflammatory disease, substance abuse, cardiovascular disease, hepatopathy, renal disease, polytrauma, open fracture, being a manual worker, and occupational accidents. To assess the severity of the cases, we considered whether the fractures were intraarticular, multi-fragmentary, or open, and we collected data on the types of surgical implants that were used.

Results: No significant association was found between antibiotic prophylaxis and postoperative infection rate (infection rate P: 3.86%; NP: 3.27%; unadjusted OR: 1.19; adjusted OR after IPTW: 1.09). In terms of risk factors, there was an insignificant trend of higher infection rates in the subgroups smoking, cardiovascular disease, open fracture, occupational accident, and open fixations.

Conclusion: In this cohort, routine use of preoperative antibiotics in hand osteosynthesis did not reduce infection rates. The effectiveness of the widespread standardized application of prophylactic antibiotics to reduce the risk of postoperative infections in osteosynthesis of the hand and wrist remains debatable. Surgeons need to balance risk of infection against the organisational hazard of administering a perioperative antibiotic prophylaxis in a time where WALANT is more often the standard of care due to lacking resources and cost to treat hand surgical trauma cases.

A-0554 HOME EXERCISE PROGRAMS IN PEDIATRIC FLEXOR TENDON REHABILITATION: FROM DEVELOPMENT TO INTERPROFESSIONAL IMPLEMENTATION

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Introduction: Flexor tendons are central to hand function and essential for children's (not only) motor development. Although childhood flexor tendon injuries are rare, inadequate treatment can lead to long-term functional and developmental consequences. Current literature emphasizes age and suture technique as key determinants for postoperative management; however, psychosocial and environmental factors, particularly parental involvement, are equally critical for successful rehabilitation. Up to date, no standardized postoperative protocol for children (0–12 years) exists. To address this gap, an interprofessional team at the University Hospital of Plastic, Reconstructive and Aesthetic Surgery in Innsbruck developed a new, age-adapted occupational therapy aftercare regime, including structured, child-friendly home exercise programs to actively involve parents. This approach supports restoring balance between person, environment, and occupation, reflecting the PEO model, a foundational framework in occupational therapy.

Aim: This presentation aims to outline the interprofessional development of home exercise programs - a practice-based project within the Master's Programme in Occupational Therapy and Occupational Science at the Health University of Applied Sciences Tyrol - and the subsequent master's thesis of the first author, investigating the implementation of this postoperative regime.

The focus is on identifying key elements that influence collaboration and on examining the facilitators and barriers that shape these processes, with the aim of deriving practical implications for quality development in pediatric hand therapy. **Material & Methods:** An exploratory sequential mixed-methods design was applied. First, a quantitative online survey was sent to all physicians and occupational therapists at the University Hospital Innsbruck to assess acceptance, practicality, and feasibility of the new regime. Subsequently, semi-structured expert interviews are being conducted and analyzed using Reflexive Thematic Analysis (Flick, 2014) to contextualize quantitative findings. Data collection and analysis are ongoing, with strict adherence to ethical standards and data protection regulations.

Results: Analysis is still in progress. Preliminary observations indicate strong engagement and collaboration among professionals during implementation. Results on perceived changes in care processes, feasibility, and influencing factors will be presented at the congress.

Conclusions: The interprofessional development and implementation of structured home exercise programs foster functional recovery while strengthening collaboration among children, parents, and professionals. By integrating clinical, familial, and interprofessional perspectives, the project aims to restore balance - in tendon function and in the dynamic interplay between all stakeholders during rehabilitation. This work demonstrates how clinical innovation, interprofessional cooperation, and family-centered practice can enhance quality, consistency, and adherence in pediatric hand therapy. The forthcoming results will provide insights into the feasibility, acceptance, and practical impact of standardized yet adaptable postoperative care, illustrating how functional, relational, and systemic equilibrium can be achieved in pediatric rehabilitation.

A-0555 THE PREVALENCE AND DISTRIBUTION OF FOCAL CARPAL CHONDRAL LESIONS CONCURRENT WITH CHRONIC DYNAMIC SCAPHOLUNATE INSTABILITY

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Introduction: There is a paucity of information regarding the prevalence and distribution of focal carpal chondral lesions and their impact on the treatment of patients with symptomatic, chronic, dynamic scapholunate instability (CDSI). Typically, these lesions are not detectable on X-ray but are instead identified during arthroscopy. Once the chondral lesions are identified, they present a treatment challenge, as the general recommendation is to alter the treatment plan; however, there are no established guidelines.

Aim: We aim to determine the prevalence and distribution of focal chondral lesions in patients with a primary diagnosis of CDSI and evaluate if their presence necessitates a change in treatment plan. We hypothesize that a clinically relevant percentage of these cases can be effectively treated with arthroscopic chondral shaving to partial carpectomy, avoiding more extensive surgical treatments.

Material & Methods: We conducted a retrospective cohort study of all wrist arthroscopies performed from January 2008 to December 2020 with a primary diagnosis of CDSI. We excluded all patients with positive X-rays for chondromalacia and/or ulnar-sided wrist pain. We documented the extent and grade of ligament tears and chondral lesions. We debrided ligament tears and treated chondral lesions with chondral shaving to partial carpectomy. We grouped patients based on the presence (CDSI+C) or absence (CDSI-C) of focal carpal chondral lesions. We followed the Debride-First-Then-Wait protocol, which incorporates a waiting period for patients to assess if arthroscopic intervention alone is sufficient to return to normal daily activities. If symptoms persisted or reoccurred, a subsequent Dynadesis (tendon-to-tendon transfer through the distal scaphoid) or partial fusion was performed.

Results: Of 255 consecutive wrist arthroscopies, 164 wrists (155 patients) met the inclusion criteria. Focal chondral lesions were arthroscopically identified in 48% of wrists, with 175 chondral lesions across 16 sites, with one to seven sites per wrist. Its occurrence was significantly higher in older patients ($P<0.001$), wrists with lunotriquetral tears ($P<0.001$), and triangular fibrocartilage tears ($P<0.009$). The most frequent sites were the radial styloid (27%), the scaphoid body (15%), and the proximal triquetrum (11%). Dynadesis^{24,25} was performed in 29% of the CDSI+C and 47% of the CDSI-C cohorts to treat symptoms of CDSI that did not resolve or reoccurred after arthroscopy. Dynadesis was performed within 3 months for 54% of wrists, within the first year for 89% of wrists, and three patients waited longer than 6 years. Three wrists in the CDSI+C cohort needed a partial wrist fusion, two occurring within six months post-arthroscopy, and one three years after. After arthroscopic debridement and chondral shaving, 67% of the CDSI+C and 53% of the CDSI-C cohorts did not request further treatment (7.4-year average follow-up). Of these patients, 56% reported they were able to perform their normal ADLs at the 6-week follow-up and 90% by 3 months.

Conclusions: We found focal chondral lesions in approximately half of the patients with CDSI, and the distribution suggests that scapholunate ligament tears do not occur in isolation. By following a Debride-First-Then-Wait protocol, only 4% of patients with chondral lesions ($n = 3/79$) required a change in treatment plan.

A-0556 RESTORING BALANCE TO THE PARALYSED ELBOW AFTER TRAUMATIC INJURY TO THE BRACHIAL PLEXUS: OUTCOMES OF NERVE TRANSFER

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Introduction: Restoration of elbow flexion is one of the primary objectives after traumatic brachial plexus injury with a variety of nerve transfer and grafting techniques being described.

Aim: This study reviews experience of nerve transfers for reconstruction of elbow flexion after traumatic brachial plexus injury from a single unit.

Material & Methods: Patients who underwent nerve transfer to restore elbow flexion from 1999 to 2023 were identified from the prospective service database. Data included age, injury mechanism, surgery delay, extent of brachial plexus injury, and type of nerve transfer (medial pectoral, ulnar fascicle, intercostal, and accessory). Medial pectoral transfers to the musculocutaneous were carried out through a deltopectoral approach in selected cases of C5-6 or C5-7 injuries if there was good power in pectoralis major and favourable anatomy. Ulnar fascicle transfers for C5-6 or C5-7 injuries were made to the biceps and/or brachialis nerves through a medial arm incision. Transfers of intercostals III, IV, and V to the musculocutaneous nerve were performed for more extensive injuries through lateral chest and axillary incisions. Evaluation included MRC muscle grading and range of active elbow flexion against gravity.

Results: There were 41 patients with a mean age of 34 years (range 18 to 67), 40 men and 1 women. Road accidents caused 37 injuries. The median delay from injury to operation was 80 days (range 8 to 277). Eleven patients had C5-6 injuries, 15 C5-7, 5 C5-8, and 7 C5-T1 supraclavicular injuries, and 3 had infraclavicular injuries. There were 14 medial pectoral transfers, 13 ulnar fascicle, 12 intercostal, and one accessory nerve. Follow-up (mean 43 months, range 24 to 128) was available for 37 patients.

Overall mean MRC grade was 3.4, (median 4, range 1 to 4). For those who gained MRC grade of 3 or 4, mean range of elbow flexion against gravity was 121°. Twenty-three patients gained MRC grade 4, 6 grade 3, 6 grade 2, and 2 grade 1. Eleven of the 13 medial pectoral transfers with follow-up regained MRC grade 4 elbow flexion, one grade 3, and one grade 2 with a mean range of flexion of 120°. Seven were able to lift 3 kg or more.

For ulnar fascicle transfers 6 of 11 patients had grade 4 elbow flexion, 4 grade 3, and one grade 2 with a mean range of flexion of 115°. Four were able to lift 1 kg. All patients had some degree of cocontraction of elbow flexion with wrist and finger flexion.

Six of the 12 patients with intercostal transfers achieved grade 4 elbow flexion and one grade 3 with a mean range of 130°. Four were able to lift 1 kg.

Conclusions: Nerve transfers can provide useful recovery of elbow flexion with indications depending on the extent of brachial plexus injury. The best results were with medial pectoral transfer which also avoids cocontraction of hand movement with elbow flexion which occurs with ulnar fascicle transfer. However, it is most applicable to C5-6 rather than more extensive injuries.

A-0557 FUNCTIONAL HAND SPLINTS IN SPASTIC PARALYSIS: EVIDENCE-BASED CLINICAL APPLICATIONS AND REHABILITATION OUTCOMES

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Introduction: Spastic paralysis affecting the hand represents a challenge in neurorehabilitation, commonly occurring following stroke, traumatic brain injury, and spinal cord injury. The condition is characterized by increased muscle tone, hyperreflexia, and loss of voluntary motor control. Hand spasticity restricts joint range of motion, impairs grasp and release functions, and prevents incorporation of the affected limb into everyday activities. Traditional rehabilitation approaches, while valuable, require augmentation through mechanical interventions. Functional hand splints have emerged as evidence-based orthotic devices designed not merely to provide passive support, but to actively facilitate motor recovery through controlled movement patterns, proprioceptive feedback, and task-oriented practice. These dynamic orthoses enable patients to engage the affected hand in meaningful occupational tasks, promoting neuroplastic reorganization and functional restoration.

Aim: This study aimed to evaluate the clinical efficacy of functional hand splints in patients with spastic hand paralysis. Specific objectives included assessing their impact on spasticity reduction, joint range of motion improvement, prevention of contractures, and enhancement of functional grasp and release capabilities. A secondary aim was to determine the effectiveness of functional splints when integrated with therapeutic exercise protocols in promoting independent practice.

Material & Methods: A prospective clinical study enrolled 10 patients with hand spasticity secondary to neurological injury. Participants were stratified into two groups: a control group receiving conventional hand therapy alone, and an intervention group receiving therapy combined with individualized functional hand splinting. Functional splints were custom-fabricated using thermoplastic materials, designed to support specific movement patterns such as finger extension, thumb abduction, and wrist stabilization. Splint designs included thumb spica configurations for grasp facilitation and finger extension splints for contracture prevention. The intervention protocol spanned 10 weeks with three therapy sessions weekly. Outcome measures included the Tardieu Scale for spasticity assessment, goniometric measurement of finger and wrist range of motion, the Fugl-Meyer Assessment for hand motor function, and functional task performance (grasp, pinch, and release). Patient compliance and comfort ratings were documented through standardized questionnaires.

Results: A prospective clinical study enrolled 10 patients with hand spasticity secondary to neurological injury. Participants were stratified into two groups: a control group receiving conventional hand therapy alone, and an intervention group receiving therapy combined with individualized functional hand splinting. Functional splints were custom-fabricated using thermoplastic materials, designed to support specific movement patterns such as finger extension, thumb abduction, and wrist stabilization. Splint designs included thumb spica configurations for grasp facilitation and finger extension splints for contracture prevention. The intervention protocol spanned 10 weeks with three therapy sessions weekly. Outcome measures included the Tardieu Scale for spasticity assessment, goniometric measurement of finger and wrist range of motion, the Fugl-Meyer Assessment for hand motor function, and functional task performance (grasp, pinch, and release). Patient compliance and comfort ratings were documented through standardized questionnaires.

Conclusions: Functional hand splints represent an effective adjunctive intervention in managing spastic hand paralysis. By combining biomechanical support with neuromotor facilitation, they enable patients to engage in repetitive, task-oriented practice essential for neuroplastic recovery. Integration with therapeutic exercise protocols maximizes functional outcomes and prevents secondary complications.

A-0558 CONVERSION OF FAILED TRAPEZIOMETACARPAL ARTHRODESIS TO TOTAL TMC ARTHROPLASTY: RESTORING BALANCE IN THUMB FUNCTION. A CASE REPORT AND LITERATURE REVIEW

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Introduction: Optimal thumb carpometacarpal (TMC) function relies on a precise balance between skeletal stability, joint congruency, ligamentous integrity, muscular synergy, and neuromuscular control. The TMC joint, with its unique saddle-shaped geometry and multiplanar motion governed by intrinsic and extrinsic stabilizers, contributes up to 40% of hand function. Arthrodesis has historically been indicated in young, high-demand patients due to its ability to restore strength and stability. However, loss of motion, compensatory overload of adjacent joints, hardware-related pain, and high pseudarthrosis rates challenge long-term outcomes. When arthrodesis fails, therapeutic options are limited and scarcely documented.

We present an alternative solution for these patients by restoring mobility and relieving pain through conversion to total TMC arthroplasty.

Aim: To evaluate functional recovery and restoration of biomechanical balance following the conversion of a failed trapeziometacarpal arthrodesis to a total TMC prosthesis, and to contextualize results within the limited literature available, with only three cases described to date.

Materials & Methods: We present a 58-year-old woman with symptomatic thumb carpometacarpal osteoarthritis initially treated with TMC arthrodesis. She developed persistent pain and non-union after a year, with marked limitation of thumb motion and functional imbalance affecting daily activities. She is a manual worker employed in a butcher shop, requiring frequent use of knives.

Following shared decision-making, conversion to total TMC arthroplasty was performed.

Clinical evaluation included pain, range of motion (abduction, antepulsion, opposition), grip and pinch strength, and functional questionnaires. Radiographic assessment verified implant stability and joint alignment. Results were compared with published cases of TMC arthroplasty after failed arthrodesis—two after consolidated but painful arthrodesis and one after pseudarthrosis.

Results: The conversion procedure was successfully performed without the need for additional or revision implant components, requiring only one extra technical step: fluoroscopic identification of the previous joint surface. At final follow-up one year after surgery, the patient exhibited complete functional recovery, normal radiographic appearance, and return to work after rehabilitation. No complications such as dislocation, loosening, or cup malalignment were observed. Comparison with published experiences shows consistent findings: significant pain relief, faster functional recovery, regained thumb mobility, and improved balance between stability and motion. Our experience suggests that arthroplasty is a feasible salvage option even after failed fusion, provided that patient demands and expectations are appropriately aligned.

Conclusions: Conversion of failed TMC arthrodesis to total TMC arthroplasty can restore the delicate balance required for optimal thumb function by re-establishing mobility, reducing compensatory overload on adjacent joints, and potentially decreasing progression toward pantrapezial arthritis while maintaining sufficient stability. Not all manual workers may require arthrodesis: patients performing forceful tasks, such as ours, may depend on powerful grip from the long fingers rather than from the thumb.

Although rarely reported, this procedure offers a promising alternative in selected patients, especially those with symptomatic non-union, bilateral arthrodesis, or desire for increased mobility. Further multicentric studies are needed

to refine indications and long-term outcomes, but the concept of “balance” is essential for decision-making in complex thumb revision surgery.

A-0559 PARTIAL THUMB NECROSIS FOLLOWING RADIAL ARTERY CANNULATION IN A CARDIOVASCULAR PATIENT

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Case Report: We present the case of a 69-year-old female patient with a significant cardiovascular history, including heart failure and prior myocardial infarction, who developed ischemic necrosis of the distal left thumb secondary to compromised radial artery perfusion.

The patient was admitted to the Minimally Invasive Cardiology Department with progressive pain and discoloration of the left thumb following recent radial artery cannulation. On admission, physical examination revealed a cold, cyanotic distal thumb segment proximal to the interphalangeal (IP) joint, accompanied by loss of superficial sensation. Pharmacological therapy aimed at enhancing peripheral circulation was initiated; however, no meaningful clinical improvement was observed. Arteriography of the left upper limb was performed. Angiography demonstrated adequate perfusion via the ulnar artery up to the level of the thumb interphalangeal joint. A hemodynamically significant stenosis of the radial artery proximal to the puncture site was identified, along with a small radial artery pseudoaneurysm (6×7 mm) at the puncture location. Delayed flow through the radial artery into the thumb was also noted.

Despite medical management, progressive necrosis of the distal thumb occurred. A clear demarcation line formed at the level of the IP joint. Given the extent of irreversible ischemic injury, amputation of the thumb at the IP joint was performed, followed by local skin reconstruction.

Conclusion: Radial artery catheterization may result in critical ischemia and subsequent necrosis of the distal thumb, even in the presence of preserved ulnar artery perfusion. Clinicians should maintain a high index of suspicion for digital ischemia following radial access procedures, particularly in patients with significant cardiovascular comorbidities.

A-0561 RELATIONSHIP BETWEEN DEMOGRAPHIC, CLINICAL, AND PAIN-RELATED FACTORS AND THE SEVERITY OF DUPUYTREN'S DISEASE

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Introduction: Dupuytren's disease (DD) is a progressive fibromatosis of the hand that leads to a permanent limitation of hand function.

Aim: The aim of this study was to assess the relationship between demographic, clinical, and pain-related factors and both the severity and functional impairment of patients with DD.

Materials and Methods: Between 2021 and 2025, a total of 541 men and 90 women underwent surgery in our department. A retrospective analysis was performed on data from 65 patients (10 women aged 47–79 and 55 men aged 32–91) with DD who responded to the distributed questionnaires. Linear regression analysis (LOWESS), nonparametric tests (including the Mann–Whitney test), and frequency analysis were used to evaluate correlations between variables. Disease severity was assessed using a subjective functional scale (range 5–25) and the number of contracted fingers. All visualizations

and statistical tests were fully reproducible and performed using the Python programming language with open-source libraries Matplotlib and SciPy.

Results: Age and Sex (Demographic Factors): The severity of DD significantly increased with age, reaching its highest intensity and mean value in the 65–69 age group. The regression trend line indicated a stronger, steadily increasing relationship between age and disease severity in men. The study included 10 women (15.4%) and 55 men (84.6%). The average age of women was 69.3 years, and of men – 60.5 years.

Pain and Severity: A statistically significant difference in disease severity was found between groups (Mann–Whitney test: $p = 0.00718$). Disease severity was significantly higher among patients reporting pain at the site of contracture. Additionally, patients with pain more frequently exhibited incomplete finger extension. No statistically significant relationship ($p = 0.05729$) was observed between pain and a history of prior treatment.

Location and Progression: The fourth and fifth fingers were most commonly affected. Among right-handed patients, more advanced forms of DD were more frequently observed.

Conclusions: Dupuytren's disease is progressive, and its severity is significantly associated with age, sex, symptom duration, and the presence of pain. Men and individuals performing manual labor are particularly prone to a more severe course of the disease, especially in the dominant hand. Pain at the site of contracture may serve as a clinical marker of a more advanced form of DD, associated with reduced manual dexterity. The coexistence of Ledderhose's disease further correlates with higher disease severity. The results highlight the need for early diagnosis and individualized treatment, taking into account demographic, pain-related, and functional factors, as confirmed by the selected statistical tests.

A-0562 THE ARTHROSCOPIC TREATMENT OF THE LATERAL EPICONDYLITIS OF THE ELBOW

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Introduction: Lateral epicondylitis is a frequent upper-extremity overuse injury. Conservative management often shows high recurrence rates and significant occupational limitations. Advances in arthroscopic techniques have positioned arthroscopy as a preferred surgical option.

Aim: The aim of this study was to evaluate the clinical and functional outcomes of arthroscopic treatment for lateral epicondylitis of the elbow, analyzing postoperative pain, functional recovery, return-to-work time, and procedure-related complications in a prospective series of 161 patients treated over a 20-year period

Material & Methods: A prospective descriptive study was conducted on 161 patients treated arthroscopically for lateral epicondylitis between January 2003 and December 2023. Patient demographics, Eaton classification, pain measured with the Visual Analog Scale (VAS), QuickDASH scores, time to return to work, and complications were analyzed.

Results: The mean patient age was 49 years; 70 women and 91 men were included. Based on Eaton classification, 103 patients were Eaton III, 50 Eaton II, and 11 Eaton I. Postoperative VAS scores showed a significant reduction in pain, shifting from severe preoperative levels to mild or minimal pain in most cases. QuickDASH outcomes were excellent or good in 90% of patients. The average time to return to work was 32.7 days. Complications included recurrent pain in 16% and posterior interosseous nerve neuropraxia in 6 patients, all resolving spontaneously within an average of 16 weeks.

Conclusions: Arthroscopic treatment of lateral epicondylitis provides safe and reliable clinical and functional results, with early return to work and excellent or good outcomes in 90% of cases.

A-0564 NOVEL INCISIONLESS ULTRASOUND-GUIDED CARPAL TUNNEL AND A1 PULLEY RELEASE: PROSPECTIVE MULTICENTRE AUDIT FOLLOWING INTRODUCTION TO THE UNITED KINGDOM

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Introduction: Percutaneous ultrasound-guided devices (SpireCut, Sovereign Medical) to release the transverse carpal ligament or A1 pulley are available in the UK.

Aim: A prospective audit monitored safety and efficacy for practitioners introducing 'sonosurgical' procedures into their practice.

Material & Methods: From Dec 2024, patients completed a pre-operative survey, and follow-up at 4 days, 1, 2 & 6 weeks, and 6 months. Data were collected electronically (Cemplicity, UK). Patients were asked about deterioration and any subsequent surgery to the operated hand. Patients completed a validated PROM at baseline, 2 & 6 weeks, and 6 months (either Boston Carpal Tunnel Questionnaire or a Patient Evaluation Measure). Additional bespoke questions included: resolution of night-time symptoms; return to driving; return to employment; performing personal care; and using walking aids.

Results: One hundred and two sonosurgical procedures were performed by 13 surgeons in 17 hospitals.

There were no intra-operative conversion to open procedures, and no returns to theatre. One patient triggered an alert in the post-op period, but investigation reported this was due to contralateral symptoms.

For CTD, the mean change in BCTQ at 2 weeks was 1 (cf. MCID 0.76). Night symptoms resolved in 100% by 1 week. 60% had returned to driving within 4 days, and 93% by 2 weeks. 77% were performing personal care by day 4 and 94% within a week. For A1 pulley release, the mean change in PEM at 2 weeks was 0.9. 100% had returned to driving and personal care within 4 days. 50% were back in work within a week.

Conclusions: Early results suggest sonosurgical procedures provide symptomatic improvement, early return to activities, without reported complications so far.

We must monitor the longer term outcomes in this cohort, and recognise this initial data from early adopters. Purported advantages include earlier recovery, and 'office-based' procedures. A clinical and health economic trial against open procedures is recommended.

A-0565 MANAGEMENT AND OUTCOMES OF HAND AND WRIST INFECTIONS IN LOW- AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: The hand and wrist are particularly susceptible to infection due to constant exposure to the environment through activities of daily living, occupation and recreation. Acute hand and wrist infections can be devastating, with a substantial burden in low- and middle-income countries (LMICs) compared to high-income countries. Access to treatment, particularly surgery, can be limited.

Aim: This study aims to determine the management and outcomes of hand and wrist infections in LMICs.

Material & Methods: A PRISMA-compliant systematic review and meta-analysis searched MEDLINE, EMBASE, Global Health, Global Index Medicus, CENTRAL, CINAHL and Web of Science from database inception to December 2024. Studies of acute bacterial hand and wrist infections managed in LMICs, reporting at least one outcome, were included. Primary outcomes were risk of amputation and mortality. Outcome measures used within the studies were also analysed.

Results: Of 18,208 abstracts screened, 39 full-text studies with 4130 patients were included. These were mostly retrospective case series, from Africa and Asia. Mean [SD] age was 45.0 [9.3] years, with a male preponderance (63.3%). Over half of the studies ($n=22$), containing 878 patients, focused on diabetic hand and wrist infections.

Mean [SD] delay to presentation was 11.8 [6.1] days and deep space infections were the most common presentation (25.3%). Surgery was required for source control in 89.4% patients. Mean [SD] length of stay for admitted patients was 12.2 [14.1] days.

Meta-analysis demonstrated that patients with hand and wrist infections in LMICs face 1 in 4 risk of amputation (26.1% [CI 95% 16.8–36.4]), rising to 1 in 3 in diabetic patients (32.7% [CI 95% 21.3–45.0]). Overall mortality risk across the studies was 2.8% [CI 95% 1.0–5.3]. Risk of bias was assessed as moderate or high in 85% of studies.

Despite the severity of these outcomes, data on long-term impact are limited. Outcome measures were inconsistently used across studies; hand function was reported in less than one-third and health economic outcomes were sparse (five studies).

Conclusions: Hand and wrist infections in LMICs often present late and have high rates of amputation and death, particularly among diabetic patients. Future research, using validated and consistent outcome measurement, is needed to mitigate delayed presentation and identify effective interventions focused to save life and limb.

A-0566 THE IMPACT OF TIME TO SURGERY ON HEALING OF OPERATIVELY TREATED ACUTE SCAPHOID FRACTURES

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Introduction: Scaphoid fractures are the most common carpal bone injuries and are prone to complications such as nonunion and avascular necrosis. While surgical fixation is widely accepted for displaced fractures and increasingly considered for nondisplaced ones, the impact of timing of surgery remains unclear.

Aim: This study evaluates the impact of time to surgery on union rates, healing time, and complication risk in operatively treated scaphoid fractures with a study hypothesis that longer time to surgery would delay healing and increase complications.

Material & Methods: A retrospective review was conducted of 146 adult patients with isolated, acute scaphoid fractures treated by surgical fixation by fellowship-trained hand surgeons from 2016 to 2020. Patients were categorized into three groups based on time from injury to surgery: <3 weeks, 3–6 weeks, and >6 weeks. Outcomes included fracture union, time to union, complications, and bone graft usage. Statistical analyses were performed to assess intergroup differences.

Results: There were no significant differences amongst cohorts regarding preoperative demographics nor fracture characteristics. Union rates decreased with surgical delay with 100% union in those treated within three weeks, 93.5% repaired at three to six weeks, and 88.9% after six weeks ($p=0.014$). Bone graft utilization significantly increased in tandem with increasing times to surgery ($p<0.01$). Among all fractures that healed, median time to union was similar across all groups (95–111 days, $p=0.92$). No differences in complications were seen between groups.

Conclusions: Early surgical fixation of scaphoid fractures (within three weeks) is associated with significantly higher

union rates and reduced utilization of bone grafting. However, time to union remains consistent among fractures that ultimately heal. These findings underscore the importance of timely intervention in optimizing outcomes for scaphoid fractures and support the development of expedited diagnostic and referral protocols.

A-0567 THE EFFECT OF ANXIETY AND MOOD DISORDERS ON COMPLEX REGIONAL PAIN SYNDROME DEVELOPMENT AFTER DISTAL RADIUS FRACTURES

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Introduction: Chronic pain is commonly comorbid with psychiatric conditions like anxiety and mood disorders (AMD). Complex Regional Pain Syndrome (CRPS) is a form of chronic pain most commonly affecting the extremities that can arise after trauma, surgery, or other medical events.

Aim: This study aimed to look at the effect of preexisting AMD on development of CRPS after distal radius fracture (DRF).

Material & Methods: The TriNetX US Collaborative Network was queried for all adult patients presenting for an initial encounter for closed DRFs without preexisting chronic pain from 2005 to 2025. Cohorts were defined by ICD codes into those with preexisting AMD and those never with AMD. Statistical analysis was performed after propensity score matching to determine differences in development of CRPS and general chronic pain between cohorts starting at 3 months after injury. Subanalyses were also run comparing cohorts between operative and nonoperative populations.

Results: In patients with preexisting AMD, risk for developing all outcomes were elevated after 3 months. The risk ratio was 1.615 (1.033, 2.527) to develop CRPS, 2.617 (2.459, 2.786) for unclassified chronic pain, and 2.579 (2.424, 2.745) for either outcome. When only operative patients were analyzed, patients with AMD were not more at risk for CRPS, but over twice as likely to develop chronic pain.

Conclusions: Preexisting AMDs are associated with significantly increased risk of developing CRPS and other forms of chronic pain following DRF starting at 3 months postoperatively. These findings suggest the importance of screening for and identifying psychiatric conditions and symptoms in fracture patients to inform pain management strategies and potentially mitigate chronic pain outcomes post-operatively.

A-0568 OUTCOMES OF MEDIAN NERVE DECOMPRESSION AT THE LACERTUS FIBROSUS: A RETROSPECTIVE REVIEW

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Introduction: Lacertus syndrome is a compression of the median nerve at the proximal forearm, presenting with hand weakness, fatigue, and sensory disturbances in the median nerve distribution. Its diagnosis is frequently overlooked, and poor outcomes following carpal tunnel release (CTR) may reflect a double-crush phenomenon.

Aim: The aim of this study was to assess the outcomes of surgical decompression of the median nerve at the lacertus fibrosus.

Material & Methods: A retrospective review was conducted on patients who underwent lacertus release. All patients who had simultaneous decompression of other nerves were excluded. Surgery was performed through a mini-open transverse approach under local anesthesia. Clinical records were reviewed for symptom characteristics, time to surgery, occupation, and laterality. Outcomes included the QuickDASH (Disabilities of the Arm, Shoulder and Hand) score, as well as visual

analogue scale (VAS) ratings for pain and paresthesias pre- and postoperatively, in addition to patient-reported satisfaction. Results: A total of 68 procedures were performed in 63 patients. Among these, 25 were isolated lacertus releases, of which 28% had previously undergone CTR; 45 involved concomitant CTR, with 9 of these having a history of prior CTR. Women represented 95.6% of the cohort, and 61.8% were manual laborers. The mean age was 54 years, and 38 surgeries were performed on the dominant hand. The most frequent symptom was hyposthesia in the median nerve distribution (48.5%), with a mean symptom duration of 2.8 years. Hand weakness had the longest duration and the poorest recovery. Significant improvements were observed in the QuickDASH score (mean preoperative 58.68 vs. postoperative 15.95), VAS for pain (preoperative 8 vs. postoperative 3), and VAS for paresthesias (preoperative 9 vs. postoperative 2). Overall, 90.3% of patients reported good to excellent satisfaction. Patients undergoing combined lacertus and CTR decompression without previous CTR had lower postoperative QuickDASH scores and significantly higher satisfaction levels. Conclusions: Lacertus syndrome is a common clinical entity, appearing to be more prevalent in women engaged in repetitive manual work, and is frequently associated with CTR. Patients with suboptimal outcomes following CTR should be evaluated for concomitant lacertus syndrome. Surgical decompression results in significant improvements in functional outcomes, pain, and paresthesias, and is associated with high satisfaction rates. Median nerve decompression at the level of the lacertus is a simple and quick technique, minimally invasive, and does not add morbidity. Combined decompression with CTR appears to yield superior outcomes.

A-0569 TRAVEL BURDEN TO CERTIFIED HAND THERAPISTS: A GEOSPATIAL ANALYSIS AND COMPOSITE CHT DEMAND INDEX INCORPORATING SOCIAL VULNERABILITY

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Introduction: Access to Certified Hand Therapists (CHTs) is critical to optimize recovery following hand surgery. The intersection of social vulnerability and spatial proximity to CHT services has not been systematically evaluated.

Aim: This study aimed to characterize national travel burden to CHTs by developing a county-level composite demand index incorporating population size, social vulnerability, and CHT availability.

Material & Methods: This county-level study evaluated CHT access across the contiguous United States. CHT locations were geocoded from the American Society of Hand Therapists directory and linked to county centroid coordinates to calculate distance to the nearest CHT provider. County population estimates and Social Vulnerability Index (SVI) data were obtained from the CDC/ATSDR 2022 database. Broadband internet access data were sourced from the US Census Bureau. A Composite CHT Demand Index (CCDI) was developed to estimate adjusted need. For each county, population size, SVI score, and distance to nearest CHT were normalized using quantile binning (scaled 1–10). These values were summed and then divided by (1 + number of CHTs within 25 miles) to account for local CHT availability. Final scores were rescaled from 0–100 to improve interpretability. Counties were ranked and visualized using choropleth mapping. Associations between distance and social determinants were assessed using Spearman's rank correlation.

Results: The greatest isolation was in Southern and Western counties, with a median distance of 45.7 miles to the nearest CHT compared to 14.6 miles in the Northeast. Longer distance to care was significantly associated with higher poverty ($p = 0.27$; $p < 0.001$), lower broadband access ($p = 0.41$; $p < 0.001$), and greater social vulnerability ($p = 0.33$; $p < 0.001$). CCDI rankings identified high-need counties including Webb and Ector (TX), San Bernardino (CA), and Richmond (GA),

characterized by large populations, high SVI scores, and limited CHT availability. The top decile of demand scores included counties in Texas, Georgia, Arizona, and rural California. However, even in counties >60 miles from the nearest CHT, an average of 75.6% of households had broadband access, underscoring the potential for telehealth expansion.

Conclusions: Spatial disparities in CHT access are compounded by underlying social vulnerabilities. CCDI incorporating geographic, sociodemographic, and provider availability data identifies underserved regions by CHT distribution. These findings may guide strategies to expand equitable rehabilitative care, including telehealth deployment in high-need areas.

A-0571 ANTI-OSTEOPOROTIC MEDICATIONS DO NOT REDUCE LONG-TERM FUTURE FRAGILITY FRACTURES

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Introduction: To evaluate whether the prompt initiation of anti-osteoporosis (anti-Op) medications following a sentinel fragility fracture in postmenopausal women is associated with a reduced risk of future fragility fractures.

Material & Methods: A retrospective cohort study was conducted using the TriNetX US Collaborative Network. Female patients aged ≥ 50 years with an initial, closed distal radius fracture (DRF) were queried. Patients with prior osteoporosis diagnoses, anti-Op use, or fragility fractures were excluded. Cohorts were then stratified by receipt of anti-Op therapy following the sentinel DRF: (Med+), or not (Med-). Propensity score matching was performed across 18 relevant demographic and clinical variables. Risks of subsequent fragility fractures were then compared over 20 years.

Results: After matching, the Med- group had a lower risk of future DRF compared to the Med+ group within 20 years of their initial DRF (5.6% vs 7.8%, $P = 0.0002$, Cohen's $h = 0.088$). The Med- group also had a lower risk of vertebral compression fractures compared to the Med+ group (2.3% vs 3.1%, $P = 0.0453$, Cohen's $h = 0.049$). There were no significant differences in the risk of future hip fractures, proximal humerus fractures, or pelvic fractures between the two groups. Notably, the Med+ group also had a significantly higher risk of undergoing a future DXA bone density scan compared to the Med- group (27.7% vs 17.4%, $P < 0.0001$, Cohen's $h = 0.248$). Alendronate was the most prescribed anti-Op medication (60.1%).

Conclusions: Prompt post-fracture initiation of anti-Op therapy following a sentinel DRF did not reduce the rates of future fragility fractures in postmenopausal women. DRF as a sentinel fragility fracture may not uniformly warrant anti-Op pharmacologic intervention to avoid future fragility fractures. Tailored anti-Op medication therapy should be determined based on shared decision-making.

A-0572 RISK OF EXTENSOR TENDON INJURY AFTER DISTAL RADIUS FRACTURE IS NOT ASSOCIATED WITH EITHER OPERATIVE OR NONOPERATIVE TREATMENT

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Introduction: Distal radius fractures (DRF) are among the most frequently encountered fractures in all of orthopaedics and hand surgery. One of the most common complications of DRF treatment is extensor tendon injury (ETI).

Aim: This study was undertaken to better understand the incidence of ETI after operative vs non-operative treatment of DRF with the hypothesis that greater rates of ETI will be seen in patients with operative treatment.

Material & Methods: The TriNetX US Collaborative Network was queried for all patients diagnosed with DRFs from 2017 to

2022. Cohorts were defined by inclusion and exclusion of International Classification of Diseases-10 (ICD-10) and Current Procedural Terminology (CPT) codes for DRF and split into operative and nonoperative groups and. Cohorts were matched and analyzed for differences in characteristics and outcomes.

Results: A total of 37,380 patients from 2017-2022 were identified. Of these patients, 8,716 were treated operatively, and the remaining 28,664 patients were not. There was a total of 578 ETIs identified after a DRF during the study period, yielding an 5 year risk of injury of 1.77%. After propensity matching, there was no significant difference in the risk of ETI in the operative compared to non-operative groups (1.97% vs 1.60%; $P=0.73$).

Conclusions: The hypothesis was not upheld, as ETI was found to not have a higher incidence rate after operative treatment of DRF vs non-operative treatment. However, patients should be advised of an approximate 2% rate of ETI irrespective of treatment with all distal radius fractures.

A-0573 BIOMECHANICAL EFFECTS OF LIGAMENT EXCISION DURING SCAPHOTRAPEZIOTRAPEZIOD ARTHRODESIS: A WRIST FINITE ELEMENT STUDY

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Introduction: Scaphotrapeziotrapezoid (STT) arthrodesis has been used to prevent arthritic degeneration of the radiocarpal joint or scapholunate advanced collapse (SLAC) wrist. A previous study demonstrated that STT fusion reduced forces in the radiolunate joint and reduced peak forces in the radioscapoid joints as compared to a wrist with an unfused STT joint. Since the modeling of both the unfused and fused STT joints (wrists) retained all ligamentous structures, the question remains whether it is the fusion of the bones alone that obtains the mechanical effect or the intact ligamentous structures that are necessary for this effect to occur. The purpose of this study was to investigate the effects of ligament excision on STT fusion wrist biomechanics using a validated finite element model.

Methods: The model is based on a CT scan of a normal wrist. Three simulations were compared based on the same type I wrist. The first simulation was the healthy baseline previously validated whole-wrist finite element model. The second was a simulated STT arthrodesis fusion performed by creating a unified bone complex comprising the scaphoid, trapezium, and trapezoid. The third modeled the STT fused model with removal of all ligaments in contact with the STT fused bone, performing virtual ligament excision. The models were analyzed under in vivo grip/grasping loads, examining force, radiocarpal articular pressure, and displacement.

Results: The STT fused model with ligaments intact yielded results comparable to the healthy model and validated the changes in force transfer previously published between a fused and unfused STT joint. The fused model without intact ligamentous structures increased axial force transfer to the radius (98%), compared with the healthy wrist conditions (85%). Contact pressure analysis revealed a slight increase at the radiolunate articulation pressure (from 2.35 MPa to 2.75 MPa). While the radioscapoid articulation, which refers to the STT bone complex and radius articulation, showed marginally decreased contact pressures (from 2.3 MPa to 2.2 MPa). There was increased carpal motion compared to the healthy model.

Conclusions:

- Ligament excision likely alters local contact mechanics and carpal kinematics.
- Post-fusion biomechanics showed increased radiolunate contact pressures, indicating altered mechanical interaction through either load redistribution or decreased contact area at this interface.
- The observed increase in carpal motion, aligns with the decrease in stability expected from the absence of ligaments.

- A better understanding of specific ligamentous contributions to wrist mechanics can aid in surgical decision making and treatment of wrist conditions.

A-0574 VALIDATION OF GRIFFITHS III'S C-SCALE FOR PEDIATRIC HAND REHABILITATION

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Introduction: The Griffiths III is widely used to assess developmental progress in early childhood. It is divided in five subscales that investigate the various skills of development. This study is focused on the C-scale, Coordination oculo-manual, that measures early manual and visual-motor skills. It highlights strengths and weaknesses in manual skills that vary according to the age group (from the birth to 6 years old).

Despite its clinical use, there is limited evidence on its validity when used independently to assess hand function in infants with congenital hand conditions. The absence of validated Italian-language assessment tools for the 0–25 month population highlights a gap in the literature and the need for reliable measures in pediatric hand therapy.

Aim: The aim of this study is to validate the use Griffiths III's C-scale as a stand-alone tool for assessing upper limb function in children aged 0–25 months with congenital hand malformation.

This research seeks to determine whether C-scale is a valid and responsive measure for evaluating hand manipulation skills, setting rehabilitation goals, and monitoring therapy outcomes in pediatric hand rehabilitation.

Material & Methods: The population was recruited at San Giuseppe MultiMedica hospital in Milan, from February to December 2024. Inclusion criteria are children under 25 months of age with congenital hand pathologies. Exclusion criteria are lack of parental consent, inability to comprehend the Italian language, and an interval of less than one month between baseline (T0) and follow-up (T1) assessments.

Assessments are performed by trained therapists using Griffiths III's C-scale. Data are collected at T0 (start of rehabilitation) and T1 (follow-up or end of treatment). Statistical analysis is conducted using the Statistical Package for the Social Sciences (SPSS). Internal consistency, validity, responsiveness, and item distribution are calculated.

The scale is not compared with other scales because there are not other validated Italian scales that evaluate the pediatric hand between 0 and 25 months.

Results: It is hypothesized that the Griffiths III's C-scale is valid and sensible in its single use in congenital pathologies of the pediatric hand in children under 25 months and this is confirmed by the statistical analysis. The sample included 16 children (10 males, 6 females).

Analysis reveals a strong correlation among the items of C-scale and it presents the Pearson correlation coefficient (r) of 0.724, supporting internal consistency and demonstrating validity. The mean difference between raw scores at T0 and T1 is statistically significant ($p < 0.01$), indicating sensitivity to clinical change. These results confirm the scale's validity and responsiveness for assessing manual skills in infants with congenital hand conditions.

Conclusions: The Griffiths III's C-scale demonstrates validity and responsiveness as a stand-alone measure for evaluating hand manipulation abilities in children aged 0–25 months with congenital hand conditions. The tool can support clinicians in identifying functional goals, guiding individualized treatment plans, and measuring therapeutic outcomes. Future studies with larger samples are recommended to further confirm these findings and enhance the tool's applicability in pediatric hand therapy.

A-0575 "POINT TO PAIN"; AN AID TO DIAGNOSIS AND TREATMENT IN THE UPPER LIMB PATIENT

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Patients often struggle to accurately indicate the site of their upper limb pain, frequently using the other hand to map out a large area of pain and its radiation. This study assesses the patient's ability to more precisely indicate the area of maximum pain and to assesses the accuracy of the area indicated by "point to pain" in context to the pathology.

Methods: One hundred consecutive patients presenting to an elective outpatient with a painful upper limb were studied. Recorded was the referral information and the patient's description as to the position of their pain. The patient was then asked to indicate where they felt pain. This area was plotted diagrammatically and an assessment made of the percentage of total body surface area. The patient was then asked to point to the area of maximum pain without moving the pointing digit. This was recorded as was the final or working diagnosis based on further examination and studies

Results: The age range was from 18 to 92 years with 72% being female. The commonest referral was hand pain at 38%. The surface area covered by the patient's initial site of pain ranged from one exact localisation to 3% body surface area. 96% of patients included the area of pathology within their initial attempt. When asked to "point to pain", 94% pointed to the site of definitive pathology. 62 % of all cases assessed were degenerative.

Conclusions: This study clearly shows that patients presenting with upper limb pain will in general indicate the area of pain to be of a variable percentage of the limb rarely pointing directly to the site of the pathology. If specifically asked to point to the area of maximum pain in 96% of cases this will directly overlie the pathology so aiding rapid diagnosis and investigation.

A-0576 METHYLPREDNISOLONE FOLLOWING DISTAL RADIUS FRACTURE REPAIR IS ASSOCIATED WITH REDUCED OPIOID PRESCRIPTIONS BUT INCREASED EARLY POSTOPERATIVE COMPLICATIONS: A PROPENSITY-MATCHED ANALYSIS

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Introduction: Effective pain management after distal radius fracture repair is essential for recovery and minimizing opioid reliance. The use of steroids postoperatively has been proposed as a strategy to decrease postoperative pain.

Aim: This study evaluated the impact of methylprednisolone use in the immediate postoperative period on opioid usage, medical outcomes, and surgical complications.

Material & Methods: The TriNetX database was queried for adult patients, with at least three months of follow-up data postoperatively. Patients were stratified into two cohorts: those prescribed methylprednisolone within one week postoperatively, and a control group who were not prescribed methylprednisolone. Cohorts were 1:1 propensity score matched for demographic variables, BMI, existing comorbidities, nicotine dependence, and medication use. Postoperative outcomes were evaluated at 1 week, 2 weeks, 1 month, and 3 months.

Results: Methylprednisolone recipients had significantly fewer opioid prescriptions at 3 months (1.54 vs. 2.14; $p = 0.0152$). However, the methylprednisolone cohort had higher odds of hospital readmission at 1 week (OR 1.33; $p = 0.013$) and 2 weeks (OR 1.29; $p = 0.020$), and more emergency department visits at 1 week (OR 2.23; $p = 0.032$). Respiratory failure was more common at 2 weeks (OR 2.54; $p = 0.010$), 1 month (OR 2.69; $p = 0.004$), and 3 months (OR 2.26; $p = 0.010$). Pneumonia (OR 2.33; $p = 0.022$) and acute renal insufficiency (OR 2.13; $p = 0.046$) were also more frequent at 3 months. Wrist stiffness was significantly less likely in the methylprednisolone group at all time points.

Conclusions: Postoperative methylprednisolone use following distal radius fracture repair was associated with reduced opioid prescriptions but increased early postoperative medical complications. It cannot be determined from this data if the steroids were the cause of the complications or just a correlation. Regardless, these findings highlight the need to administer steroids after distal radius fracture surgery cautiously.

A-0578 LONG-TERM FOLLOW-UP OF UPPER EXTREMITY PROSTHESES THROUGH A MULTICENTER SWISS OUTCOMES REGISTRY: BALANCING DIGITAL LOGISTICS AND HUMAN MOTIVATION

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Introduction: Long-term outcome monitoring in upper extremity prosthesis surgery remains challenging, yet it is essential for understanding implant performance and patient satisfaction. While digital registries enable structured data collection, their success depends on both robust infrastructure and sustained human engagement. The Swiss Upper Extremity Outcomes Registry was established as a multicenter collaboration among specialized hand surgery centers in Switzerland. It monitors clinical and patient-reported outcomes for various prosthesis types, including wrist (Motec), pyrocarbon (Pyrocardan), and trapezio-metacarpal implants (Touch). Over five years, the registry has provided valuable insights into compliance behavior, the impact of patient demographics, and the continuous need to maintain balance between digital efficiency and genuine human connection in long-term follow-up.

Aim: To evaluate long-term follow-up compliance among prosthesis patients and to identify demographic and procedural factors influencing sustained engagement in registry-based outcome collection.

Material & Methods: This analysis includes patients from two participating centers contributing to the Swiss Upper Extremity Outcomes Registry. Data from all patients undergoing upper extremity prosthetic surgery up to May 2025, were analyzed. Follow-up questionnaires were collected electronically at intake (pre-treatment) and at 3 and 12 months postoperatively, followed by yearly assessments for prosthesis cases. Each center is responsible for patient inclusion and data entry, while data monitoring and follow-up reminders are coordinated centrally. Compliance was calculated at each timepoint for patients who had reached the respective interval at the time of analysis. Demographic variables such as age and gender were examined for association with compliance patterns.

Results: Across 96 prosthesis cases from the two centers, overall compliance was 78.1% at intake, 69.8% at 3 months, and 47.1% at 12 months, declining to 25.4% at 2 years and 16.7% at 3 years. Wrist arthroplasty patients (Motec) demonstrated the highest early compliance, likely reflecting structured postoperative pathways and closer surgeon contact. Pyrocarbon prosthesis recipients showed moderate engagement, while thumb base prosthesis (Touch) patients displayed strong early participation but fewer cases had yet reached long-term intervals. Consistent with prior registry experience, older patients demonstrated better sustained compliance than younger cohorts, likely reflecting regular medical follow-up and greater continuity of care. Female patients remained slightly more consistent respondents overall. Patients seen in outpatient clinic near the time of questionnaire distribution were more likely to respond, indicating that alignment of registry activities with clinical workflows supports sustained engagement.

Conclusions: The experience from this multicenter Swiss registry—based on data from two participating centers—shows that long-term follow-up in prosthesis patients requires a dynamic equilibrium between digital logistics and human motivation. Older adults—who represent the core of the prosthesis population—demonstrate strong adherence when continuity with their surgical team is maintained. Age alone does not predict dropout; rather, sustained engagement

depends on personal interaction and clear communication of purpose. This experience highlights that successful registry follow-up is not purely a technical process but a balance between automation and empathy, data and dialogue. Maintaining this balance will be essential to preserve long-term compliance and strengthen both post-market surveillance and patient-centered care.

A-0579 SEVERE HAND AND UPPER LIMB CONTRAST EXTRAVASATION INJURIES, FROM CONSERVATIVE TREATMENT TO COMPARTMENT SYNDROME: A CASE SERIES

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Introduction: Contrast medium extravasation injury is a common complication of intravenous contrast administration. While the majority of patients develop mild, self-limiting symptoms, responding to conservative management, extensive extravasation might result in acute compartment syndrome, a limb-threatening emergency requiring early surgical intervention. We present three cases of upper extremity contrast extravasation injuries that occurred during CT imaging. **Aim:** This presentation aims to highlight the importance of early identification and management of compartment syndrome after contrast extravasation injuries to prevent irreversible tissue damage.

Material & Methods: The first case involves a 71 year old woman that sustained a contrast extravasation injury on the dorsum of the hand while undergoing CT imaging for assessment of gastrointestinal bleeding. The patient presented with marked swelling of the hand, blisters formation, intrinsic minus position of the fingers and severe pain with passive movements. A diagnosis of compartment syndrome was established and emergency dorsal fasciotomy and carpal tunnel release were performed. The second case concerns a 42 year old woman that developed compartment syndrome of the forearm after a contrast extravasation injury when undergoing a CT angiography in preparation for an elective surgery. The patient presented with a remarkably swollen forearm, paresthesias and increasing pain with passive motions of the hand. Following the diagnosis of compartment syndrome, the patient underwent emergency surgical decompression with forearm fasciotomies. The third case is a 32 year old patient that suffered a fall from height. The patient sustained severe head trauma and required intubation. A full-body contrast-enhanced CT scan was performed as part of the initial assessment, during which large volume contrast extravasation occurred in the proximal forearm. Although the forearm and distal arm were considerably swollen, there were no further clinical signs of compartment syndrome. The patient was therefore managed conservatively with limb elevation and close monitoring until the edema resolved.

Results: The postoperative course of the patients that developed compartment syndrome was uneventful. Wound closure was achieved by secondary healing, though delayed wound healing was observed in one patient due to areas of skin necrosis. At the 6 month follow-up both patients showed excellent limb mobility without any residual pain or complications, while in the conservatively managed patient, the edema resolved within a few days.

Conclusions: Although contrast extravasation is a relatively common and usually benign complication, it is crucial to maintain a high index of suspicion of compartment syndrome to ensure timely surgical decompression, in order to prevent permanent tissue and neurovascular damage.

A-0580 DIAGNOSIS OF AMYLOIDOSIS AT PRIMARY CARPAL TUNNEL DECOMPRESSION; A 10-YEAR CASE SERIES

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Introduction: Carpal tunnel syndrome (CTS) may be the earliest manifestation of systemic amyloidosis. A high index of suspicion and biopsy at the time of primary carpal tunnel release may facilitate early diagnosis and subsequent treatment. We present one of the largest single surgeon case series of tenosynovial biopsy at primary surgery.

Aim: The aim of the study is to identify high risk patient characteristics to guide future synovial biopsy in patients presenting with carpal tunnel syndrome.

Material & Methods: A database search of electronic patient records was carried out over a 10-year period (01/01/2015 – 01/01/2025), utilising the keywords 'synovium' and 'synovial'. All samples taken by the senior author at the time of carpal tunnel surgery were identified, and electronic medical records accessed to collect further relevant medical history.

Results: During the study period, 58 patients underwent carpal tunnel decompression with concurrent tenosynovial biopsy. The biopsy was positive for amyloidosis in 29% (17) of the studied patients, with 93% (14) having a new diagnosis. Patients with positive biopsies were older (mean age 75 vs. 63), predominantly male (82% vs. 18%), and exhibited bilateral CTS with severe electrophysiological findings (mean Bland score 4.7). Significant associations were found between amyloid-positive biopsies and co-morbidities including Type 2 Diabetes Mellitus, spinal pathology, chronic kidney disease, and coronary artery disease.

Conclusions: These findings suggest tenosynovial biopsy is a valuable diagnostic adjunct in selected high-risk patients. Identification of predictive clinical features may support the development of a pre-operative screening algorithm to better target biopsy in patients undergoing CTS surgery.

A-0581 DEVELOPING A HAND THERAPY SERVICE FROM START TO NEVER QUITE FINISHED - A 25-YEAR EXPERIENCE OF THERAPISTS AND SURGEONS WORKING SIDE BY SIDE

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The successful management of hand surgery patients requires many things to be in place and the development of a high performing hand therapy service is essential for success and expansion.

Within the Mid Yorkshire Teaching Trust we have developed our hand therapy service over 25 years from a starting point of half a therapist, working with one hand surgeon, to a current position of 24 hand therapists, working across three sites together with seven dedicated hand surgeons.

Presented are 25 years of experience in developing and fine tuning the hand therapy service in parallel with surgical expansion, driven by surgeons and therapist with a single vision responding to peaks and troughs in activity by setting internal standards for patients care.

Discussed is the use of key establishment targets, such as elective waiting times, to enhance recruitment. Also how best to optimise surgeons whilst simultaneously extending therapy numbers and roles. Considered are the benefits from interactive ED pathways and how they can increase therapy activity, clinical diversity and complexity - a close working relationship leading to an expansion of the service and an improved working environment.

Also discussed is how to use data and finance colleagues to produce multiple business cases and make sure associated speciality services expand at the same rate with visible integration - hand therapist and hand surgeons working as one,

developing together and helping to deal with each other's issues.

Presented is a model that any developing unit can utilise to gain funding and build teams that self-propagate and grow.

A-0582 HOW GOOGLE FRAMES PATIENT QUERIES IN TRAPEZIOMETACARPAL OSTEOARTHRITIS: ANALYSIS OF 1,267 'PEOPLE ALSO ASK' ITEMS

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Introduction: Online health information seeking has become integral to patient behavior in hand and upper extremity conditions, often preceding clinical consultation. In trapeziometacarpal (TMC) osteoarthritis, management follows a structured pathway: diagnosis and classification, followed by activity modification, splinting, and other conservative approaches before considering injection or surgery. However, Google's "People Also Ask" (PAA) module displays frequently clicked, thematically linked content rather than reflecting this clinical hierarchy. Understanding how PAA structures information on TMC osteoarthritis is relevant for clinicians, journals, and professional societies guiding patient education. **Aim:** To describe the thematic profile of PAA questions related to TMC OA, to quantify topic-specificity loss after iterative PAA expansion, and to compare PAA ordering with the accepted TMC OA treatment hierarchy.

Material & Methods: This clinician-led content analysis systematically harvested Google "People Also Ask" items for trapeziometacarpal osteoarthritis. Five clinically meaningful English seed queries were entered into Google (US/English interface): "trapeziometacarpal osteoarthritis," "CMC thumb arthritis," "basal thumb arthritis," "thumb base arthritis," and "rhizarthrosis." For each seed, the first 30 PAA returns were captured ($5 \times 30 = 150$). To direct the algorithm toward management-focused material, three items per seed representing distinct clinical pathways (splint/orthosis, injection/medication, surgery/postoperative/complication) were selected as secondary seeds, each yielding 30 suggestions ($30 \times 3 \times 30$). To compensate for under-represented themes, each secondary branch was reseeded with the top two to three clinically closest items. One tertiary branch of the fifth seed (Seed-5-Reseed-3) yielded near-identical phrasing and was therefore restricted to a single reseed. This stepwise crawl yielded 1,267 raw PAA records. Duplicates were initially preserved, then for the analytic dataset, exact text matches were collapsed in R, yielding 732 unique PAA questions. Each question was assigned a second-level theme by automated pattern matching: definition/diagnosis/staging; conservative general; medication; exercise; splint/brace/orthosis; injection; surgery/postoperative/complications; lifestyle/prevention/diet/supplement; and non-specific or unmappable items.

Results: Almost half of the unique questions (338/732; 46.2%) drifted from the TMC osteoarthritis domain toward general arthritis, diet, or non-localized pain. Surgery-related content appeared disproportionately: surgery and postoperative questions comprised 140/732 (19.1%), while all conservative topics combined (exercise, splinting, injection, other conservative care, and general "how to treat" items) totaled 134/732 (18.3%). In other words, Google presents surgery at least as often as all conservative options combined for TMC osteoarthritis. Within the TMC-specific subset (394/732; 53.8%), surgery represented 35.6% of items, showing that even when the condition is correctly identified, the algorithm continues to emphasize surgical over conservative management.

Conclusions: Google's PAA algorithm demonstrates substantial specificity loss (46.2%) and surgical bias when presenting TMC osteoarthritis information, with conservative treatments significantly underrepresented. This algorithmic framing contradicts the stepwise, conservative-first approach fundamental to evidence-based TMC OA management. The observed bias may reflect patients consulting healthcare resources primarily at late surgical-indication stages, while early-stage

patients focus on nutrition and supplements, contributing to conservative treatment remaining underrecognized in digital health environments. Hand surgeons and therapists must proactively develop clinically sequenced, conservative-first content through professional society platforms to ensure patients access balanced information supporting evidence-based decision-making. Enhanced visibility of non-surgical options is essential to align patient education with established treatment pathways.

A-0583 MINIPLATES VS. HEADLESS SCREWS FOR FIXATION OF DISPLACED RADIAL HEAD FRACTURES: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Fixation of displaced radial head fractures using miniplates is technically challenging and has some drawbacks like hardware prominence and limitation of forearm rotation. Fixation by headless compression screws has emerged as a less invasive alternative to miniplates.

Aim: To compare the radiological and functional outcomes of both methods of fixation.

Material & Methods: This single-center, prospective, randomized controlled trial was conducted at an academic level 1 trauma center. Sixty patients with displaced isolated radial head fractures were randomized to treatment using either headless compression screws or miniplates in 2 parallel groups. At the final follow-up of 18 months, patients were evaluated radiologically for union and clinically using the Mayo Elbow Performance Score (MEPS), elbow range of motion, grip strength, the visual analogue scale (VAS) for pain, and the Disabilities of the Shoulder, Arm, and Hand (DASH) score. **Results:** Union was achieved after 8 ± 1.7 weeks in the screw group and after 8.5 ± 2.7 weeks in the plate group. The MEPS was significantly better in the screw group (87.7 ± 10.7) than in the plate group (80.5 ± 13.9). However, this difference is below the minimum clinically important difference (MCID) for the MEPS and as such may not be clinically meaningful. No significant differences were observed between both groups regarding flexion, extension ranges, VAS, grip strength, or the DASH score. However, supination and pronation were significantly better in the screw group. The rate of complications was higher in the plate group (26.7%) than in the screw group (3.3%).

Conclusions: Both techniques yielded comparable outcomes with better forearm rotation, a lower complication rate, and a lower hardware removal rate in the screw group.

A-0584 BALANCED NEUROMUSCULAR REGENERATION AFTER SUPERCHARGE END TO SIDE (SETS) NERVE TRANSFER IN PROXIMAL ULNAR NERVE PALSY MEASURED BY ULTRASOUND

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Introduction: Ultrasound (US) evaluation of neuromuscular regeneration after nerve palsy remains limited. This study aimed to assess grayscale ultrasound changes in ulnar-innervated intrinsic muscles after supercharge end-to-side (SETS) anterior interosseous nerve (AIN) to motor ulnar nerve transfer and correlate them with functional recovery.

Material & Methods: Eight patients (4 male, 4 female; mean age 57.2 years, range 10–80 years) with traumatic or idiopathic cubital tunnel syndrome underwent ulnar nerve decompression and anterior transposition combined with SETS AIN

transfer to the motor branch of the ulnar nerve in the distal forearm. Quantitative US measurements included the first dorsal interosseous (FDIO) and hypothenar (abductor digiti minimi muscle, ADM) muscles. Ultrasound based grayscale (histogram) values were recorded pre- and postoperatively and compared to the contralateral healthy side.

Results: Denervated FDIO muscles demonstrated significantly increased echogenicity compared with the healthy side (mean difference in grayscale [MD] 27.9, 95% CI [12.8, 43.0], $p = 0.001$). At a mean follow-up of 23.9 months (range 7–39 months), grayscale values decreased significantly in the FDIO muscles (MD 20.7, 95% CI [1.9, 39.5], $p = 0.024$), indicating improved muscle quality and reinnervation. In contrast, hypothenar muscle echogenicity did not change significantly (MD 0.8, 95% CI [–46.7, 48.3], $p = 0.865$). Grayscale values of the FDIO muscle correlated significantly with key pinch strength, suggesting a link between ultrasound parameters and functional recovery.

Conclusions: The clinical improvement in pinch and grip strength following SETS AIN transfer to the motor branch of the ulnar nerve transfer correlated with a sonographic decrease in muscle echogenicity and improved morphologic structure, particularly in the FDIO muscle. Quantitative grayscale ultrasound is sensitive to detecting muscle quality changes and may serve as a valuable tool for monitoring reinnervation after nerve transfer surgery.

A-0585 THE USE OF PERIPHERAL NERVE STIMULATOR (PNS) FOR TREATING CHRONIC DRUG-RESISTANT NEUROPATHIC PAIN OF THE UPPER LIMB IN PATIENTS WITH BRACHIAL PLEXUS INJURY

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Introduction: Neuropathic upper limb pain in patients with past brachial plexus injury, non-manageable with pain medication, undermines patient's rehabilitation, whilst often stimulates psychotic episodes and stress. Stimulation of the peripheral nerves aims to alter and improve the perception of pain, in order to reduce the patient-reported pain levels.

Aim: The aim of this study is to present the results of using peripheral nerve stimulation in order to alter the brain perception of chronic neuropathic pain due to brachial plexus injury

Material & Methods: From 2021 to 2025 8 patients, 5 men and 3 women with brachial plexus injury and drug-resistant neuropathic pain were selected for implantation of stimulator electrodes to peripheral nerves for treating dysesthesia, chronic pain and great discomfort of the injured upper limb with VAS score 10.

All patients underwent a preliminary procedure with a trial device for a 15-day period to determine the efficacy of the method. Having noticed over 50% of pain relief, all patients were submitted for the implantation of the permanent device in a minimum period of 8 months.

In 6 cases both median and ulnar nerve were stimulated with 2 electrodes, whereas in 1 case 1 electrode was implanted on the ulnar nerve and in 1 case 1 electrode on the median nerve.

In all cases, under local anaesthesia a small perpendicular skin incision on zone VI of the palmar forearm was used to dissect each nerve. A nerve stimulator electrode, of approximately 60 cm length, with 7 distal poles was introduced over each nerve, using a subcutaneous catheter. After removing the wire, the neurophysiologist stimulated the poles, while the surgeon interviewed the patient concerning the effect. When the patient agreed on an acceptable result concerning the dysesthesia and the pain relief the electrode stimulator was fixed with a non-absorbable suture to stabilise the poles on the site where the nerve stimulator had the optimal result. A skin pocket was dissected subcutaneously to implant the permanent device medially to the distal humerus.

Results: All patients reported significant pain relief right after the introduction of the trial device. Two months after the implantation of the permanent device, 2 patients reported 60% of pain relief, 2 patients 70%, 3 patients 80% and 1 patient

100% total pain relief. Immediate post operatively VAS score was 5 for 6 patients, whilst 2 patients reported VAS score 3. One month post operatively all patients reported VAS score 3.

Conclusions: Peripheral nerve stimulation (PNS) of the upper limb is a minimal invasive therapeutic technique to address patients with peripheral neuropathies, nerve and brachial plexus injuries, who present chronic neuropathic pain with poor correspondence to pain medication. The method is based on a targeted electrical stimulation of specific peripheral nerves, median and ulnar, aiming to alter the transmission of the pain signals to the central nervous system. Inhibitory mechanisms are activated reducing the excitability of the neurons and neurotransmitters such as GABA and endorphins are released. As a result, PNS contributes to improving remarkably patient-reported pain levels, decrease of pain medication and improvement of the quality of life.

A-0586 ARTHROSCOPIC-ASSISTED FOVEAL REATTACHMENT OF TRIANGULAR FIBROCARILAGE COMPLEX TEARS WITH DISTAL RADIOULNAR JOINT INSTABILITY: A COMPARISON OF SUTURE ANCHORS AND TRANSOSSEOUS SUTURES
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Introduction: The best treatment for foveal TFCC tears associated with DRUJ instability is still unclear. Different techniques have been described for these tears (open, arthroscopically-assisted, and all arthroscopic) with different methods of fixation, including transosseous sutures (single or double mattress sutures) and suture anchors (1 or 2 anchors).

Aim: To compare the clinical outcomes of arthroscopically-assisted suture anchor repair and transosseous sutures for repair of foveal triangular fibrocartilage complex tears in patients with distal radioulnar joint (DRUJ) instability.

Material & Methods: Sixty patients with triangular fibrocartilage complex foveal detachment associated with DRUJ instability were prospectively recruited and randomized into 2 equal groups; the anchor repair group and the transosseous repair group. The primary outcome was DRUJ function after 2 years, which was assessed by the DRUJ evaluating system. The secondary outcomes were grip strength, visual analog scale for pain, Mayo Modified Wrist Score, Patient-Rated Wrist Evaluation score, and the Disabilities of the Arm, Shoulder, and Hand score.

Results: There were no significant differences between the groups for any of the outcome measures. Good-to-excellent outcomes (according to the DRUJ evaluation system) were achieved in 27 (90%) patients in the anchor repair group and 26 (86.7%) patients in the transosseous repair group. Fewer complications were observed in the anchor repair group.

Conclusions: Both techniques yielded good and comparable outcomes with a lesser incidence of early complications in the anchor repair group.

A-0587 LOCKED PALMAR PLATE FIXATION FOR ACUTE SCAPHOID FRACTURES: A MULTICENTER CASE SERIES ON UNION RATES

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Introduction: Various surgical interventions have been described for the management of acute scaphoid fractures, such as Kirschner (K-) wires and headless compression screws. While fixation with headless compression screws has demonstrated

high union rates in acute fractures, locked palmar plate fixation is often considered in the acute setting when fracture patterns are more complex. The locked palmar plate is thought to provide superior stability compared with screw fixation. However, it requires a larger approach and the palmar plate may cause hardware-related symptoms.

Aim: To assess radiographic union rates and evaluate the feasibility of locked palmar plate fixation for acute scaphoid fractures.

Material & Methods: A multicentre case series of all consecutive patients with an acute scaphoid fracture, dislocated or comminuted AO Type B4 and B5, treated with locked palmar plate fixation between January 2015, and September 2025 was performed. The primary outcome was radiographic union. Secondary outcomes were time to union, hardware removal and postoperative complications.

Results: Union was achieved in 17 of 19 cases (89.5% [95% CI 66.9–98.7]). The mean time to union was 18.3 weeks (IQR 8.3–24). Plate removal was performed in 7 patients (36.8% [95% CI 16.3–61.6]).

Conclusions: These findings indicate that palmar plate fixation is an effective and feasible technique for managing more severe B-type scaphoid fractures.

A-0589 CONFLICTS OF INTEREST IN HAND SURGERY: RECOGNIZING RISK, NAVIGATING CHALLENGES AND PROMOTING INTEGRITY

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Introduction: Conflicts of Interest (COI) are increasingly relevant in hand surgery, where clinical practice, research, and education intersect with industry. COIs may compromise professional judgement and integrity, particularly in subspecialties reliant on technological innovation and device use. Despite growing awareness, COIs often remain undisclosed or inaccurately reported, raising concerns about transparency and trust.

Material & Methods: This narrative review synthesizes current literature on COI in hand surgery, categorizing types of COI -financial, research-related, personal, social media-associated, and royalty-based. It examines how these conflicts manifest in clinical decision-making, academic publishing, education, and professional advancement. Key studies and databases were analyzed to assess prevalence, disclosure accuracy, and institutional responses.

Results: Financial ties to industry were found to influence study outcomes, academic productivity, and implant selection. Inaccurate disclosures were common, with up to 81% of authors failing to report COIs correctly. Social media use by healthcare professionals revealed widespread undisclosed financial relationships. Educational activities, including CME and mentorship, were also affected by COI, potentially skewing training and career opportunities. Institutional policies varied widely, with limited enforcement and inconsistent disclosure practices.

Conclusions: COIs are pervasive and multifaceted in hand surgery. While collaboration with industry fosters innovation, unchecked COIs risk undermining scientific integrity and public trust. Transparent disclosure, institutional oversight, and education are essential to mitigate these risks. Promoting a culture of integrity ensures that professional decisions prioritize patient care and uphold ethical standards.

A-0590 LATEST EVIDENCE AND RESEARCH ON WALANT

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There has been an exponential increase in WALANT papers in the last 15 years as hand surgeons worldwide recognize the cost effectiveness and efficiency of WALANT surgery in limb surgery namely hand surgery. The JHS Global Online journal nominated 3 topics as the most interesting topics of hand surgery in 2020 and WALANT was voted as the most popular topic. As economics play a bigger role in decisions for healthcare, WALANT is more and more important. Patients too are more educated and with the plethora of information available at the fingertips, more patients are aware of the benefits of WALANT.

In the initial period, there is a flurry of publications of case series and randomized controlled trials. In the past decade, the focus are on systematic reviews as they collate and analyse all the previous studies. However this also revealed a gap in high quality randomized controlled trials. WALANT studies are also lacking in training and education together with policy papers on how to institute WALANT.

WALANT papers in the last decade are being produced by only selected institutions and countries although there is a slow but positive trend as other institutions and countries are also beginning to publish. Also WALANT papers are largely confined to carpal tunnel releases and trigger fingers. More papers need to be published on other diseases such as Dupuytren's or tumours. A final point is that it is quite obvious that WALANT promotes green surgery and is environmentally friendly however there is still reluctance in instituting WALANT in daily practice.

A-0591 SMALL JOINT HERNIA REPAIR - SURGICAL MANAGEMENT OF SMALL JOINT LIGAMENT LAXITY /INSTABILITY - ADDRESSING THE WHOLE CAPSULE WHILST UTILISING LOCALLY AVAILABLE TISSUE

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Introduction: Upper limb small joint laxity may present post injury in an acute phase or more generally many months, or even years, post injury. Alternatively, patients may present with individual or commonly multiple joint laxity issues that have no traumatic cause but continue to progress with pain and dysfunction as the main drivers.

Method: All the above presentations are challenging to treat and in general the smaller the joint the more technically difficult it can be to reconstruct defined ligamentous structures.

When one explores such a joint, be it trauma, congenital or as the result of an inflammatory process, more often than not laxity of a named defined ligamentous structure will be identified but this is often associated with generalised laxity of the whole capsule on that side. This complete single sided soft tissue failure should be assessed and rectified returning the anatomy to its former state.

The presentation asks those managing and operating on such joints to view the soft tissue failure as a single sided joint herniation and so the need to assess and repair all components.

Described is a joint hernia repair concept using the Silfverskiöld suturing technique to deal with named ligament inadequacy and the remaining associated joint capsule deficiency.

The presentation will demonstrate how conceptualising small joint reconstruction in this way will allow the surgeon to integrate the available healthy tissue whilst incorporating small tendon grafts as and when required. The use of this technique in smaller joints will also enable the surgeon to confidently explore and improve the stability of joint with a

lesser degree of instability without the concern of additional ligamentous disrupt.
Conclusion: Small joint hernia repair, a possible solution to many joint instability issues.

A-0593 IS THE PYROCARBON NON-CONSTRAINED IMPLANT EQUALLY VALUABLE FOR STT AND CMC1 OSTEOARTHRITIS? INSIGHTS FROM A SWISS REGISTRY COHORT

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Introduction: The Pyrocardan pyrocarbon interpositional implant is designed as a motion-preserving alternative to fusion for scaphotrapeziotrapezoid (STT) osteoarthritis. Its off-label use for first carpometacarpal (CMC1) osteoarthritis has been reported with limited and conflicting evidence. This study evaluated the clinical and patient-reported outcomes following Pyrocardan implantation for both conditions exploring the balance between motion preservation and pain relief across two anatomically and biomechanically distinct joints.

Aim: To compare outcomes of Pyrocardan arthroplasty for STT and CMC1 osteoarthritis in a multicenter registry, determining whether the implant yields equivalent pain relief and functional improvement in both joints.

Material & Methods: Patients were identified from the Swiss Upper Extremity Outcomes Registry, and retrospectively analyzed. A total of 21 patients (10 with STT OA and 11 with CMC1 OA, 15 women, 6 men; mean age 58 ± 9 years) underwent Pyrocardan arthroplasty between 2020–2025 at two Swiss hand surgery centers.

Assessments were performed at intake and at 3 and 12 months post-operatively. Patient-reported outcome measures (PROMs) included the Patient-Rated Wrist and Hand Evaluation (PRWHE), the Michigan Hand Questionnaire (MHQ), the EQ-5D index and self-rated health score, the Patient-Specific Functional Scale (PSFS), the Numeric Pain Rating Scale (NPRS; rest and load), and satisfaction (rated on a scale of 1–7). Grip, key pinch, and two-point pinch strength were measured as clinician-reported outcomes (CROMs). Follow-up completeness ranged from 40% to 90%, reflecting the registry-based nature of the dataset. Analyses focused on time points with sufficient patient numbers.

Results: Consistent improvement in pain, function, and perceived health was observed across the cohort at 12 months post-operatively. PRWHE total scores improved from 57.4 ± 18.6 to 43.1 ± 16.7 , representing a clinically meaningful improvement. NPRS pain under load decreased from 6.3 ± 1.9 to 3.4 ± 2.3 , and PSFS improved from 4.4 ± 2.6 to 7.2 ± 1.8 . EQ-5D self-rated health increased from 58.8 ± 19.6 to 74.5 ± 13.9 . At 12 months, overall patient satisfaction averaged 5.7 ± 1.1 on a 7-point scale, aligning with the improvements seen in pain and function. Both diagnostic groups demonstrated improvement, with greater relative gains in CMC1 OA (NPRS under load -4.3 vs -0.7 ; PSFS $+3.8$ vs $+2.0$). Grip and pinch strength were preserved over follow-up. A small subset of patients—primarily CMC1 OA cases—had follow-up extending to 2–4 years, in whom PROMs remained stable or further improved, suggesting durable balance between mobility and pain relief over time. Despite partial data capture, results were directionally consistent and clinically meaningful.

Conclusions: Pyrocardan implantation resulted in clinically relevant reductions in pain and improvements in function within 12 months for both STT and CMC1 osteoarthritis. While the implant's role in CMC1 OA remains debated, outcomes in this series were favorable and in several domains exceeded those seen in STT OA. These findings align with emerging evidence that pyrocarbon implants can provide durable, motion-preserving outcomes in thumb and wrist arthritis and support further evaluation of the Pyrocardan in both indications through larger, prospective studies with extended follow-up.

A-0594 DELAYED RADIATION-INDUCED BRACHIAL PLEXOPATHY PRESENTING AS COMPLETE UPPER LIMB PARALYSIS THREE DECADES AFTER RADIOTHERAPY: A CASE REPORT

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Introduction: Radiation-induced brachial plexopathy (RIBP) is a rare but significant late complication of axillary radiotherapy for breast cancer, with reported incidence rates ranging from less than 1% up to 6%. Most RIBP patients present with sensory deficits or mild motor symptoms, while complete sensorimotor paralysis of the upper limb is rare.

Aim: To report a case of complete left upper limb paralysis due to very late-onset post-radiotherapy brachial plexus palsy.

Material & Methods: A 72-year-old woman with previous left breast cancer treated 28 years ago with radical mastectomy and axillary radiotherapy developed progressive, distal-to-proximal sensorimotor loss in the left upper limb. Medical history included a conservatively managed non-union midshaft clavicle fracture complicated by subclavian vein thrombosis. Three years post-fracture, she experienced escalating neurological symptoms, culminating within twelve months in total loss of sensory and motor function in her left arm.

Results: Extensive evaluation was performed. Electromyography indicated sequelae of chronic axonal injury at the level of the brachial plexus cords, mostly affecting anteromedial and anterolateral cords. Magnetic resonance imaging (MRI) of the plexus revealed no abnormal morphology or signal changes. Cervical spine MRI was notable for degenerative changes and disc protrusions at several levels, but without evidence of nerve root compression. Serological tumor markers were negative. Positron emission tomography (PET) scan showed mild, diffuse uptake in muscles near the left clavicle and ipsilateral shoulder, reflecting mild inflammatory activity without clear signs of malignancy. After systematically excluding common causes of atraumatic plexopathy, including tumor recurrence and cervical radiculopathy, a diagnosis of delayed radiation-induced brachial plexopathy was established. Follow-up showed no neurological recovery despite early and intensive physical therapy.

Conclusions: This report describes a delayed, severe case of radiation-induced brachial plexopathy presenting with total sensorimotor impairment. The diagnosis required extensive exclusion of other potential causes such as tumor recurrence and cervical degenerative disease. Few cases in the literature report plexus compromise following clavicle fracture; those that do typically involve marked displacement or significant shortening, patterns absent in this patient. We hypothesize that the prior clavicle fracture, even without major displacement, may have contributed to or accelerated plexus injury, potentially via local fibrosis or changes in the local tissue environment. This case highlights the importance of considering radiation-induced neuropathy in the differential diagnosis of late-onset plexopathy, even decades post-treatment, and underscores the value of thorough workup and long-term neurological follow-up in breast cancer survivors.

A-0595 ELECTROSPUN POLY(LACTIC-CO-GLYCOLIC ACID) NANOFIBRES ON COLLAGEN MAT NERVE CONDUIT SEEDED WITH HUMAN MESENCHYMAL STEM CELL FOR NERVE REGENERATION IN THE MEDIAN NERVE OF MONKEYS

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Introduction: Tissue engineered nerve conduit with cell based therapy is an alternative treatment to autologous nerve graft for treating large nerve defect in peripheral nerve injury. We have developed a nerve conduit composed of poly (lactic-

co-glycolic acid) (PLGA) on collagen mat seeded with mesenchymal stem cells (MSC) using electrospinning technique. Aim: To test its efficacy and safety we used a median nerve defect model using primates (*Macaca fascicularis*). Materials and methods: Nine wild monkeys were recruited and divided into three groups. Nerve gap measuring 30mm was created and the defect was grafted with PLGA/collagen nerve conduit seeded with mesenchymal stem cell (PLGA/Col/MSC), PLGA/collagen nerve conduit without stem cell (PLGA/Col) or autograft (ANG). Results: We were able to produce electrospun fibres that were aligned, with a smooth surface and no beads defects. Electrophysiological studies showed improvement in the compound muscle action potential (CMAP) in PLGA/Col/MSC, PLGA/Col and autograft group by 41/7%, 11.49% and 6.56%, respectively. For latency, the best result was seen in PLGA/Col/MSC group, delay with a difference of 0.8ms latency from its baseline, whilst in the ANG group the latency difference was 1.67ms. Sensory and motor nerve conduction velocity was the best in the autograft graft followed by PLGA/Col/MSC and least in PLGA/Col group. Functionally the outcome for PLGA/Col/MSC was comparable to the autograft group. Two monkeys in the autologous group exhibited self-injurious behaviour attributed to neuropathic pain which was not present in any of the monkey in MSC seeded group. All the nerve conduits were found to be safe with no abnormal blood parameter and no significant abnormal behaviour. Conclusions: Our electrospun collagen coated PLGA nanofibres seeded with mesenchymal stem cell has shown potential in gapping large nerve defects though further improvement is necessary before clinical application.

A-0598 RESTORING BALANCE IN CMC1 ARTHROPLASTY: COMPARATIVE OUTCOMES OF NON-CONSTRAINED AND CONSTRAINED IMPLANTS

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Introduction: Arthroplasty of the first carpometacarpal (CMC1) joint remains challenging, particularly in cases with a very low trapezium where cup placement for traditional ball-and-socket prostheses such as the Touch implant may be at risk. Restoration of biomechanical balance between stability and motion is critical for durable pain relief and function. Pyrocarbon-based interposition arthroplasty has shown preservation of strength and thumb height in thumb base osteoarthritis, supporting evaluation of motion-preserving designs. The Pyrocardan hemiarthroplasty, originally developed for scapho-trapezio-trapezoid (STT) arthritis, may offer a viable alternative.

Aim: To evaluate whether the motion-preserving Pyrocardan implant achieves comparable short-term outcomes to the Touch prosthesis in restoring functional balance after CMC1 arthroplasty.

Material & Methods: Data were extracted from the Swiss Upper Extremity Outcomes Registry, a prospective multicenter registry, and analyzed retrospectively. Two specialized hand surgery centers in Switzerland contributed cases. All consecutive CMC1 arthroplasties were included; outcomes were reported at intake and 12 months using all available observations (unpaired). Pyrocardan was primarily used in less or non-subluxated joints, whereas Touch was applied across the full spectrum of CMC1 osteoarthritis. Patient-reported outcomes included the Numerical Pain Rating Scale (NPRS, rest/loading), Michigan Hand Questionnaire (MHQ), EQ-5D patient VAS (0–100), EQ-5D score (index), and Patient-Specific Functional Scale (PSFS). Objective measures included Kapandji opposition and Jamar grip strength.

Results: Fifty CMC1 arthroplasties were analyzed (Pyrocardan 10; Touch 40). At 12 months, both cohorts showed marked pain reduction and functional improvement, although the small Pyrocardan cohort and unpaired design limit direct comparison. NPRS at rest decreased from 2.29 to 0.40 and under loading from 6.29 to 2.00 with Pyrocardan, versus 4.44

to 1.00 and 7.60 to 2.36 with Touch. MHQ improved from 52.5 to 74.3 with Pyrocardan and 51.1 to 74.8 with Touch. PSFS rose from 3.25 to 7.05 and 4.86 to 7.44, respectively. EQ-5D patient VAS improved from 66.1 to 84.6 with Pyrocardan and 57.2 to 71.9 with Touch, while EQ-5D index improved from 2.09 to 1.64 and 2.22 to 1.56. Kapandji opposition improved in both cohorts; Jamar grip increased in the Touch cohort and was variable for Pyrocardan. Small paired subsets showed similar within-patient changes. No implant-related complications or revisions occurred within one year.

Conclusions: Both implants produced substantial 12-month improvements in pain, function, and health status after CMC1 replacement. Outcomes were broadly comparable: Pyrocardan showed larger gains in EQ-5D patient VAS and PSFS, while Touch showed slightly greater MHQ improvement from a worse baseline. Interpretation requires caution given the limited number of Pyrocardan cases and the unpaired analysis. The apparently quicker pain relief with Pyrocardan may reflect its use in more contained or less subluxated joints rather than intrinsic implant differences. Pyrocarbon implants often follow a more gradual recovery trajectory; larger prospective series with radiographic stratification (e.g., trapezium height and subluxation degree) and standardized strength assessment are warranted to define the long-term performance of Pyrocardan. Its motion-preserving design is consistent with the principle of restoring biomechanical balance in thumb base arthroplasty, particularly for cases with minimal trapezium height or limited bone stock where cup fixation is restricted.

A-0600 DORSAL APPROACH TO THE ANTERIOR INTEROSSEOUS NERVE IN TARGETED MUSCLE REINNERVATION FOR SUPERFICIAL RADIAL NERVE NEUROMA: CASE REPORT AND LITERATURE REVIEW

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Introduction: Targeted muscle reinnervation (TMR) is an increasingly popular approach in neuroma management in the upper limb. Previously described recipients for TMR in superficial radial nerve (SRN) neuromas include intrinsic hand muscles, extensor carpi radialis longus, extensor carpi radialis brevis and the anterior interosseous nerve (AIN).

Aim: We describe a case of distal SRN neuroma in continuity treated with TMR via a dorsal approach to AIN branches. Furthermore we perform a literary review of current evidence for the management of SRN neuromas with TMR.

Material & Methods: We describe the novel use of a dorsal approach to the AIN in TMR for a patient with a distal SRN neuroma at the MCPJ level of the thumb causing debilitating pain and stiffness. The intraoperative steps allowing successful coaptation of the SRN to the AIN motor branch to the pronator quadratus are described. This was carried out by creating a small window in the interosseous membrane through a small dorsal approach, thereby eliminating the need for volar dissection. A literature review of the PubMed database was undertaken to explore the use of TMR in SRN neuroma and identify the nature of currently described approaches. The number of cases described, the motor targets and approaches used, and postoperative results were recorded.

Results: Following TMR, there was complete resolution of the patient's pain symptoms. The patient was able to commence hand physiotherapy, regaining significant mobility. Our literature review identified seven papers describing the use of TMR in SRN neuroma. In total 17 cases were captured, and the study with the largest patient data included six RSN cases treated by TMR.

The commonest motor target used for TMR was the AIN, described in 12 out of 17 cases. The expendable motor branch to the pronator quadratus and a transferable nerve length up to 70mm made for a versatile target for TMR. The approach to the AIN in all the cases described involved creating, or extending into, a volar incision. Volar dissection was undertaken to allow nerve identification. Supinator motor branches were described in three cases, the posterior interosseous nerve in one and the extensor carpi radialis brevis (ECRB) in one case. Dorsal approaches were employed for TMR to the ECRB, PIN and supinator.

A mean follow up time of 14 months was undertaken across these cases. Symptoms of pain resolved or greatly diminished in all 17 cases, and there were no recorded cases of functionally relevant motor weakness postoperatively.

Conclusions: There is limited evidence for the management of RSN neuromas with TMR. While a number of motor targets for TMR are described in the literature, the most versatile and commonly used option available is the AIN. Our case report describing the novel use of a dorsal approach to the AIN in SRN neuroma adds one more option to the nerve surgeon's armamentarium in managing this often debilitating condition.

A-0601 FIVE YEARS OF THE SWISS UPPER EXTREMITY OUTCOMES REGISTRY: INSIGHTS ON BALANCING DIGITAL LOGISTICS AND HUMAN MOTIVATION IN SUSTAINED PATIENT ENGAGEMENT

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Introduction: The Swiss Upper Extremity Outcomes Registry was established five years ago to systematically collect patient-reported and clinician-reported outcomes in hand and wrist surgery. Initially launched at a single specialized hand center, it has since expanded to a collaborative network of five participating institutions across Switzerland. The registry follows the International Consortium for Health Outcomes Measurement (ICHOM) Standard Set for Hand and Wrist Conditions, complemented by additional questionnaires and specific tracks tailored to the needs of different centers and procedures. Over time, the registry has provided valuable insights into the factors that enable or limit its sustainability. Our experience suggests that a successful registry requires balance between institutional commitment, digital logistics, and human motivation.

Aim: To summarize the main lessons learned from the first five years of developing and operating a multicenter outcomes registry for upper extremity surgery, focusing on patient engagement, compliance, and organizational sustainability.

Material & Methods: Data are collected longitudinally through electronic questionnaires distributed to patients at intake (before surgery or treatment) and at 3 and 12 months after treatment initiation. For patients receiving prosthetic reconstructions, follow-up continues on a yearly basis to allow long-term outcome tracking over decades. Each participating center is responsible for patient inclusion and data entry, while data monitoring, quality control, and distribution of follow-up reminders are coordinated centrally. The structure and processes of the registry have evolved continuously based on feedback from surgeons, administrative staff, and patients. Observations across centers were analyzed qualitatively to identify key factors supporting or hindering compliance, workflow efficiency, and data quality.

Results: Experience from the first five years highlights the decisive role of human interaction in registry participation. Active engagement of surgeons and secretarial staff proved central in motivating patients to complete follow-up questionnaires. Many patients included personal remarks in their responses, expressing trust, gratitude, and a sense of connection with their physician. Patients attending outpatient consultations near the time of questionnaire distribution showed notably higher response rates, suggesting that personal contact and continuity of care may play an important role in sustaining participation. Based on user feedback, several factors appear to contribute to non-compliance, including loss of direct contact with the treating team, technical challenges in completing digital follow-ups, and perceived questionnaire burden once recovery is achieved.

Conclusions: Insights from this experience are guiding ongoing registry improvements. Current efforts focus on optimizing both questionnaire content and digital logistics—reducing question volume where possible, improving user experience through clearer presentation and fewer clicks, and creating a smoother, more engaging digital environment. Institutional

commitment, logistical resources, and leadership support remain essential to ensure consistent data collection and long-term sustainability. While integration with hospital information systems remains a goal for the future, such linkage is expected to enhance efficiency and data accuracy. Ultimately, registries perform best when they remain visible and interactive—used in outpatient clinics, feedback discussions, and team meetings—rather than operating passively in the background.

A-0602 A MULTICENTRIC, EVALUATOR-BLINDED, RANDOMIZED EVALUATION OF CARBOXYMETHYLCELLULOSE AND POLYETHYLENE OXIDE ANTIADHESIVE GEL FOLLOWING REVISION SURGERY FOR PERSISTENT OR RECURRENT CARPAL TUNNEL SYNDROME

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Introduction: Persistent or recurrent carpal tunnel syndrome (rCTS) remains a difficult condition to manage surgically, mainly due to fibrosis and perineural adhesions compromising median nerve recovery. Traditional coverage techniques, such as the hypothenar fat pad flap, are effective but technically demanding and time-consuming. Bioresorbable antiadhesive agents like carboxymethylcellulose and polyethylene oxide (CMC-PEO) gel could offer an easier and potentially more efficient alternative to prevent postoperative adhesions. This multicentric randomized study aims to evaluate the effectiveness and safety of CMC-PEO gel compared with the hypothenar fat pad flap in revision surgery for persistent or recurrent rCTS. **Aim:** To demonstrate that carboxymethylcellulose and polyethylene oxide (CMC-PEO) antiadhesive gel reduces postoperative pain and complications, improves functional outcomes, and shortens surgical time compared to the hypothenar fat pad flap for median nerve coverage following revision surgery for persistent or recurrent carpal tunnel syndrome (rCTS).

Material & Methods: This multicentric, evaluator-blinded, randomized clinical trial involves 50 participants with recurrent or persistent rCTS. Randomization is 1:1 to receive either CMP-PEO (Group 1) or hypothenar fat pad flap coverage (Group 2) after revision surgery of neurolysis. Participants will be assessed at baseline, week 1, week 4 and week 12 postoperatively. Outcomes measures include Visual Analog Scale (VAS) for pain, Quick Disabilities of the Arm, Shoulder, and Hand score (Quick DASH) for hand function, DN4 score for neuropathic pain, electroneuromyography for nerve recovery and dynamometer testing for grip strength. Data will be collected and analysed by blinded evaluators

Results: Preliminary analysis demonstrates significant improvements in the CMC-PEO group compared to the hypothenar fat pad flap group. CMC-PEO use resulted in greater reductions in pain (average -0.8 VAS points) and neuropathic symptoms (30% regression of DN4 scores). Functional recovery, as measured by the Quick DASH, improved by 18 points on average in the CMC-PEO group, compared to 10 points in the control group. Additionally, surgical time was reduced by an average of 15 minutes in the CMP-PEO group.

In conclusion CMP-PEO significantly reduced postoperative pain and neuropathic symptoms compared to the hypothenar fat pad flap. It demonstrated greater improvements in hand functionality, supporting its role in preventing adhesion-related impairments.

CMC-PEO represents a promising option for reducing complications and improving outcomes in revision surgery for rCTS

Conclusions: This study underscores the potential of CMC-PEO as a safer, faster, and more effective alternative to traditional methods for managing persistent or recurrent rCTS. Further randomized controlled trials are needed to validate these findings and establish CMC-PEO as a new standard in rCTS revision surgery.

A-0603 EXPLORING THE BALANCE IN THUMB CARPOMETACARPAL OSTEOARTHRITIS: BIOMECHANICAL AND PSYCHOLOGICAL DETERMINANTS OF DISABILITY

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Introduction: Thumb carpometacarpal (CMC) osteoarthritis significantly impacts hand function, affecting millions worldwide. This condition disrupts biomechanical balance essential for grip strength, pinch force, and fine motor control. However, patients with similar radiographic severity demonstrate markedly different functional outcomes; some with advanced damage maintain function, while others with mild changes experience severe disability. This structure–symptom discordance indicates that disability in thumb CMC osteoarthritis cannot be explained by biomechanical impairment alone. Psychological factors such as kinesiophobia, depression and anxiety may mediate between structural damage and disability. Despite biopsychosocial model recognition, the relative contributions of physical versus psychological factors remain poorly characterized. Clarifying their comparative contribution is essential to designing rehabilitation strategies that restore functional balance.

Aim: To determine the relative contributions of biomechanical factors and psychological factors to functional disability in thumb CMC osteoarthritis and to identify the principal determinants of disability.

Material & Methods: Ninety patients with radiographically confirmed thumb CMC osteoarthritis (mean age 60.7±9.5 years, 90% female) undergoing conservative treatment were evaluated cross-sectionally. Outcomes included disability by QuickDASH (primary) and Thumb Disability Index (TDI). Predictors included pain intensity by visual analogue scale, strength by dynamometer (grip strength and lateral pinch strength), range of motion by goniometer (TMC flexion and abduction), psychosocial status by Hospital Anxiety and Depression Scale (HADS), and Tampa Scale for Kinesiophobia. Spearman correlation coefficients (r) were computed between predictors and outcomes. Variance explained (r^2) from these univariable correlations was used to describe the relative contribution of each factor to disability.

Results: Correlation analysis demonstrated psychological factors' dominance over physical factors in predicting disability (QuickDASH). Kinesiophobia was the strongest predictor ($r=0.520$, $p<0.001$, 27.0% variance)—nearly double grip strength ($r=-0.373$, $p<0.001$, 11.4% variance). Fear of movement was 3.9 times more influential than pain severity ($r=0.264$, $p=0.012$, 7.0% variance). Predictor ranking: Kinesiophobia (27.0%), Grip strength (13.9%), Anxiety (7.1%), Pain severity (7.0%), Lateral pinch (4.3%). Psychological factors (kinesiophobia+anxiety) explained 34% of disability variance versus 18% for physical factors (grip+pinch)—demonstrating 1.9-fold psychological dominance. Depression showed no significant association ($r=0.156$, $p=0.141$). Pain severity weakly correlated with kinesiophobia ($r=0.247$, $p=0.019$). TMC flexion showed no associations (all $p>0.05$). TMC abduction correlated with grip ($r=0.350$, $p<0.001$), lateral pinch ($r=0.212$, $p=0.045$), and pain ($r=-0.277$, $p=0.008$), but not disability ($r=0.071$, $p=0.503$).

Conclusions: Psychological factors and biomechanical impairment both contribute to disability in thumb CMC osteoarthritis, but their relative weight is not equivalent. In this cohort, kinesiophobia and anxiety showed stronger associations with functional limitation than grip or pinch strength, with kinesiophobia explaining approximately fourfold more variance in disability than pain intensity, and the combined psychological variables accounting for almost twice the variance explained by physical measures. The weak correlation between kinesiophobia and objective strength or pain suggests that fear-related beliefs represent a partly independent and potentially modifiable treatment target. These findings support integrating biopsychosocial assessment frameworks with standard radiographic and functional evaluation. Rehabilitation programs for thumb CMC osteoarthritis should address fear-avoidance and anxiety. Future research should investigate targeted psychological interventions within biopsychosocial programs to optimize functional outcomes, moving beyond traditional strength-focused approaches toward holistic care models.

A-0604 EARLY EXPOSURE TO ORTHOPLASTIC HAND TRAUMA: A TWO-CENTRE EVALUATION OF A NOVEL SUZUKI FRAME SIMULATION TRAINING EXPERIENCE

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Introduction: Structured opportunities for hand trauma training remain limited at the undergraduate and foundation level, particularly in K-wire external fixation techniques like the Suzuki frame. These skills demand understanding of both skeletal mechanics and K-wire technique. Simulation offers a safe, reproducible environment to acquire these skills. Although the procedure is typically performed by senior surgeons, its main competencies, including anatomical orientation and K-wire control, are foundational to early surgical education.

Aim: This two-centre, pooled study aimed to evaluate changes in trainee confidence, procedural competence, and perceived educational value following structured training using a novel Suzuki frame simulator.

Material & Methods: 53 participants (45 medical students, 8 foundation doctors) completed a structured workshop including didactic teaching and supervised practice using a K-wiring and Suzuki frame simulator. Confidence was measured pre- and post-workshop on a 5-point Likert scale across domains of anatomy, K-wire handling, wire placement, and frame design. Procedural competence was assessed post-workshop using supervisor-rated Objective Structured Assessment of Technical Skills (OSATS). These were completed by experienced facilitators, scored independently across five global domains (positioning, instrument handling, economy of movement, tissue handling, aseptic technique) and five task-specific domains (fixation principles, wire orientation, frame assembly, construct stability, procedural flow). Simulator realism and educational value were rated on 5-point Likert scales by participants and consultant or senior resident supervisors. **Results:** Of 53 participants, 50 (94.3%) had no prior Suzuki frame experience. Confidence improved significantly across all domains ($p < 0.01$) with mean increases of 1.43 in anatomical familiarity (2.54 ± 0.41 to 3.97 ± 0.47), 3.08 in K-wire handling (1.06 ± 0.45 to 4.14 ± 0.63), 2.78 in wire placement (1.11 ± 0.47 to 3.89 ± 0.71), and 2.86 in frame design (1.09 ± 0.39 to 3.95 ± 0.68).

Across pooled OSATS data ($n = 53$), mean global performance was 3.26 ± 0.94 and task-specific performance was 3.28 ± 1.04 . Fixation principle understanding (3.30 ± 1.03) and aseptic technique (3.08 ± 0.93) were highest rated. Across assessed domains, 75% of participants scored $\geq 3/5$ in at least half of OSATS domains, suggesting a potential competency benchmark for future prospective validation. Inter-site comparison demonstrated no significant difference in mean OSATS ($p = 0.47$), confirming reproducibility for future studies.

Simulator realism (4.37 ± 0.52) and educational value (4.57 ± 0.48) were rated highly by both participants ($n = 53$) and supervisors ($n = 8$).

Conclusions: This two-centre evaluation of a novel Suzuki frame simulator demonstrates significant, reproducible improvements in trainee confidence and technical ability. Although the technique is specialised, early introduction of its core orthoplastic principles provides a safe way to build transferable skills in precision and stability, enhancing preparedness for clinical exposure. Consistent results between centres support the model's generalisability and highlight its educational value. These findings also support potential application within scalable, structured early hand trauma teaching for undergraduate and foundation trainees. This exploratory study offers a broad dataset to inform future endpoints and refinements, including longitudinal assessment of skill retention and a multi-centre national teaching series to further validate and standardise this simulator.

A-0605 FROM SHATTER TO FLUTTER: ACHIEVING EQUILIBRIUM AND FUNCTIONAL MOTION WITH DYNAMIC TRACTION SPLINTING IN A COMMUNED PIP JOINT FRACTURE

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Introduction: Intra-articular PIP joint fractures are complex injuries and, if not appropriately treated, can result in long-term stiffness and functional impairment. Dynamic traction splinting offers a non-surgical option that supports early mobilization while promoting functional recovery with an emphasis on the restoration of joint equilibrium.

Aim: To evaluate the functional outcomes of a comminuted intra-articular PIP joint fracture treated by conservatively with a custom made dynamic traction splint, focusing on early mobilization.

Material & Methods: We present a case of a 41-year-old left-hand dominant male sustained a comminuted intra-articular fracture of the left ring finger PIP joint while performing jiu-jitsu. Patient presented with pain, swelling, and limited range of motion with no neurovascular insufficiency. Radiographs and CT scans confirmed comminuted intra-articular fracture at the base of the intermediate phalanx. Surgical options, including Suzuki frame or Ligamentotaxor, were offered, but the patient opted for conservative management. Treatment included a custom-made, hand-based dynamic traction splint combined with an individualized early active motion program. The splint provided continuous longitudinal traction across the PIP joint while permitting controlled active-assistive exercises to prevent contracture. It was worn 24/7 for four weeks, followed by supervised hand therapy. Assessments were performed at baseline, 3, 6, and 9 months. Functional status was evaluated using the QuickDASH, grip strength with a hand-held dynamometer, and total active motion (TAM) with a finger goniometer.

Results: During follow-up, the patient showed a gradual improvement of all the functional parameters. The QuickDASH score decreased at each evaluation, exceeded the Minimal Clinically Important Difference (15.91). Baseline measurements were 90.9 for QuickDASH and 55° for total active motion. At 3 months, QuickDASH was reduced to 47.7, while grip strength was 27.7 kg, and TAM improved to 75°. At 6 months, QuickDASH was 29.5, grip strength 37.4 kg, and TAM improved to 80°. By 9 months, QuickDASH further decreased to 2.2, grip strength reached 42 kg, and TAM reached 85 degrees. Weekly follow-ups supported adherence to the dynamic traction splint protocol and early mobilization program. During this time, no complications were noted. Imaging at 9 months showed joint-space narrowing suggestive of partial fusion. This radiological findings (x-ray & CT scans) was not reflected in the patient's functional status and further surgical intervention was not indicated from surgeon's points of view. The patient stated that he was able to perform his daily activities and was able to return to jiu-jitsu with no limitation.

Conclusions: The described case shows that dynamic traction splinting can achieve functional results even in comminuted intra-articular PIP fractures where surgery not preferred. Early mobilization and compliance of the patient are essential for optimizing recovery. This fact underlines the importance of the dynamic traction splint in the process of restoring equilibrium and the balance of the functioning hand.

A-0606 CLINICAL AND FUNCTIONAL OUTCOME OF TERES MAJOR TRANSFER VERSUS DOUBLE NERVE TRANSFER WITH PERCUTANEOUS ANTERIOR SHOULDER RELEASE AROUND THE SHOULDER JOINT IN LATE OBPP PATIENTS

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Introduction: Obstetric brachial plexus palsy (OBPP) is a disabling condition that often results in internal rotation contracture of the shoulder due to muscular imbalance. Although many infants' spontaneous recovery, a significant residual deficit may occur.

Aim: To evaluate and compare the early functional outcomes of neurotization, (new nerve transfer) and tendon transfer teres major tendon to infraspinatus tendon for restoring shoulder abduction and external rotation in children with sequelae of OBPP with limited abduction and external rotation shoulder.

Material & Methods: : randomized controlled study included 60 patients (aged 2–4 years) with residual OBPP, two groups. Group 1 (n = 30) underwent double nerve transfer (spinal accessory nerve [SAN] to the infraspinatus motor branch and teres major [TM] motor branch to teres minor [Tm] motor branch) with anterior shoulder release. Group 2 (n = 30) underwent tendon transfer (teres major to the infraspinatus tendon insertion) with anterior shoulder release. Functional outcomes were assessed using range of motion and modified Mallet scoring during a mean follow-up period of approximately 26 months.

Results: Both groups showed statistically significant improvement in abduction and external rotation. Group 1 (nerve transfer) achieved greater gains in active abduction (+52.3°) and external rotation (+54.1°) with superior results in Mallet abduction and hand to spinescore with preservation of midline function, compared to tendon transfer (+39.5° and +55°, respectively), whereas 83.3% of the tendon transfer group developed loss of midline activity.

Conclusions: Both tendon transfer and nerve transfer effectively improved shoulder abduction and external rotation in patients with OBPP. However, nerve transfer provided more physiological motion, better overall functional outcomes, and preserve midline (LOM).

A-0607 IATROGENIC MEDIAN NERVE INJURIES AT THE LEVEL OF WRIST AFTER MINI-OPEN OPERATIONS- ANALYSIS OF THE CASES. WERE THEY AVOIDABLE?

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Introduction: Iatrogenic injuries to median nerve at the level of wrist under mini-open operations do happen.

Aim: The first aim of the study is to analyse the iatrogenic causes of median nerve injuries in mini-open wrist operations. The second aim is to show whether the injuries were or not avoidable. The third aim is to show the crucial role of ultrasound assessment.

Material & Methods: Analyses of preoperative USI in 200 cases and in 20 patients with median nerve injuries and dysfunctions who underwent mini-open operations on the level of wrist. The role of ultrasound in preoperative and postoperative nerve assessment.

Results: Clinical and ultrasound median nerve investigation shows its crucial role in planning and surgical treatment.

Conclusions: The analysis of cases shows that median nerve injuries might be avoided. The role of ultrasound investigation is crucial in prevention of median nerve injuries under operations at wrist level.

A-0608 CLINICAL AND ELECTROPHYSIOLOGICAL COMPARISON OF RADIAL EXTRACORPOREAL SHOCKWAVE AND OZONE THERAPIES IN CARPAL TUNNEL SYNDROME: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Aim: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy causing pain, paresthesia, and loss of hand function. Although conservative approaches such as radial extracorporeal shock wave therapy (rESWT) and perineural ozone injection offer promising results through different biological mechanisms, high-quality clinical studies directly comparing these two methods are limited. The aim of this study was to compare the clinical and electrophysiological efficacy of rESWT and ozone injection added to splint therapy with splint therapy alone in patients diagnosed with mild-to-moderate CTS.

Material & Methods: This randomised, single-blind controlled study included 54 patients, who were divided into three groups: rESWT + splint, ozone injection + splint, and splint alone. Grip strength, finger strength, Boston Carpal Tunnel Questionnaire (symptom severity and function subscales), pain level, median nerve cross-sectional area (CSA), and nerve conduction parameters were assessed before treatment, at the end of treatment, 4 weeks after treatment, and 12 weeks after treatment.

Results: Significant improvements were observed in grip strength, finger strength, Boston function and symptom severity, and pain scores in all groups during treatment ($p < 0.001$). However, at the 3-week and 1-month evaluations, improvements in these clinical parameters were significantly higher in the rESWT and ozone groups compared to the splint group ($p < 0.05$). Electrophysiologically, there was a significant improvement in median nerve cross-sectional area (CSA), sensory and motor conduction velocities, amplitudes, and latencies in all groups ($p < 0.001$); however, CSA narrowing, increases in nerve conduction velocities, and decreases in latencies were more pronounced in the rESWT and ozone groups compared to the splint group ($p < 0.05$). When comparing pre- and post-treatment change values, it was determined that rESWT and ozone therapy demonstrated similar therapeutic effects and that both treatments provided significant superiority over splint application in both clinical and electrophysiological parameters ($p < 0.001$).

Conclusions: This study demonstrated that both radial extracorporeal shock wave therapy (rESWT) and ozone injection were more effective than splint treatment alone in improving the clinical symptoms of carpal tunnel syndrome and the electrophysiological characteristics of the median nerve. The improvements observed in grip strength, pain levels, functional scores, and nerve conduction parameters indicate that rESWT and ozone therapy have similar therapeutic efficacy. Since both methods provide significant superiority over splint application, rESWT and ozone therapy can be considered effective and safe alternatives among conservative treatment options.

A-0609 DOES KINESIOPHOBIA AFFECT HAND GRIP STRENGTH IN PATIENTS WITH RHEUMATOID ARTHRITIS?

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Introduction: Aim: Rheumatoid arthritis (RA) is a systemic inflammatory disease that can affect tissues containing synovium. The hand is affected early and specifically because it is rich in synovium, the target tissue in RA. Kinesiophobia is a fear and avoidance of physical activity stemming from sensitivity to painful injury and repeated injury. Pain is one

of the most common symptoms of RA. Pain makes RA patients prone to developing kinesiophobia, and these patients may experience muscle strength loss by avoiding physical activity. The aim of this study is to investigate the relationship between kinesiophobia and hand grip strength in RA patients.

Material & Methods: The study included 50 patients diagnosed with RA and under follow-up (n= 40 female, n= 10 male patients). Dominant hand grip strength, kinesiophobia, and pain were assessed using a hand dynamometer, the Tampa Kinesiophobia Scale, and the Visual Analog Scale (VAS), respectively. The Pearson Correlation Test was used for the analyses.

Results: The age of the patients participating in the study (mean $\pm$ standard deviation) was 52.1905 ± 13.47383 . High kinesiophobia was observed in 82% of the patients. The mean kinesiophobia score of the patients was 41.56. Moderate pain was observed in 28.0% of the patients. The average pain score of the patients was 3.86. A positive and significant correlation was found between pain and kinesiophobia ($r = 0.320$, $p = 0.023$). No significant correlation was found between kinesiophobia and dominant hand grip strength ($r = -0.53$, $p = 0.715$).

Conclusions: Pain is the most common symptom in RA patients and may contribute to the development of kinesiophobia. The results of our study suggest that pain may have an effect on kinesiophobia. Therefore, considering the possibility of kinesiophobia developing in RA patients and applying the necessary treatments may increase the success of rehabilitation. Future studies may focus on examining the effects of kinesiophobia treatment and its impact on grip strength in RA patients.

A-0610 EXAMINATION OF THE RELATIONSHIP BETWEEN SENSATION AND FUNCTION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction: Aim: The hand is affected early and specifically because it is rich in synovium, the target tissue, and a significant decline in hand function may be observed in rheumatoid arthritis (RA). In RA, the peripheral or central nervous system may be affected, or neuropathy may develop due to synovitis, vasculitis, and drug toxicity. Because RA treatment focuses on pain and inflammation control, sensory assessment may be overlooked. The aim of this study is to investigate the relationship between sensation and functionality in RA patients.

Material & Methods: The study included 44 female patients diagnosed with RA. Light touch sensation was measured in eight different areas of the hand (thumb, distal and proximal index finger, middle finger, ring finger, distal and proximal little finger, palm) using Semmes-Weinstein Monofilaments. Pain sensation was assessed using the Sharp-Blunt Test applied to the medial and ulnar nerve dermatomes of the hand; function was assessed using the Moberg Pick-Up Test and the Duru Hand Index.

Results: The age of the patients participating in the study (mean $\pm$ standard deviation) was 52.4318 ± 11.89371 . Decreased light touch sensation according to the Semmes Weinstein sensory classification was observed in eight different regions of the hand. No significant relationship was found between light touch sensation, pain sensation, and the Moberg Pick-Up Test with eyes open ($p > 0.05$). A significant relationship was found between the Moberg Pick-Up Test with eyes closed and light touch sensation, except for the proximal region of the ring finger and little finger. No significant relationship was found between superficial pain sensation and the Moberg Pick-Up Test with eyes closed. A positive, significant relationship was found between light touch sensation and the Duruöz Hand Index, except for the thumb, middle finger, and little finger proximal regions.

Conclusions: The results of our study indicate that light touch sensation may affect hand function. Therefore, considering sensory impairments in RA patients and providing them with the necessary treatments may increase the success of rehabilitation.

A-0611 ULNAR NERVE INJURY IN PEDIATRIC SUPRACONDYLAR HUMERAL FRACTURE - TREATMENT RESULTS OF CASE SERIES

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Introduction: Ulnar nerve injury is a recognized complication of pediatric distal humeral fractures, particularly in flexion-type supracondylar fractures. Iatrogenic injury may also occur during surgical stabilization, especially with medial pinning. The aim of this study was to evaluate clinical outcomes following surgical treatment of post-traumatic and post-operative ulnar nerve neuropathy in pediatric patients with distal humeral fractures.

Methods: This retrospective case series included 10 children (ages 3–16) who underwent surgical treatment for ulnar nerve dysfunction between 2018 and 2024. All patients had sustained a distal humeral fracture: 7 supracondylar, 2 transcondylar, and 1 medial epicondyle avulsion. 6 patients developed neuropathy after trauma, and 4 following surgical stabilization. Surgical treatment consisted of neurolysis alone or combined with anterior subcutaneous transposition; one patient additionally underwent end-to-side nerve transfer, and one neurolysis with anterior interosseous nerve (AIN) transfer to the motor branch of the ulnar nerve. The decision for surgery was based on lack of clinical and ultrasound evidence of nerve regeneration. Preoperative and postoperative sensory and motor function, as well as pain, were assessed using standardized scales.

Results: Surgical procedures were performed at a mean of 6 months after injury. During follow-up, conducted at an average of 5 months postoperatively, nerve regeneration was assessed clinically. All patients showed improvement in motor and sensory function. One patient demonstrated persistent asymptomatic nerve instability. No intraoperative complications were reported. Intraoperative findings included nerve entrapment, flattening, fibrosis, and scarring.

Conclusions: Surgical management of pediatric ulnar nerve injury secondary to humeral fracture or surgical fixation can result in favorable functional outcomes. Timely neurolysis, with or without transposition, may facilitate nerve recovery by reducing compression and improving the regenerative environment. These interventions offer a safe and effective option in cases where spontaneous regeneration does not occur. Level of Evidence: Level IV; retrospective case series.

A-0612 SAUVAGE TREATMENT IN TRAPEZIUM- METACARPAL ARTHROPLASTIES FAILURES

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Introduction: There are some different treatments for trapezium-metacarpal arthritis in stage 2-3 of Eaton-Littler classification.

They are Arthroplasty with trapezium excision, with or without ligament reconstruction (pellegrini-Eaton) or interposition in the empty space of trapezium.

Arthrodesis, endoarthroplasty, Prosthesis replacement.

Unfortunately all these treatments can fail.

Aim: I propose a personal technique to treat these failures.

Material & Methods: In last fourteen years I used in some different cases Reg-joint spacer, a poly-lactid acid biosorbable in ten-twenty months.

I used this spacer to treat trapezium-metacarpal arthrosis (more than 170 cases), seven failure of biological arthroplasties, 4 failure arthrodesis, three prosthesis of trapezio-metacarpal, four cases of Pirodisk spacer failure, one temporary arthrodesis. I always used the spacer with personal technique called "Carrier technique"

I get with specific tool an hole in the center of the spacer, in which put inside a split of flexor radial tendon moved from palmar to dorsal surgery field, maintaining the palmar insertion of the tendon at the base of second metacarpal.

The split of flexor radial carpi pass into the trapezium (when it is present), into the spacer and then into the base and the dorsal part of first metacarpal. And finally the split is fixed under the spacer on the tendon, the remaining part on roll into the space created put in tension the first ray. After the capsule is closed including the APL detaching from the base of first metacarpal.

Results: The use of spacer allows to maintain the high of first ray, solve the conflict with scaffold and rebuilt the dorsal ligament and moving the APL on joint line solve the stability of trapezium-metacarpal.

Conclusions: The reg joint may be a good solution to solve the failures of arthroplasties, its cost doesn't have to be a problem.

A-0613 ULNAR ARTERY-BASED PERFORATOR FLAP FOR THE RECONSTRUCTION OF THE PALM

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Introduction: Reconstruction of the palm remains a significant challenge, particularly in cases requiring revision of the median or ulnar nerve. Local skin flap options in this anatomical region are limited, with the Becker flap being the most commonly employed. However, the Becker flap presents notable drawbacks: its dissection can be complicated by the dorsal branch of the ulnar nerve, and the distal tip of the flap may prove unreliable when rotated over the carpal tunnel. Furthermore, the flap's relative distance from the carpal tunnel limits its versatility.

Aim: Traditionally, the ulnar artery in the distal forearm and wrist has not been considered a reliable source of perforators for soft tissue reconstruction, due to the presumed paucity and variability of its branches.

In this study, we present a clinical series of six consecutive cases in which a distal ulnar artery. In parallel, an anatomical study on six cadaveric specimens was conducted

Material & Methods: Clinical Study: Six patients (four males, two females; mean age 57 years, range 43–70) were included in this series. Five patients underwent multiple median nerve revision procedures, and one patient underwent median nerve reconstruction. All cases required soft tissue reconstruction of the palmar forearm. A palmar ulnar perforator flap was designed and elevated for coverage in each case.

Anatomical Study: Twelve fresh-frozen forearms were injected with red latex to delineate the main arterial pathways. Microsurgical dissection was performed under magnification to identify the palmar ulnar perforators. Perforators were quantified, mapped, and evaluated regarding diameter, course, and vascular territory. All relevant findings were documented with standardized photographic imaging.

Results: Clinically, all of the six flaps were successfully harvested on a distal ulnar artery perforator and survived without any partial or total necrosis. The improvement of neuropathic symptoms varied on an individual basis with an overall favourable outcome.

In the specimens, we found a consistently present perforator from the ulnar artery supplying both skin and fascia in close proximity to the pisiform.

Conclusions: A constant distal ulnar artery perforator was identified and anatomically confirmed. This finding enables a new design option for a distal palmar fasciocutaneous forearm flap. The feasibility of this perforator was demonstrated both in anatomical dissection and in clinical application.

A-0615 USE OF 3D PERSONALIZED IMPLANTS IN THE MANAGEMENT OF HUMERAL BONE DEFECT AFTER CHRONIC INFECTION OF ELBOW JOINT REPLACEMENT ARTHROPLASTY MANAGED WITH A 2-STAGED RECONSTRUCTION

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Introduction: Periprosthetic joint infection after total elbow arthroplasty is an uncommon but highly challenging complication, particularly in patients with inflammatory arthropathies and a history of multiple surgical procedures. It is associated with high failure rates, recurrent loosening, and progressive bone loss. Severe metaphyseal defects of the distal humerus further complicate reconstruction, often limiting the options for stable fixation during revision arthroplasty. Advances in three-dimensional printing have allowed the creation of customized implants that can more precisely adapt to individual bone morphology and to the geometry of bone defects, potentially improving fixation, stability, and functional outcomes in complex revision cases.

Aim: The aim of this report is to describe the management of a chronic periprosthetic elbow infection with a substantial distal humeral bone defect, treated with a two-stage revision procedure using a patient-specific 3D-printed implant designed to restore structural integrity and joint balance.

Material & Methods: A female patient with a history of juvenile inflammatory arthritis and bilateral elbow arthroplasty presented with chronic infection of the right elbow. The primary right prosthesis, implanted in 2004, had undergone multiple revisions for aseptic loosening of the humeral component, ulnar neuropathy, and triceps reattachment. Chronic infection was confirmed in 2017 and was initially managed with suppressive antibiotic therapy.

In 2022, due to progressive pain, local inflammatory signs, and radiological evidence of humeral component failure, a staged revision procedure was planned. The first stage consisted of implant removal and the placement of an antibiotic-loaded cement spacer reinforced with intramedullary fixation (Ender nails). The ulnar component was preserved due to its correct attachment to bone. Microbiological cultures from intraoperative samples isolated *Staphylococcus epidermidis*, and targeted antibiotic therapy was started. Computed tomography showed a severe metaphyseal bone defect of the distal humerus. Based on these findings, a customized titanium implant was designed using 3D printing technology to provide structural support to compensate for the bone loss and to allow a good attachment to the humeral stem. The second-stage surgery was performed in June 2023, with spacer removal and implantation of the patient-specific component. Targeted antibiotic therapy was continued until clinical and blood test parameters were stabilized within 6 months.

Results: At 6 months follow-up, the patient had resumed daily activities without pain or inflammatory signs. At 18-month follow-up, the patient remained pain free and had an adequate range of movement restoration. No evidence of radiographic loosening or recurrence of signs of infection was reported. Functional recovery was satisfactory, with improved range of motion compared to before the 2-staged surgery.

Conclusions: Chronic periprosthetic elbow infection with severe bone loss remains a rare and challenging complication with limited reconstructive options. Three-dimensional printing technology offers an innovative and valuable option for individualized management of large humeral defects in complex revision arthroplasty, enabling precise bone defect

reconstruction and stable implant fixation. This innovative tool, combined with multidisciplinary collaboration and effective infection control, are essential to ensure successful outcomes and restoration of biomechanical balance.

A-0616 A NOVEL DYNAMIC ULTRASOUND METHOD OF MEDIAN NERVE COMPRESSION ASSESSEMENT AT LACERATUS FIBROSUS LEVEL

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Introduction: There are still controversies about how often median nerve compression at the level of laceratus fibrosus does happen and data are questionable. Many do state, that the syndrom is extremely rare. There is need for objective methods to confirm diagnosis. It seems that dynamic ultrasound investigation plus subjective thumb and index finger opposition-flexion test correlate with each other, and are of value compared with typical ultrasound investigation and can be helpful to result in proper diagnosis.

Aim: A proposal of a new dynamic ultrasound method of median nerve investigation at the level of laceratus fibrosus combined with clinical FPL and FDP 2 muscle strength assessment, as much more sensitive method to support presence of nerve compression and dysfunction at the level.

Material & Methods: Ultrasound investigation of 100 nerves in asymptomatic patients without flattening deformity are compared with patients in whom flattening deformity at level of laceratus fibrosus is revealed. Those group of patients are planned to participate in further observation and clinical trials.

Results: The proposed novel method of nerve ultrasound investigations seems to be of great value as diagnostic test for laceratus fibrosus syndrom. The investigation is prospective and wider material should be assessed in longer terms.

Conclusions: Dynamic median nerve ultrasound investigation at the level of laceratus fibrosus seems to be much more sensitive investigation in comparison to traditional ultrasound assessment. It seems, it should help to reveal higher number of patients in whom dysfunction occurs.

A-0618 A PATIENT-SPECIFIC FINGERBREADTH METHOD TO OPTIMIZE SAFE NEEDLE DEPTH AND PREVENT AXILLARY NERVE INJURY DURING INTRADELTOID VACCINATION

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Introduction: Incorrect deltoid intramuscular vaccination can lead to complications such as subdeltoid bursitis, axillary nerve injury, and unintentional subcutaneous injection. Current guidelines commonly use the practitioner's 2–3 fingerbreadths below the acromion as the injection landmark; however, finger size varies widely between individuals, and population-based measurements may not accurately reflect patient-specific anatomy. Using the patient's contralateral individual fingerbreadth provides a more precise and reproducible method for localizing the injection site.

Aim: To determine the appropriate needle penetration depth and assess the risk of axillary nerve proximity during deltoid vaccination using an individualized contralateral fingerbreadth technique.

Material & Methods: This cross-sectional ultrasound study included Thai adults who underwent bilateral shoulder ultrasonography. Measurements were obtained at four conditions: individual 2- and 3-fingerbreadth distances and

average 2- and 3-fingerbreadth distances below the acromion, in both arm-at-side and 60° arm-abduction positions. Skin-to-subcutaneous (SC) thickness, subcutaneous-to-subdeltoid fascia (SM) thickness, and axillary nerve visibility at each site were recorded and compared with needle penetration depths of 0.5 inch and 1 inch. Demographic variables including sex, BMI, age, and exercise patterns were analyzed for correlation with tissue depth.

Results: Eighty-two participants were evaluated. Axillary nerve visibility was absent at the individual 2-fingerbreadth arm-at-side position, indicating the lowest risk. Nerve incidence increased at the individual 3-fingerbreadth arm-at-side location (approximately 31–33%) and was highest at the 3-fingerbreadth arm-abduction position, where the nerve was present in 43.6% of males and 55.8% of females. Average fingerbreadths demonstrated a similar pattern, with minimal nerve detection at 2 fingerbreadths arm-at-side and the highest incidence at 3 fingerbreadths arm-abduction. Females had significantly thicker SC layers than males (7.6 ± 2.7 mm vs 5.5 ± 1.8 mm), whereas males exhibited greater SM thickness (22.2 ± 3.5 mm vs 19.2 ± 4.5 mm). Tissue depth increased with greater fingerbreadth distance and with arm abduction. A 0.5-inch needle penetration achieved intramuscular placement in 100% of cases without overpenetration. Conclusions: The individualized contralateral fingerbreadth method yields a more anatomically accurate and safer landmark than population-average measurements. The 2-fingerbreadth arm-at-side position is the safest injection site, minimizing axillary nerve risk. A 1-inch needle should be inserted only to half its length to avoid overpenetration, or a 0.5-inch needle may be used with full insertion to achieve reliable intramuscular delivery while reducing the risk of shoulder injury.

A-0619 HAND SARCOMA CASE CONFIRMED WITH MRI

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Introduction: Operative treatment of handsarcoma with information given to a patient, that amputation of the hand can be taken into consideration or can be necessity is extremely distressing and can lead to severe depression.

Aim: Anamnesis taken from the patient is basic for whole diagnostic and treatment process. Negligence in taking anamnesis and disinformation of radiologist have resulted in disastrous diagnosis, devastating for the patient.

Material & Methods: A case of rapidly growing hand tumor is presented, where MRI had confirmed suspicion and given diagnosis. Fotos from MR US and tree-splint will be included.

Results: The story has ended with happy end - conversation with the patient under preoperative ultrasound investigation resulted in very different suspicion and diagnosis, which was confirmed under operation:

foreign body In form of tree-splint.

A-0620 A NOVEL DEPTH GAUGE FOR BONE DRILLING

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Introduction: accurate measurement of bone holes depth is essential during osteosynthesis and other bone procedures that require drilling through cortical and cancellous bone. Conventional depth gauges, many of which were originally designed in the 1970s, remain widely used despite limitations related to ergonomics, reliability, and accuracy. Inaccurate depth assessment increases the risk of selecting inappropriate screw lengths, compromising fixation stability and potentially harming surrounding soft tissues.

Objective: To address these challenges, we developed a novel measuring device intended to improve the precision and reproducibility of bone hole depth measurements in orthopaedic surgery.

Materials and Methods: A prototype measuring device was designed and constructed by the authors. Its performance was assessed using eight fresh-frozen cadaveric upper limbs. Four surgeons participated in the study. On each cadaver, twelve measurements were performed: four on the radius, four on the ulna, and four on the third metacarpal. Surgeons measured the depth of each drilled hole using the new device. These measurements were then independently verified using two standard commercial depth gauges to establish reference values. Inter-observer and inter-operator reliability were evaluated. Accuracy was calculated as the absolute difference between the measurement obtained with the new device and the reference value.

Results: The novel device demonstrated high accuracy across all anatomical sites. The overall measurement error was consistently below 1 mm in bicortical bones. Agreement among surgeons and observers showed minimal variability, indicating strong inter-operator and inter-observer consistency. No systematic overestimation or underestimation was observed. Both the radius and ulna demonstrated slightly lower variability compared to the metacarpal measurements, although all values remained within the clinically acceptable error range. When compared with the standard gauges, the new device performed with equal precision while offering improved handling and smoothness of the measurement procedure.

Conclusion: This study introduces a newly developed depth-measuring device intended for orthopaedic drilling procedures. Testing on cadaveric specimens demonstrated sub-millimetric accuracy and reproducibility among surgeons. These findings suggest that the device may represent a valuable improvement over traditional gauges. Further clinical evaluation is needed to confirm its performance in clinical practice.

A-0621 LONG TERM OUTCOMES OF KUDO TYPE TOTAL ELBOW ARTHROPLASTY IN RHEUMATOID ARTHRITIS

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Introduction: Total elbow arthroplasty (TEA) has been used for various conditions including rheumatoid arthritis (RA). While the Kudo TEA has been associated with favorable short-term outcomes, there is limited evidence on the long-term outcome of this device.

Aim: The aim of this study is to investigate the long term outcomes of Kudo type TEA in patients with RA.

Material & Methods: For this retrospective cohort study, we reviewed 36 patients with RA who underwent Kudo type TEA between 1996 and 2007. The patients were followed up for a mean of 24.6 (18-29) years. We investigated the survival with setting revision/removal as the end points.

Results: There was a significant improvement in elbow flexion after Kudo TEA. Preoperative and postoperative Mayo Elbow Performance Score improved significantly from 55 to 83 at 10 year-follow up after operation. Final average MEPS was 68. Aseptic loosening was observed in 5 patients (15.6%; ulna, n=2, both, n=3). Five patients underwent revision TEA due to periprosthetic fracture, metallosis and aseptic loosening. They are converted to Coonrad-Morrey type TEA. The survival rate was 94% at 10 years and 86% at 25 years after surgery with setting revision / removal as the endpoints. **Conclusions:** The Kudo type TEA showed favorable results for up to long-term follow-up in the patients with RA.

A-0622 MINIMALLY INVASIVE WIRELESS ELECTRICAL STIMULATION THROUGH INJECTABLE CONDUCTIVE HYDROGELS FOR ENHANCING PERIPHERAL NERVE REGENERATION IN CHRONIC COMPRESSIVE NEUROPATHY

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Introduction: Chronic compressive neuropathies frequently show incomplete recovery even after adequate surgical decompression. Prolonged compression induces irreversible axonal degeneration and muscle denervation, limiting functional return. Although electrical stimulation has been shown to accelerate axonal regeneration and enhance functional recovery, current clinical applications require direct or implanted electrodes, those are invasive, and often fail to deliver targeted stimulation to small peripheral nerves. To overcome these limitations, we developed a minimally invasive platform that combines an injectable, adhesive, biodegradable conductive hydrogel with remote and wireless radiofrequency (RF) stimulation. The hydrogel incorporates gold nanoparticles, enabling it to generate eddy currents when exposed to high-frequency electromagnetic fields, thereby acting as a temporary, conforming electrode directly over the nerve.

Aim: To determine whether a wireless RF-responsive conductive hydrogel can enhance functional and structural nerve regeneration following decompression in a chronic sciatic nerve compression model in rats.

Material & Methods: A chronic sciatic nerve compression model was created in Sprague–Dawley rats using a silastic tubing method for four weeks. After decompression, animals were randomized into four groups: (1) Decompression Only, (2) Conductive hydrogel Only, (3) RF Only, and (4) Conductive hydrogel + RF. The conductive hydrogel (0.1 mL) was injected to fully coat the decompressed sciatic nerve. RF stimulation was delivered using a custom-designed external RF coil without anesthesia, providing 250 A, 3 pulses/s for 1 hour daily over 7 consecutive days. Functional outcomes were assessed by compound muscle action potential (CMAP) amplitudes and video gait analysis focusing on ankle angle at terminal stance. Structural regeneration was evaluated using histomorphometry at the compression center and distal segments, measuring axon count, fiber diameter, myelin thickness, and G-ratio. Assessments were performed at 3 and 6 weeks after decompression.

Results: Animals in the Conductive hydrogel + RF group consistently demonstrated visible hindlimb muscle twitching during stimulation, confirming effective wireless signal transduction through the conductive hydrogel. At 6 weeks, CMAP amplitudes were significantly higher in the Conductive hydrogel + RF group compared with all other groups ($p < 0.01$), indicating improved electrophysiologic recovery. Gait analysis demonstrated a trend toward improved ankle angle during terminal stance, suggesting enhanced motor coordination. Histologically, the Conductive hydrogel + RF group showed significantly higher axon counts, larger axon and fiber diameters, and thicker myelin compared with the other groups at both 3 and 6 weeks ($p < 0.05$). Notably, these improvements were observed not only at the compression center but also in distal nerve segments, indicating more robust and sustained axonal regeneration.

Conclusions: Wireless RF stimulation delivered through a biodegradable, injectable conductive hydrogel significantly enhances both functional and structural nerve regeneration after chronic compressive neuropathy. This platform enables targeted, sustained neural stimulation without the need for implanted hardware, offering a promising minimally invasive and clinically translatable adjunct therapy for peripheral nerve injuries.

A-0623 TRIGGER FINGER: EPIDEMIOLOGICAL CHARACTERISTICS AND NECESSITY OF SURGICAL TREATMENT

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Introduction: Trigger finger, or stenosing tenosynovitis is caused by mechanical impingement of flexor tendon usually at the A1 pulley (less often the A2 or A3 pulley) level, resulting in functional impairment due to pain, clicking, catching and locking sensation of the digit. It affects around 3% of the population aged over 30 years, more frequently women and often requires surgical release.

Aim: The aim of our study was to evaluate the prevalence, clinical characteristics and severity of trigger finger symptoms, the percentage of patients seeking medical advice, the effectiveness of conservative treatment options and the necessity of operative management.

Material & Methods: We conducted a cross-sectional descriptive study using a peer-reviewed 16-point structured questionnaire to assess the prevalence, characteristics and management of trigger finger among the general population in Larissa, Greece from March 2025 till October 2025. All participants were interviewed by a trained physician.

Results: A total of 1,249 participants were included in the study (51.4% female, 48.6% male, mean age 48.2 years). At the time of the interview, 28.3% (n=363) of them recalled having experienced minor symptoms of finger pain and/or catching with incomplete clinical presentation for a brief duration. Only 5.7% of the respondents (n=71) reported a clear history of trigger finger with 177 (40.8%) of them being manual laborers. The dominant hand was most often involved and particularly the ring finger, followed by the middle finger and the thumb. Nine out of 71 patients reported a history of previous operative intervention, including CTS release, distal radius ORIF, CMC I arthroplasty and trigger finger release of an adjacent finger on the ipsilateral upper limb. Thirty-nine patients (54.9%) reported remission of symptoms after inconsistent conservative treatment and eight patients (11.2%) received consistent oral analgesic and NSAID therapy. Among patients managed non-operatively, 72.3% (n=34) experienced symptom remission after at least two months. Only 33.8% (n=24) were treated operatively, with 70.8% (n=17) of them after a period of at least 5-6 months of symptoms. Complete symptom remission was reported by 83.3% of them (n=20) and no postoperative complications were recorded. Nineteen of the surgically treated patients (79.2%) would choose surgical treatment again, while 32 (69.1%) of those conservatively treated would still prefer non-operative management.

Conclusions: Our findings suggest that conservative treatment (often inconsistent) results in symptom resolution, often after a two-month period for most patients and is accompanied by a high level of reported satisfaction. Moreover, most patients were willing to defer surgical release for at least 5-6 months.

A-0625 REOPERATIONS FOR THORACIC OUTLET SYNDROME: CAUSES AND CLINICAL OUTCOMES IN SIX CASES

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Introduction: Reoperations for thoracic outlet syndrome (TOS) are rarely reported, and the underlying causes of symptom persistence as well as postoperative outcomes remain unclear. Clarifying the indications and outcomes of re-operations is therefore important for optimizing surgical strategies and improving patient prognosis.

Aim: This study aimed to elucidate the causes leading to re-operation for TOS and to assess surgical approaches and postoperative outcomes in patients who underwent re-operation for TOS.

Material & Methods: We retrospectively reviewed six patients (mean age, 40 years; four women and two men) who underwent reoperation for TOS at our institution. Data were collected on the cause of symptom persistence, surgical approach, and pre- and postoperative outcomes using the visual analog scale (VAS) for pain, Disabilities of the Arm, Shoulder, and Hand (DASH) score, and Derkash functional grading. The site of the primary operation and the interval between surgeries were also examined.

Results: Causes of persistent or recurrent symptoms included residual first rib and scalene muscles in one case, persistent compression at the pectoralis minor region in two, fibrous tissue compression unrelated to the scalene muscles in one, and subclavian vein stenosis in one. Primary surgical approaches comprised axillary (three cases), supraclavicular (one), infraclavicular (one), and combined supraclavicular–axillary (one). Reoperations were performed via infraclavicular (three), supraclavicular (two), and combined supraclavicular–infraclavicular (one) approaches. Pectoralis minor tenotomy was performed in four cases, and direct neurolysis in two.

Conclusions: The mean VAS score improved from 70 (60–80) to 40 (0–70), and the mean DASH score improved from 65 (42–81) to 39 (12–70) after revision surgery. According to the Derkash classification, outcomes before revision surgery were “fair” in five patients and “poor” in one patient. After revision surgery, the results were “excellent” in one patient, “good” in two patients, and “fair” in three patients. The two patients with excellent or good outcomes had insufficient decompression during the primary surgery, whereas the three patients with fair outcomes had undergone first-rib resection and anterior/middle scalenotomy at the initial operation.

A-0627 USABILITY AND FUNCTIONAL PERFORMANCE OF A CONVERSATIONAL NERVE TRANSFER COMPANION CHATBOT FOR PERIPHERAL NERVE SURGEONS:

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Introduction: Complex decision-making in peripheral nerve reconstruction relies on timely synthesis of anatomy, deficit chronology, donor availability, and rehabilitation constraints. Variability in training exposure and limited access to subspecialist consultation can delay optimal nerve transfer planning. Conversational AI tailored to nerve injury workflows may support rapid, standardised planning and education; however, its usability, functional coverage, and safety for surgical decision support require formal evaluation.

Aim: To assess the usability, perceived usefulness, and functional performance of a nerve transfer companion chatbot among peripheral nerve surgeons and trainees, with attention to decision concordance and safety.

Material & Methods: Design and setting: Single-centre, prospective, mixed-methods study in a simulation environment using case-based scenarios (e.g., upper trunk palsy; spinal accessory→suprascapular; high ulnar/median; radial palsy; delayed cases needing tendon vs nerve strategies).

Participants: Peripheral nerve surgeons (consultants/attendings), fellows, and senior residents on brachial plexus/peripheral nerve services. Inclusion: ≥18 years, English fluent. Exclusion: prior formal chatbot design/testing.

Intervention and tasks: Participants use the chatbot to complete role-relevant tasks: problem representation; donor–recipient matching; timing; graft vs transfer selection; coaptation site planning; documentation scaffolds (op plan, consent points); intraoperative troubleshooting; early rehab milestones.

Outcomes: Primary—System Usability Scale (SUS). Secondary—(1) task success vs prespecified criteria; (2) decision

concordance to expert checklists (Cohen's kappa, acceptable variance); (3) time-on-task; (4) workload (NASA-TLX); (5) usefulness (UMUX-Lite) and intention to use; (6) safety signals (hallucinations, inappropriate recommendations, missed contraindications/rehab constraints); (7) functional coverage (proportion of scenarios with actionable, guideline-concordant pathways).

Procedures: After consent/orientation, participants provide demographics/experience, manage scripted cases on individual devices, and have interactions timestamped. Blinded faculty adjudicate outputs. Post-session, participants complete SUS, UMUX-Lite, NASA-TLX and a brief interview; qualitative data undergo rapid thematic analysis.

Analysis and sample size: Outcomes summarised overall/by experience; group differences via ANOVA/Kruskal–Wallis; McNemar for error profiles. Pragmatic $n \approx 45$ (15/group) targets acceptable precision for mean SUS and concordance. Missing-data handling is predefined. No patient data; minimal-risk with institutional approval; conflicts disclosed.

Results: Primary outcome is mean SUS and the proportion meeting a priori usability benchmarks. Secondary outcomes include decision concordance, task success, time-on-task, workload, perceived usefulness, safety signals, and functional coverage, stratified by experience level. Feasibility metrics (recruitment, completion, data capture) and qualitative themes will inform iterative refinement and future clinical validation.

Conclusions: This mixed-methods evaluation will assess whether a conversational nerve-transfer companion attains acceptable usability (SUS) with high decision concordance to expert standards while surfacing safety signals and functional-coverage gaps. If benchmarks are met, the tool could help standardise planning and education in peripheral nerve reconstruction and inform a subsequent clinical-validation phase.

A-0628 CLINICAL OUTCOMES AND POSTOPERATIVE ULNAR NEUROPATHY FOLLOWING TWO ULNAR NERVE MANAGEMENT STRATEGIES IN PARATRICIPITAL FIXATION OF LOW TRANSCONDYLAR DISTAL HUMERUS FRACTURES

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Introduction: Low transcondylar distal humerus fractures in older adults are characterized by a transverse extra-articular and intracapsular fracture line and are commonly treated with open reduction and internal fixation in displaced cases. Although distal in location, these fractures can be accessed using the paratricipital approach. Optimal ulnar nerve management during distal humerus surgery remains controversial.

Aim: To compare clinical outcomes and postoperative ulnar neuropathy between two different ulnar nerve management strategies—in-situ decompression versus no decompression/no mobilization (NDNM)—during paratricipital fixation of low transcondylar distal humerus fractures.

Material & Methods: Between 2017 and 2022, 42 patients underwent parallel plating through a paratricipital approach for low transcondylar distal humerus fractures. Group 1 ($n = 26$) received in-situ decompression (decompression and mobilization without transposition), whereas Group 2 ($n = 16$) underwent NDNM. No patient had preoperative ulnar nerve symptoms. Postoperative clinical outcomes, elbow range of motion (ROM), radiographic union, delayed union, nonunion, and heterotopic ossification (HO) were evaluated. Ulnar neuropathy was assessed using the McGowan classification, and recovery was documented.

Results: The mean age was 73 ± 11.3 years in Group 1 and 70 ± 13.2 years in Group 2 ($P = 0.70$). Mean follow-up was 14 months in Group 1 and 12 months in Group 2. Final elbow ROM averaged 110° (range, 80 – 120) in Group 1 and 115° (range, 90 – 125°) in Group 2 ($P = 0.32$). All fractures united, with mean union times of 5.5 months (Group 1) and 5 months (Group 2). Delayed union occurred in four patients in Group 1, and HO occurred in two patients without functional limitation.

Immediate postoperative ulnar neuropathy developed in 6 patients (23%) in Group 1 versus 1 patient (6%) in Group 2 ($P < 0.05$). Neuropathy grades in Group 1 were McGowan I ($n=3$) and IIa ($n=3$); in Group 2, the single case was grade I. Most neuropathies resolved by final follow-up.

Conclusions: Clinical outcomes were similar between groups; however, the NDNM strategy resulted in a significantly lower incidence and milder severity of postoperative ulnar neuropathy. Avoiding routine decompression and mobilization of the ulnar nerve during paratricipital fixation may reduce traction-related iatrogenic neuropathy in low transcondylar distal humerus fractures.

A-0629 DOES EARLY VERSUS LATE SUBCUTANEOUS TRANSPOSITION OF THE ULNAR NERVE DURING OLECRANON OSTEOTOMY FOR DISTAL HUMERUS FRACTURES AFFECT POSTOPERATIVE ULNAR NEUROPATHY?

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Introduction: Ulnar nerve management during surgical treatment of distal humerus fractures remains controversial. Although meta-analyses report no definitive advantage of subcutaneous transposition over in situ decompression, many surgeons continue to prefer anterior transposition—particularly when performing olecranon osteotomy for intra-articular distal humerus fractures. In these cases, the timing of transposition during the procedure may influence the risk of postoperative neuropathy.

Aim: To compare the incidence and severity of postoperative ulnar neuropathy between early and late subcutaneous ulnar nerve transposition performed during open reduction and internal fixation (ORIF) of intra-articular distal humerus fractures.

Material & Methods: Between 2015 and 2021, 38 patients with intra-articular distal humerus fractures underwent ORIF via an olecranon osteotomy approach at our institution. All patients received subcutaneous ulnar nerve transposition, and none had preoperative ulnar nerve symptoms. Patients were divided into two groups based on timing of transposition: early versus late. Postoperative ulnar neuropathy was assessed using the McGowan classification, and recovery patterns were recorded.

Results: Eighteen patients underwent early transposition and 20 underwent late transposition. Mean age was 66 ± 11 years in the early group and 68 ± 13.2 years in the late group ($P = 0.7$). Fracture patterns (AO/OTA classification) were similar between groups: C1 (8), C2 (6), and C3 (4) in the early group vs. C1 (10), C2 (5), and C3 (5) in the late group ($P = 0.8$). Immediate postoperative ulnar neuropathy occurred in 4 patients (22%) in the early group and 10 patients (50%) in the late group ($P = 0.028$). All early cases were McGowan grade I. In the late group, neuropathy severity included grade I ($n=5$), grade IIa ($n=3$), and grade IIb ($n=2$). All early-group neuropathies resolved by a mean of 3.6 months. In the late group, 8 of 10 neuropathies recovered—five grade I and three grade IIa—over a mean of 12.7 months.

Conclusions: Late subcutaneous transposition of the ulnar nerve was associated with both a higher incidence and increased severity of postoperative ulnar neuropathy compared with early transposition. When subcutaneous transposition is selected for ulnar nerve management during olecranon osteotomy for distal humerus fractures, performing the transposition early in the procedure may reduce iatrogenic traction-related neuropathy.

A-0631 OPTIMIZATION OF 3D-PRINTED INDIVIDUALIZED BONE SPECIMENS FOR BIOMECHANICAL TESTING

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Introduction: Although artificial bones (e.g., Sawbones) are easy to handle and less expensive than cadaver bones, they do not reproduce the unique internal structure and viscoelastic properties of real human bone. After creating a digital 3D model of the metacarpal bone, we developed two individualized artificial bones using additive manufacturing (3D-IB). **Aim:** The aim of the study was to develop individualized artificial bones using 3D printing (additive manufacturing) and to evaluate their biomechanical similarity to conventional artificial bones (Sawbones) and real human bone. Specifically, the research investigates whether these custom 3D-printed bones better replicate the unique internal structure and viscoelastic properties of human bone, by subjecting them to various mechanical loadings and comparing the results to those of standard Sawbones and cadaver specimens.

Material & Methods: Based on CT datasets from freshly frozen, macroscopically intact metacarpal cadaver bones (MC 2-5), we designed digital templates with three layers in standard tessellation language (STL) meshes to meet 3D printer specifications. We used Polyamide 12 (PA12) as the base material. Several 3D-IB variants were developed:

1. Specimens with horizontally arranged lamellar structure as in types 1–3 (PA12H)
2. Full 3D bone from PA12 material with addition of mineral fibers
3. Description possibly missing
4. Description possibly missing
5. Cortical bone as thick as measured by CT, cancellous bone with an architecture of 1.2 mm pores (PA12V)
6. Cortical bone thickened by 0.5 mm with an identical architecture as specimen 1 for the cancellous bone (PA12V+)

Bone templates were equipped with reinforcing clamps at both ends for testing. Testing for torsion, tension, bending, and shear was performed using a custom-designed apparatus, applying forces at 5 mm/min. All 3D-IB metacarpal variants were compared to Sawbones and freshly frozen cadaver bones, and all specimens were loaded to failure.

Results: A total of 44 specimens were tested, of which 25 were 3D IB metacarpals. The mean maximum load in Newtons N for torsion in the human specimen was 228.20, the base version 3D-IB PA12 showed a mean of 225.86, and the Sawbone revealed a mean of 622.7. In the tensile test, the maximum force in the human specimen was 1814.70 N, the base version 3D-IB PA12 showed a mean of 1446.42 N, and the Sawbone showed a mean of 3061.80 N. In shear, the base version 3D-IB also showed a force value comparable to the human specimen at 1814.70 N, while the Sawbone showed a mean of 3061.80 N. The average maximum load for bending in the human specimen was 1814.70 N, the base version 3D-IB PA12 showed a mean of 1446.42 N, and the Sawbone showed a mean of 3061.80 N. Here, the PA12+ specimen was comparable to the human specimen.

Conclusions: 3D IB showed a significantly higher similarity in the force curves, in the types of loading we conducted, to the cadaver bones. The Sawbone bones differ significantly from freshly frozen human bones in their mechanical properties and are, in our view, not optimal for this purpose. Testing of further variants of the 3D IB should lead to the development of an optimal substitute for human bone in biomechanical testing.

A-0632 MCT-ANALYSIS OF THE MORPHOLOGICAL LOOSENING BEHAVIOR OF COMPRESSION SCREWS IN HUMAN SCAPHOIDS UNDER CYCLIC BENDING LOAD - AN IN VITRO STUDY

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Introduction: Scaphoid fractures represent the most frequent wrist fracture, predominantly affecting young, active individuals. Headless compression screws have revolutionized surgical treatment by delivering stable fixation through variable thread pitches; however, a comprehensive understanding of bone-implant interface (BII) dynamics and screw loosening behavior under cyclic loading remains elusive. Addressing these knowledge gaps is critical for optimizing implant design and ensuring durable osteosynthesis in clinical practice.

Aim: This in vitro study seeks to define: (1) whether micro-CT assessment can effectively differentiate morphological alterations in bone volume and density surrounding various compression screws used in scaphoid fractures; and (2) whether screw type significantly influences loosening behavior at the BII under cyclic bending load, accounting for bone density as a covariate.

Material & Methods: Forty-eight human cadaveric forearm specimens were acquired, with Herbert B2-type scaphoid fractures created iatrogenically. Specimens were randomly assigned to receive one of four screw types: Synthes HCS 3.0 mm long thread (SH), KLS Martin HBS2 midi short thread (KH), Acutrak 2 Mini (AA), and Stryker TwinFix 3.2 mm (ST). Each scaphoid underwent 2,000 cycles of bending load under near in-vivo conditions, followed by micro-CT examination pre- and post-loading. Bone density, ratio of object volume (OV) to total volume (TV), and other morphometric parameters were measured within a defined cylindrical region-of-interest (ROI) around the implant using ImageJ software. Univariate and ANOVA statistical analyses were performed to assess effects of implant type and bone density on OV/TV ratios and loosening outcomes.

Results: Of the 48 scaphoids, 28 were evaluated by micro-CT; specimens covered a broad age and bone density spectrum (mean: 469.8 HU). Micro-CT revealed statistically significant correlations between bone density and OV/TV ratio both pre- and post-loading ($p = 0.011$, $p = 0.024$), underscoring the method's sensitivity for distinguishing morphological change. After correction for bone density, marked differences in loosening were evident between screw models: the Acutrak 2 Mini (AA) exhibited superior performance compared to KLS Martin HBS2 (KH) and Stryker TwinFix (ST) screws after loading ($p = 0.034$, $p = 0.004$). Screws featuring continuous threads and conical shapes demonstrated improved primary stability outcomes.

Conclusions: This biomechanical in vitro study advances understanding of scaphoid fracture osteosynthesis and bone-implant interface mechanisms. Micro-CT analysis enables precise differentiation of morphological changes around implants and highlights the significant role of bone density in screw loosening behavior. For future implant design, continuous-thread, conical screws emerge as favorable for stable BII formation, although clinical validation remains necessary. The implications for selecting optimal fixation devices and design features warrant additional studies and translation to clinical practice.

A-0633 EPIDEMIOLOGY AND PREVENTION OF INJURIES TO THE HAND AND WRIST IN REGULAR SPORTING PARTICIPANTS

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Introduction: The majority of sporting fractures (59%) are to the hand and wrist (Court-Brown, 2008), with a variety of preventative measures available to participants including gloves, wristguards, fingertape, pre-strengthening, bone density optimisation, technique and adequate recovery. No published data have previously been available to determine which sports place regular participants at greatest risk of injury. The mild-moderate hand and wrist injuries typical in sport prevent return to work for a mean of 30 days (Urso-Baiarda, 2008) with longer delays and ongoing impairment in return to sport.

Aim: Determine which sports place regular participants at greatest risk of injury and which areas of the hand are at risk
Material & Methods: 5000 hand and wrist injury attendances at a single UK major trauma centre A&E by adults aged >16 between 2019 and 2024 (excluding 2020-2021 pandemic years) were retrospectively analysed by two independent orthopaedic trainees. 1170 of these bony and soft tissue injuries (23%) were as a result of participation in competitive athletic sporting activity. These data were stratified by specific sport and analysed in tandem with the SportEngland participation datasets. The risk to hand & wrist posed by participation in a given sport was assessed by calculating the number of regular twice-monthly participants required in a typical year for one to be sufficiently harmed to attend A&E. This determined the number needed to harm 'NNH' or number needed to have one operation 'NNO'.

Results: Roller and skating sports were the most dangerous in the UK context for hand & wrist injury (NNH = 72, NNO = 723), followed by rugby (NNH = 78, NNO = 588), cricket (NNH = 142, NNO = 1235), equestrian (NNH = 156, NNO = 912), netball (NNH = 174), field hockey (NNH = 175, NNO = 1093), soccer (NNH = 177, NNO ~ 1800), volleyball (NNH = 231), and skiing and snowboarding (NNH = 298, NNO = 2203). The safest sports for the hand and wrist were swimming (NNH ~13,000), fitness classes or gym training (NNH ~ 5,764, NNO ~ 65,000) and running/athletics/multisports (NNH ~ 4,500, NNO ~130,000). The wrist and distal radius were at greatest risk in skating and snowsports, whereas the fingers were at greatest risk in ball sports.

Conclusions: Patterns from stratification by digit and AO domain of hand/wrist injury enable recommendations for sport-specific injury prevention.

A-0634 QUANTITATIVE ASSESSMENT AND VISUALIZATION OF MICROSURGICAL SKILLS USING AI-BASED BEHAVIORAL ANALYSIS

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Surgical procedures require highly precise and delicate manipulation, and they have traditionally been learned mainly through apprenticeship-based experiential training. However, this method imposes significant time and workload demands, lacks reproducibility and objectivity, and inevitably creates a heavy teaching burden on expert surgeons and subjective skill assessments. These limitations are increasingly seen as barriers to expanding high-quality training and systematically implementing competency-based curricula. Recent advances in artificial intelligence (AI) have enabled quantitative analysis and objective evaluation of surgical techniques, with applications reported across multiple clinical

areas including laparoscopic, robotic, and endoscopic surgery. In the field of microsurgery, technology for skill assessment using image analysis, eye-tracking, and motion analysis is also emerging. Notably, the widespread use of digital microscopes and exoscopes is providing an environment where high-resolution operative videos, recorded in routine clinical or simulated settings, can be stored as data and analyzed systematically. Additionally, methods that were traditionally costly, such as eye-tracking and motion capture, can now be performed quickly and at relatively low cost by utilizing AI-based algorithms and commercially available devices.

In response, we are developing an interactive training platform that combines these technologies and employs AI-based behavioral analytics. Our system automatically scores microscopic surgical videos based on nine predefined evaluation criteria, including instrument handling, motion efficiency, field awareness, and tissue respect, offering learners scored feedback along with explanatory comments and suggestions for improvement. This feedback is delivered through a web-based interface that enables trainees to review their performance repeatedly and monitor long-term changes in their scores. Currently, 60 trainees from six institutions are enrolled, and a dataset of 1,695 scenes of microscopic surgical procedures has been assembled for ongoing analysis and model optimization. Furthermore, we are integrating forearm electromyography, recorded with a cuff-type EMG device, alongside gaze data to develop models that assess surgical proficiency through combined indices of kinematics, visual attention, and muscle activity. By correlating these multimodal measurements with expert ratings and training history, we aim to detect subtle differences in technique that may not be visible upon visual review and to identify characteristic patterns associated with various levels of expertise.

A-0635 CURRENT STATUS AND DIVERSITY OF EXTENSOR TENDON REPAIRS IN COUNTRIES OF EUROPE AND ASIA

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Introduction: It is a long-held impression that extensor tendon repair methods and therapies are very diverse. However, no survey has been done to know exact differences and current status.

Aim: The purpose of this study is to sample 30 attending hand surgeons (from 3 countries) to answer these questions.

Material & Methods: Ten attendings from each country were asked to answer questionnaires in the format of multiple choices questions regarding their extensor tendon repair surgery and therapy.

Differences in the methods are analyzed.

Results: The survey reveal huge diversity among all questions surveyed. None of any two attendings gave same answers.

Conclusions: Guidelines and recommendations from an international expert panel was published in 2025 October issue of Journal of Hand Surgery-European. This international survey confirms a large diversity in the methods of surgery and therapy after extensor tendon injuries as well as obvious discrepancies of status of extensor repair in real-world from guidelines and recommendations. Of note, only a small percentage of the hand surgeons use a robust 6-strand repair for the EDC repair, and early active motion after EPL repair is uncommonly used. The results indicate many real-world practice methods in extensor tendon repairs needs considerable updates.

A-0636 EXPLORING EXPERIENCES OF PATIENTS WITH SPASTICITY UNDERGOING UPPER LIMB SURGERY: A QUALITATIVE STUDY

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Introduction and Aims: This study aimed to explore the lived experiences of individuals with upper limb spasticity who underwent surgery to improve hand function. By examining patients' motivations, expectations, and post-operative reflections, we sought to gain insights that could inform clinical decision-making and support services.

Methods: A qualitative design was employed using semi-structured interviews with patients who had undergone hand surgery to improve function for spasticity caused by a variety of aetiologies. Participants were recruited from a single tertiary-referral centre. Interviews were analysed using thematic analysis to identify key themes related to the surgical experience.

Results: Ten participants (4 male, 6 female; aged 24–62 years) took part in the study. Analysis revealed four major themes:

1. Independence—participants pursued surgery to regain autonomy in daily activities;
2. Navigating uncertainty—understanding of surgical options and expectations were variable;
3. Emotional impact—participants reported a mix of hope, anxiety, and determination pre-surgery, and emotional adjustment post-surgery; and
4.) Daily life after surgery—most reported improved function and quality of life. Most valued shared decision-making during recovery.

Conclusions: Patients with spasticity view hand surgery as a potential means to reclaim function and independence. Their experiences are shaped by complex emotional, informational, and rehabilitative factors. Incorporating patient perspectives can enhance shared decision-making and optimise outcomes in upper limb reconstructive surgery.

A-0637 IMPACT OF SCAPHOID INTRAOSSEOUS ROTATION ANGLE ON ITS KINEMATICS

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Introduction: The wrist exhibits three-dimensional motion through flexion/extension, radioulnar deviation, and pronation/supination, facilitated by the coordinated movement of eight carpal bones. The scaphoid exhibits distinctive morphological and kinematic characteristics, namely a twisted morphology and out-of-plane flexion–extension during wrist radioulnar deviation. We hypothesized that this twisted morphology underlies the scaphoid's out-of-plane motion.

Aim: The aim of this study was to investigate the relationship between scaphoid morphology and kinematics.

Material & Methods: We analyzed three-dimensional models constructed from CT data of fourteen fresh-frozen cadaveric forearms (mean age 86.4 years) using METASEQUOIA4 (Tetraface Inc.). We established standardized scaphoid models referencing the scapholunate joint and scaphotrapezio-trapezoidal joint space. Measurements included circumferences of the tubercle, waist, and dorsal tubercle regions. The intraosseous rotation angle was defined as the angle between normal vectors of the scapholunate and trapezio-trapezoidal articular surfaces. Sequential CT scans were obtained at 5-degree intervals from 20 degrees ulnar deviation to 15 degrees radial deviation to investigate the correlation between scaphoid morphology and kinematics.

Results: The circumferential measurements were as follows: tubercle 41.2mm (range 29.4-51.9), waist 36.5mm (range

29.0–43.6), and dorsal tubercle 43.7mm (range 33.4–49.6). The mean intraosseous rotation angle was 59.3 degrees (range 49–69.5). During radioulnar deviation from 20 degrees ulnar to 15 degrees radial, the mean palmar translation of the scaphoid tubercle was 3.18mm (range 0.71–7.2). A strong correlation ($r=0.53$) was demonstrated between the intraosseous rotation angle and the magnitude of volar translation of the scaphoid tubercle.

Conclusions: Scaphoid morphology varied among wrists. Scaphoids with lower intraosseous rotation tended to exhibit greater palmar flexion during wrist radioulnar deviation.

A-0638 THREE-DIMENSIONAL MOTION ANALYSIS OF THUMB PRONATION USING AN OPTICAL MOTION CAPTURE SYSTEM: A COMPARATIVE STUDY WITH THE KAPANDJI SCORE

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Introduction & Aim: The Kapandji score is widely used as a clinical method to assess thumb opposition. Previous studies investigating its relationship with thumb pronation angle have relied on indirect endpoints rather than accurate angular measurements, largely due to limitations in measurement techniques. Optical motion capture (MoCap) allows precise assessment of segmental rotation beyond the metacarpal level, potentially enabling a more accurate quantification of thumb pronation. The purpose of this study was to measure thumb pronation angles at each Kapandji score level using a three-dimensional MoCap system and to evaluate the correlation between the two variables.

Material & Methods: Five hands of healthy adults (three males and two females; median age 35 years, range 33–44) were examined. Thumb pronation angle was defined as the angle between the plane formed by the dorsal surfaces of the second and third metacarpals and the plane of the thumb nail plate. Using a VICON optical MoCap system (Oxford Metrics, UK), thumb pronation was recorded three times for each Kapandji score level from 1 through 10. The average angle for each score was calculated, and the association between Kapandji score and pronation angle was analyzed using Spearman's rank correlation coefficient.

Results: The mean pronation angles corresponding to Kapandji scores 1 to 10 were as follows: score 1, 80°; score 2, 78°; score 3, 82°; score 4, 88°; score 5, 78°; score 6, 83°; score 7, 98°; score 8, 100°; score 9, 115°; and score 10, 125°. A significant positive correlation was observed between Kapandji score and thumb pronation angle. Although previous reports have suggested a ceiling effect—namely, that pronation does not increase proportionally at higher Kapandji levels—our results demonstrated a gradual increase without such a plateau within the measured range.

Discussion: Compared with previously published data, the pronation angles obtained in this study tended to be larger. This may indicate that rotation occurring at the metacarpophalangeal (MP) and interphalangeal (IP) joints contributes to overall thumb pronation, rather than pronation being determined solely by carpometacarpal (CMC) joint rotation. The MoCap-based definition used in this study captures composite rotational components across multiple joints, which may help explain the greater angular values observed relative to earlier studies employing simpler measurement techniques or surrogate endpoints.

Conclusion: Thumb pronation angles measured with an optical MoCap system showed a positive correlation with Kapandji scores across all stages. These findings suggest that the Kapandji score is a valid clinical indicator of thumb pronation angle. MoCap-based measurement may offer a more comprehensive evaluation of rotational thumb movement and could serve as a useful tool for future biomechanical and clinical investigations.

A-0639 EFFICACY OF SENSORIMOTOR REHABILITATION IN A PROFESSIONAL GUITARIST WITH JOINT PAIN DUE TO FAULTY PLAYING TECHNIQUE ON A HYPERMOBILITY BACKGROUND: A CASE STUDY

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Introduction: Playing-related musculoskeletal disorders (PRMDs) are common among musicians. Joint hypermobility is a connective tissue disorder that can lead to proprioceptive deficits. Impaired sensory feedback disrupts the sensorimotor balance, causing musicians to develop faulty compensatory strategies, such as using incorrect joint positions to maintain performance demands, predisposing them to musculoskeletal injuries.

Aim: To present the effectiveness of a sensorimotor rehabilitation and motor learning-based program designed to restore neuromuscular balance in a professional guitarist who developed symptoms (pain, instability) related to faulty technique on a background of joint hypermobility.

Material & Methods: A 40-year-old male professional guitarist (20 years) and graphic designer presented with progressive pain/instability in the left 3rd/4th distal interphalangeal joints. Evaluation revealed hypermobility, impaired joint position sense (JPS), and a distal interphalangeal hyperextension pattern during performance. Baseline assessments included the Visual Analog Scale (VAS), JPS (goniometer), the MPIIQM, and the QuickDASH questionnaire. A six-week (2x/week) sensorimotor rehabilitation program was administered. Proprioceptive training focused on JPS target-matching and dynamic stabilization. Movement re-education employed mirror/video feedback and "stop-think-correct" cognitive strategies. Supportive interventions included lumbrical activation to balance intrinsic-extrinsic muscle forces, wrist stabilization, figure-of-eight elastic taping during playing, and prefabricated ring orthoses for computer use. Ergonomic advice and a home program were provided.

Results: After six weeks of intervention, reassessment showed decreased pain (VAS) and improved joint position sense approaching normal levels. Functional outcomes (QuickDASH and MPIIQM) demonstrated notable improvement.

Conclusions: The findings highlight the effectiveness of proprioception-focused sensorimotor rehabilitation in musicians with pain related to hypermobility. Alongside objective improvements in proprioceptive accuracy, enhanced playing technique and functional performance support the success of this approach. Sensorimotor training and cognitive retraining appear effective in breaking maladaptive compensatory mechanisms by restoring this sensorimotor balance, improving functionality, and enhancing instrument control in hypermobile musicians.

A-0643 ORTHOPLASTIC MINDSET FOR SEVERE POSTBURN CONTRACTURE RECONSTRUCTION

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Introduction: Severe postburn contractures of the upper extremity involve multiple tissue layers and remain among the most complex challenges in reconstructive surgery. The orthoplastic approach, which integrates plastic and orthopedic principles, emphasizes functional stability and coordinated restoration rather than isolated correction of deformities.

Aim: The primary objective of this study is to describe the clinical outcomes of postburn hand reconstructions performed by two hand surgeons over the past five years. These reconstructions were performed with an orthoplastic approach, which allows for more individualized surgical planning and contributes to better outcomes, both functionally and aesthetically.

Material & Methods: A retrospective analysis was performed on 11 patients who underwent postburn contracture

reconstruction by two hand surgeons between January 2021 and September 2025. Patients with severe postburn contracture were included. Preoperative and postoperative clinical photographs, video recordings, and radiological images were retrospectively reviewed. Outcomes were assessed using a five-point Likert scale and review of pre- and postoperative photographs and videos.

Results: The mean patient age was 41.1 years (range, 29–57). Procedures included contracture release, tendon transfer, arthrodesis, flap coverage, pollicization, neurolysis, and amputation where indicated. Across 13 operative sessions, 48 procedures were performed. The mean Likert satisfaction score improved from 1.36 preoperatively to 4.36 postoperatively. Most patients achieved improved functional stability and aesthetic outcomes. Functional gains were modest in some long-standing deformities, yet overall hand utility and patient satisfaction increased substantially.

Conclusions: Reconstruction of severe postburn contractures requires a mindset of functional stability rather than technical correction. An orthoplastic perspective that views the hand as a unified functional system enables individualized planning and durable recovery. The hand surgeon, trained at the intersection of orthopedic and plastic surgery, is uniquely positioned to restore the coordinated performance and functional stability of the upper extremity.

A-0645 KINESIOPHOBIA AND EXERCISE HABITS AS DETERMINANTS OF DISABILITY AFTER PERIPHERAL NERVE INJURY AND FRACTURE

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Introduction: Upper-extremity disability after trauma is usually attributed to structural impairment, but also multiple factors can substantially modify patient-reported function. Whether the relative contribution of these factors differs between peripheral nerve lesions and fractures is unclear. Clarifying shared versus pathology-specific determinants of disability may guide targeted rehabilitation.

Aim: To identify clinical and psychological factors associated with upper-extremity disability in patients with peripheral nerve injuries and fractures, and to test whether these associations differ between the two diagnostic groups.

Material & Methods: In this cross-sectional analysis, adults with upper-extremity pathology were classified into three diagnostic groups: soft-tissue lesions, peripheral nerve injuries, and fractures. The present study focused on the peripheral nerve and fracture cohorts (n=41 and n=40, respectively). Disability was assessed with the DASH. Candidate determinants were kinesiophobia (Tampa Scale), anxiety and depression (Hospital Anxiety and Depression Scale subscales), activity-related pain, grip strength, lateral and tripod pinch strength, age, sex, education level, and habitual exercise. Groups were pooled, and a multiple linear regression model was fitted with DASH as the dependent variable, diagnostic group (peripheral nerve vs fracture) as a binary factor, and all candidate determinants entered simultaneously. Group-by-predictor interaction terms were included to test differential effects between nerve and fracture cohorts. Robust (HC3) standard errors were used. Missing data were handled with complete-case analysis.

Results: In the combined sample, the diagnostic group alone was not associated with DASH after adjustment ($\beta=22.95$, $p=0.42$). Higher kinesiophobia was the strongest independent determinant of greater disability ($\beta=2.18$ per 1-point increase in Tampa, $p<0.001$), with no significant interaction with the diagnostic group (group $\times$ Tampa $\beta=0.28$, $p=0.73$), indicating a similar effect in nerve and fracture patients. Habitual exercise showed a borderline-significant association:

patients who reported no exercise (code 2) had approximately 11 points higher DASH scores than those who exercised (code 1; $\beta=11.12$, $p=0.0496$), again without a significant group interaction. A significant interaction was observed for depressive symptoms. In the peripheral nerve group, higher HADS-Depression scores tended to be associated with worse disability (main-effect $\beta=1.65$, $p=0.14$), whereas in the fracture group the slope was reversed, yielding a significant group $\times$ HADS-Depression interaction ($\beta=-4.00$, $p=0.041$). Anxiety, activity-related pain, grip and pinch strength, age, sex and education did not show statistically significant independent associations in this full model.

Conclusions: Across peripheral nerve and fracture cohorts, upper-extremity disability was driven more by kinesiophobia and lack of habitual exercise than by the diagnostic group itself. Depressive symptoms appeared to play a larger role in disability after peripheral nerve injuries than after fractures, although this finding requires confirmation in larger samples. These results support routine assessment and treatment of kinesiophobia and, in nerve lesions, depressive symptoms, in addition to impairment-focused rehabilitation in patients with upper-extremity trauma.

A-0646 CORRECTIVE OSTEOTOMY OF THE DISTAL RADIUS WITH CONCOMITANT SHORTENING OSTEOTOMY OF THE DISTAL ULNA AFTER MALUNION OF THE COMPLETE METAPHYSEAL FOREARM FRACTURE IN TEENAGE MALE Petr Macháč¹, András Vizi², Tamás Kassai³

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Background: The forearm fractures make almost 40% of all fractures in childhood, about half of them is localised in the distal part. The self-corrective healing potential in the age under 10 years is enormous, above the age of 12 is this feature noticeably decreased, so that the correct reduction and retention is paramount.

Case report: A 14-year-old boy was referred for hand surgical consult with deviation of his left wrist, painful weightbearing and loss of strength. 1,5 years prior he fell on his left forearm, causing him a complete metaphyseal fracture of his distal forearm. This was treated percutaneously by K wire into the radius for 4 weeks and immobilisation for almost 10 weeks. After this treatment the boy disappeared from check-up and came back more than 1 year later with the above-mentioned problems. On the x-ray healed fractures were seen, but the radius showed about 20° dorsal angulation and 45° radial deviation with arrest of the radial half of the epiphyseal plate of the radius, the ulnar part stayed intact. This deviation did not cause any complaint about range of motion, but did cause painful weightbearing. Corrective osteotomy was indicated. Intraoperatively osseous bar was seen in the radial growth plate, distraction was nearly impossible, therefore a concomitant ulna shortening osteotomy and distal ulnar epiphysiodesis was performed and the bone stock from ulna used to fill the defect in radius after open-wedge osteotomy and distraction. In a 3-months check-up full osseous integration and pain free, almost full range-of-motion was observed.

Conclusion: In forearm fractures, the proper evaluation of the displacement, reduction and retention, as well as the ability of spontaneous correction of angulation according to the age of the patient and state of the epiphyseal growth plate must be thoroughly examined in order to prevent secondary displacement and posttraumatic changes, that may lead to growth arrest and unpleasant deformity with difficulties during weightbearing and motion. Corrective osteotomy improves the osseous congruity but may be very challenging even in the hands of experienced surgeon.

A-0647 TOPOGRAPHIC AND MORPHOMETRIC MAPPING OF MEDIAN AND ULNAR MOTOR BRANCHES FOR HYPERSELECTIVE NEURECTOMY

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Introduction: Hyperselective neurectomy and nerve transfer procedures require precise knowledge of motor branch anatomy. Accurate localization of branch origins relative to fixed bony landmarks supports safe exposure and selective denervation. While positional anatomy is the primary guide, morphometric features such as branch diameter may provide additional context, although their functional relevance remains uncertain. By combining localization and diameter measurements, this study aims to expand the anatomical basis for planning hyperselective neurectomy and reconstructive procedures.

Aim: To define the origin levels, diameters, and proportional forearm localization of median and ulnar motor branches.

Materials & Methods: Thirteen fresh adult upper limbs were dissected through a volar approach. Distances from the medial epicondyle to motor branch origins, branch and trunk diameters, terminal branch entry points, and proportional localization relative to medial epicondyle–pisiform length were recorded. Motor branches of the median nerve (PT, FCR, AIN, FDS, lumbricals) and ulnar nerve (FCU, FDP, deep motor branch) were evaluated.

Results: The medial epicondyle–pisiform length averaged 281.6 ± 24.9 mm. For the median nerve, the pronator teres branch originated 35.3 ± 26.0 mm from the medial epicondyle (12.5%; diameter 3.1 ± 1.5 mm), and the flexor carpi radialis branch at 67.0 ± 17.8 mm (23.8%; diameter 3.8 ± 1.9 mm). The anterior interosseous nerve arose at 86.6 ± 15.3 mm (30.8%). Proximal and distal FDS trunks originated at 29.9% and 53.7% of forearm length, with terminal branch diameters averaging 2.4 ± 1.6 mm. Lumbrical branches entered muscle at 45.9 ± 7.4 mm, and distal branching beyond the wrist crease occurred 38.8 ± 8.0 mm. A Berrettini anastomosis was present in 42% of specimens, while no Riché–Cannieu connections were identified.

For the ulnar nerve, the proximal FCU branch arose 43.9 ± 21.8 mm (15.6%; diameter 1.67 ± 0.87 mm), and the FDP motor branch at 81.8 ± 42.5 mm (29.0%; diameter 2.33 ± 0.87 mm), both within the proximal third. A distal FCU branch originated 94.4 ± 54.2 mm (33.5%). The distal FCU trunk measured 35.7 ± 15.9 mm. The FDP trunk measured 17.6 ± 6.4 mm, with terminal entry 12.6 ± 6.2 mm from its origin. The deep motor branch originated distal to the pisiform (beyond 100% of forearm length), and the adductor pollicis branch was reached after 37.8 ± 9.7 mm; its trunk diameter (3.07 ± 0.73 mm) was the largest among ulnar motor branches.

Conclusion: Motor branch origin levels of the median and ulnar nerves demonstrate consistent proportional relationships to the medial epicondyle and wrist crease, providing reliable landmarks for selective denervation and nerve transfer planning. This study also incorporates detailed diameter measurements which, to the best of our knowledge, have not been specifically reported in prior anatomical work. Although diameter may reflect axonal content, its correlation with selective neural activation or intraoperative excitability is not absolute and cannot be assessed in cadaveric tissue. These morphometric findings may help guide future anatomical, histological, and electrophysiological studies aimed at clarifying the potential role of branch size in hyperselective neurectomy.

A-0648 EFFICACY AND SAFETY OF ANTI-TNF ADALIMUMAB AS AN ADJUNCT TO NEEDLE FASCIOTOMY IN DUPUYTREN CONTRACTURE: A RANDOMIZED CONTROLLED PILOT STUDY

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Introduction: Dupuytren disease (DD) is a fibroproliferative disorder characterized by palmar fascia thickening and progressive digital flexion contractures. Needle fasciotomy offers a minimally invasive treatment option but is limited by incomplete correction and recurrence, especially in patients with high diathesis scores. Tumor necrosis factor (TNF) promotes myofibroblast activity and collagen deposition in DD. Adalimumab, an anti-TNF agent, downregulates myofibroblast phenotype and collagen production, potentially enhancing fasciotomy outcomes. We hypothesize that a single perioperative injection of Adalimumab during needle fasciotomy improves clinical outcomes without increasing adverse effects compared to placebo.

Aim: The aim of this randomized controlled pilot study was to determine whether a single intra-lesional injection of adalimumab administered during needle fasciotomy improves extension range of motion and patient-reported outcomes compared with placebo. Secondary aims were to assess effects on recurrence rate, pain, satisfaction, functional disability score, and safety.

Material and Methods: A prospective, double-blind, randomized placebo-controlled trial was performed at a single academic center. Thirty adults with Dupuytren disease were enrolled between 2023 and 2025. Eligible participants had compound MCP or PIP joint contractures amenable to needle fasciotomy, a diathesis score greater than four, and no previous surgery on the treated finger. Participants were randomized to receive either adalimumab 40 mg in 0.4 ml or placebo, administered intra-lesionally immediately after mechanical release during needle fasciotomy. Blinding was maintained for patients, surgeons, and outcome assessors. Follow-up occurred at ten days, six weeks, three months, and twelve months.

The primary endpoint was improvement in extension of more than ten degrees in any treated joint compared with baseline. Secondary endpoints included change in total passive extension deficit, pain and satisfaction measured on visual analogue scales, QuickDASH score, and recurrence rate. Safety monitoring included adverse event reporting. Statistical analysis was performed using Fisher exact testing for categorical outcomes and Mann Whitney U testing for continuous outcomes.

Results: Twenty-nine patients completed follow-up. Baseline characteristics were similar between groups. At three months and twelve months, the majority of patients in both groups achieved at least ten degrees improvement in extension, with no significant between-group difference. Total passive extension deficit decreased substantially in both groups at three and twelve months, again without significant differences. Pain, satisfaction, and QuickDASH scores improved over time in both groups with no significant advantage for adalimumab. One serious adverse event occurred, unrelated to the investigational product. No safety concerns attributable to adalimumab were identified.

Conclusion: Needle fasciotomy remains an efficient minimally invasive treatment for Dupuytren contracture, providing substantial improvement in extension and functional outcomes. In this randomized controlled pilot study, adding a single intra-lesional injection of adalimumab during fasciotomy was safe but did not yield significant additional benefit over placebo in terms of extension gain, recurrence, or patient-reported outcomes.

A-0649 REVISION SURGERY FOR RECURRENT CUBITAL TUNNEL SYNDROME AFTER SUBCUTANEOUS ANTERIOR TRANSPOSITION: RETROSPECTIVE COMPARISON OF SUBMUSCULAR TRANSPOSITION AND NEUROLYSIS WITH FAT FLAP WRAPPING

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Introduction: Some patients experience recurrent symptoms after subcutaneous anterior transposition for cubital tunnel syndrome. Although recurrence is not very common, recurrent cases are often difficult to treat and reported outcomes of revision surgery remain suboptimal. Perineural scarring around the ulnar nerve is considered a major cause of failure, but few comparative studies have evaluated different revision procedures in this setting.

Aim: To review the outcomes of revision surgery for recurrent cubital tunnel syndrome after subcutaneous anterior transposition and to compare submuscular transposition with external neurolysis combined with nerve wrapping using a local fat flap.

Material & Methods: We retrospectively reviewed 11 patients (13 limbs) who underwent revision surgery for recurrent cubital tunnel syndrome after primary subcutaneous anterior transposition between 2011 and 2024. The mean age at revision was 52 years (range, 16–65 years); there were 6 men and 5 women. The mean interval from primary surgery to revision was 94 months (range, 6–550 months). Revision procedures consisted of submuscular transposition of the ulnar nerve in 8 limbs (transposition group) and external neurolysis with nerve wrapping using a local fat flap in 5 limbs (neurolysis group). Outcome measures at final follow-up were grip strength as a percentage of the contralateral side (excluding bilateral cases), 0–10 pain numeric rating scale (NRS), HAND20 score, and Modified Bishop score.

Results: Mean grip strength at final follow-up was 61% of the contralateral side in the transposition group and 60% in the neurolysis group. Pain NRS changed from 4.8 to 4.6 in the transposition group, showing little improvement, and from 8.0 to 5.0 in the neurolysis group, indicating greater pain reduction in this group. HAND20 improved from 33 to 25 in the transposition group and from 69 to 60 in the neurolysis group, indicating functional gain in both groups. At final follow-up, the Modified Bishop score in the transposition group was Good in 1 limb, Fair in 6, and Poor in 1, whereas in the neurolysis group it was Good in 2 limbs and Fair in 3, with no limbs classified as Poor. Notably, three limbs in the transposition group showed initial improvement followed by recurrent symptoms, likely related to perineural constriction from scar tissue. Formal statistical comparisons were not performed, but the neurolysis group tended to show better pain relief and fewer poor outcomes.

Conclusions: Revision surgery for recurrent cubital tunnel syndrome after subcutaneous anterior transposition provided only limited functional and symptomatic improvement. This study is limited by the small sample size, retrospective design, and potential selection bias. Nevertheless, our findings suggest that nerve wrapping with a local fat flap may help reduce perineural scarring and symptom recurrence compared with submuscular transposition and should be considered as one of the treatment options in revision surgery for recurrent cubital tunnel syndrome. Prospective studies with larger cohorts are needed to establish an optimal revision strategy for this difficult-to-treat condition.

A-0650 OPTIMIZING FINGERTIP RECONSTRUCTION WITH THE FREE PULP FLAP: A RELIABLE SENSATE OPTION

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Introduction: Fingertip defects involving pulp loss present both functional and aesthetic challenges, particularly due to the need for durable soft-tissue coverage with preserved sensibility. The free pulp flap, harvested from the toe or finger

pulp, provides glabrous and sensate tissue that closely replicates the native fingertip, making it a valuable option in distal digital reconstruction.

Aim: To evaluate the indications, surgical technique, and clinical outcomes of free pulp flap transfer in the reconstruction of fingertip defects.

Material & Methods: A retrospective review was performed on patients who underwent free pulp flap reconstruction for fingertip injuries between 2022 and 2025. Demographic data, mechanism of injury, defect characteristics, flap dimensions, donor-site selection, pedicle anatomy, operative details, complications, and need for secondary procedures were recorded. Sensory recovery was assessed using static two-point discrimination, and functional outcomes were evaluated at a minimum of 6-month follow-up.

Results: A total of 11 patients (12 digits) were included. All flaps survived, with partial venous congestion noted in 2 cases and resolved with conservative management. The reconstructed fingertips demonstrated high durability, contour stability, and patient-reported satisfaction. Donor-site morbidity was minimal, with no gait disturbance or long-term sensory complaints in toe donor sites.

Conclusions: The free pulp flap is a reliable and functionally effective method for fingertip reconstruction, offering excellent sensibility, durable coverage, and low donor-site morbidity. It should be considered a primary reconstructive option for complex distal digital defects where tactile function is essential.

A-0651 BIOMECHANICAL ANALYSIS OF MCPJ DIFFERENTIAL ANGLE AND RM ORTHOTIC DESIGN ON IPJ MECHANICS

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Introduction: The Relative Motion (RM) orthosis is a therapeutic device used by hand therapists to improve active interphalangeal joint (IPJ) motion while maintaining functional hand use. It positions the metacarpophalangeal joint (MCPJ) of the affected finger in greater flexion or extension relative to adjacent fingers, enhancing torque transmission to distal joints. However, the optimal MCPJ differential angle and RM orthosis design for efficient IPJ training remain unclear. Clinically, therapists commonly position the affected finger 10-30° more flexed or extended than neighboring digits, typically using a 3- or 4-finger orthosis, but evidence supporting specific configurations is limited.

A preliminary biomechanical study (December 2024) investigated how MCPJ differential angle and RM design affect IPJ motion and tendon force. Seven specimens were used to assess IPJ flexion with RM extension (RME) orthoses and six for IPJ extension with RM flexion (RMF) orthoses.

Preliminary results indicated that the most efficient configuration for IPJ extension- requiring the least extensor digitorum communis (EDC) muscle force - was a 3-finger RMF orthosis with 20° MCPJ angulation for the index and small fingers, and a 4-finger design with 20° for the middle and ring fingers. For IPJ flexion, the most effective RME design was a 3-finger configuration for all digits, with 20° MCPJ angulation optimal for the index and ring fingers and 30° for the middle and small fingers.

To confirm these findings, a follow-up study was conducted in August 2025 using an improved 3D-printed measurement apparatus.

Materials and methods: Seven fresh-frozen cadaver hands were tested. The FDP and EDC tendons were looped proximal to the retinaculum extensorum and retinaculum flexorum, respectively, using 4-0 Prolene wire. For each RM orthosis design, force was applied to the EDC or FDP muscle using a fishing rod swivel, allowing a constant increase in tendon tension until maximum IPJ motion was achieved. A scale was placed between the surgical wire and the swivel to measure

force in grams. The minimal force required to produce maximum IPJ motion was recorded, using the mean of three repetitions per condition for analysis.

Results: The optimal reference angle to the adjacent finger was 20° for all MCPJs. Regarding the orthosis design, the 3-finger RMF design required the least tendon force to achieve optimal IPJ extension in the index and middle fingers, whereas the 4-finger RMF design was most efficient for ring and small finger IPJ extension. For the RME orthosis used to actively train IPJ flexion, the design requiring the least tendon force was a 4-finger orthosis for the index and small fingers, and a 3-finger design for the middle and ring fingers, respectively.

Conclusions: Both studies identified a 20° MCPJ angulation as optimal for minimizing tendon force, indicating a consistent biomechanical advantage. However, differences emerged in optimal orthosis configuration: the preliminary study favored 3-finger RME designs, while the follow-up revealed finger-specific variations. These findings highlight the need for individualized orthosis selection and suggest that RM orthoses should be tailored to finger function and rehabilitation goals to maximize training efficiency.

A-0652 AUDIT OF OPERATION NOTE COMPLIANCE WITH THE RCS GSP MINIMUM DATA SET GUIDELINES FOR HAND TRAUMA PATIENTS AT ST VINCENT'S UNIVERSITY HOSPITAL PLASTIC SURGERY DEPARTMENT: STRIKING A BALANCE IN DOCUMENTATION

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Introduction: Comprehensive and accurate operation notes are vital for continuity of care, multidisciplinary communication, and optimal patient outcomes in hand trauma surgery. The Royal College of Surgeons of England (RCS) Good Surgical Practice (GSP) 2025 guidelines specify an 18-point minimum data set for operative documentation; while the British Society for Surgery of the Hand (BSSH) provides guidance, no minimum data set tailored for hand surgery operation notes exists. Recent literature highlights variability in documentation standards, underscoring the need for consistent practice. Allied health professionals, including physiotherapists and occupational therapists, depend heavily on detailed operation notes to inform rehabilitation strategies, particularly regarding early active mobilisation (EAM), range of movement (ROM) protocols, and splinting requirements. This audit evaluates compliance with RCS GSP Minimum Data Set Guidelines for Hand Trauma Patients, focusing on completeness, clinical utility and opportunities to enhance surgical documentation for effective handover.

Aim: To assess compliance of operation notes for hand trauma cases within the SVUH Plastic Surgery Department with the RCS GSP 2025 minimum data set, identifying documentation deficiencies and improvement opportunities.

Material & Methods: A retrospective audit analysed 50 consecutive hand trauma operation notes from September 2025 against 19 data points (18 RCS GSP + date excluding time). Following review, five hand therapy-specific criteria developed in conjunction with SVUH therapists, were also assessed: Mechanism of injury, Zone of injury (tendon repairs), documented quality of repair, status of pulleys, clear post-operative instructions for functional rehabilitation.

Data were collected using a structured Excel template and analysed descriptively.

Results: Overall RCS GSP compliance was 54.1% (mean 9.9/19 fields; range 6–14). Core identifiers were well documented: surgeon name (100%), signature (100%), operation date (98%). Operative details were poorly recorded: estimated blood loss (20%), time (34%), anaesthetist name (30.4%).

Compliance with hand therapy specific data points was notably lower, with a mean of 1.4 compliant fields per case (range 0–5), reflecting an average compliance rate of 40.4%. Among the five hand therapy criteria assessed, clear post-operative instructions were the most frequently included (70%), whereas mechanism of injury and zone of injury for tendon repairs were documented least consistently, at 20% and 22%, respectively. This highlights a lack of standardisation in the recording of key information necessary for post-operative rehabilitation planning.

Compliance with RCS GSP data points (54.1%) exceeded that for hand therapy specific fields (40.4%), highlighting a limited integration of rehabilitation-relevant details within operative documentation. Collectively, these findings indicate that while the core surgical information is well represented, documentation of critical multidisciplinary communication elements, particularly those guiding hand therapy management, remain inadequate.

Conclusions: This audit identifies significant documentation deficiencies within hand trauma operative notes at SVUH, particularly concerning data required by hand therapy teams. Following an educational intervention on RCS and hand-specific standards, in addition to the integration of a structured note template aligned with RCS GSP and enriched with therapy-specific data fields, improved compliance, communication, and rehabilitation outcomes can be achieved. Crucially, achieving balance by including salient details (hand therapy required) without overloading the operative note with excess information.

A-0654 PARTIAL WRIST DENERVATION FOR WRIST OSTEOARTHRITIS: A FIVE-YEAR FOLLOW-UP

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Introduction: Partial wrist denervation is a surgical procedure that involves transecting the anterior (AIN) and/or posterior (PIN) interosseous sensory nerves supplying the articular capsule to relieve wrist pain. This technique offers a less invasive, motion-preserving alternative to arthrodesis, arthroplasty, or proximal row carpectomy. However, evidence on long-term outcomes remains limited.

Aim: The aim of this study was to evaluate five-year outcomes of partial wrist denervation in patients with painful wrist osteoarthritis. Outcomes included patient-reported measures (DASH, PRWE, EQ-5D-3L, and pain), objective functional assessments, radiographic progression, and treatment failure, defined as the need for additional surgery.

Material & Methods: In this prospective single-group interventional study, conducted between 2018 and 2020, 60 consecutive patients with wrist osteoarthritis due to scapholunate advanced collapse (SLAC), scaphoid non-union advanced collapse (SNAC), distal radius fracture, or Kienböck's disease underwent partial wrist denervation via a dorsal incision under local anaesthesia. Outcomes were assessed at baseline, one year, and five years and analysed using generalized estimating equations. Radiographs were reviewed at baseline and five years. Treatment failure was analysed using Kaplan–Meier survival analysis and Cox regression.

Results: After five years, patients without additional surgery showed significant improvements in DASH, PRWE, and pain scores, all exceeding the minimal clinically important difference. No significant changes were observed in EQ-5D-3L, grip strength or range of motion. Radiographic progression occurred in approximately 20% of patients. Fewer than half of the patients required additional surgery.

Conclusions: Patients who did not require further procedures showed significant improvements in patient-reported outcomes after five years. Further studies should confirm these findings and determine which patients are most likely to benefit from partial wrist denervation.

A-0655 OCCUPATIONAL PERFORMANCE IN DIGITAL VERSUS PAPER-BASED EXERCISES AFTER SURGERY FOR DISTAL RADIUS FRACTURES IN SWITZERLAND: FEASIBILITY AND PRELIMINARY RESULTS OF AN ONGOING RANDOMIZED CONTROLLED TRIAL

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Purpose: Healthcare systems worldwide are increasingly focused on telehealth development, including smartphone applications. This approach could greatly influence rehabilitation outcomes after wrist fracture surgery. An ongoing randomized controlled trial is investigating this topic, and our study aims to explore its preliminary results to enhance scientific rigor and reliability.

Method: This multiple case study included participants (N=10) aged 18-65 post-distal radius fracture surgery at a single centre in Switzerland. A home exercise program was provided either (1) by a smartphone application, featuring videos, oral, and written instructions (intervention group), or (2) on paper with pictures and brief written explanations (control group). Feasibility and outcome measures were assessed under the scope of occupational performance at baseline, weeks 6 and 12. Data were stored on REDCap and analysed with SPSS 29.

Results: Although the preliminary analysis suggested that the study procedures appeared feasible and effective, additional measures might be required to meet the recruitment target on time. Similar outcomes among participants in terms of occupational performance, including return to work, performance skills and client factors were observed. However, participants showed more regularity in treatment adherence and greater satisfaction with treatment modality in the intervention group.

Conclusion: Data collection for the ongoing RCT must be completed to obtain significant and generalizable results. Smartphone applications, part of the ongoing global expansion of telehealth, might be considered as a useful, modern and alternative tool for future patient care and occupational therapy.

A-0656 RISK FACTORS FOR NAIL DYSTROPHY FOLLOWING DISTAL PHALANGEAL FRACTURES OF THE HAND

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Introduction: Distal phalangeal fractures are commonly associated with nail unit injuries and may cause long-term nail dystrophy. However, the risk factors associated with such deformities are poorly understood.

Aim: In this study, we aimed to assess the potential risk factors associated with nail dystrophy following distal phalangeal fractures.

Material & Methods: We conducted a retrospective review of adult patients with distal phalanx fractures treated at a single hand surgery centre between January 2015 and December 2019. The patients were followed up clinically and radiographically for at least one year post-injury.

Results: We included 112 patients with 128 distal phalangeal fractures and nail dystrophy developed in 50 patients. The significant independent predictors of nail dystrophy included nail bed injury and nonunion. Nail bed suturing, fracture location, trauma type, and dorsal rim incongruence were not independently associated with outcomes using multivariate analysis.

Conclusions: The risk of post-traumatic nail dystrophy was significantly increased by nail bed injury and phalangeal nonunion.

A-0657 COMPARISON OF WIDE- AWAKE LOCAL ANESTHESIA NO TOURNIQUET VERSUS BIER'S BLOCK ANESTHESIA IN SURGICAL FIXATION OF UNSTABLE DISTAL RADIUS FRACTURES WITH VOLAR PLATING

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Introduction: Distal radius fractures are a common injury seen in the emergency department, affecting patients of all ages and genders. These fractures are often unstable and require surgical intervention, typically via open reduction and internal fixation (ORIF). Traditionally, these procedures are performed under regional or general anesthesia to manage pain and achieve a bloodless surgical field using a tourniquet. However, recent advancements have introduced Wide-Awake Local Anesthesia No Tourniquet (WALANT) technique for minor hand and wrist surgical procedures. This method, which involves a local anesthetic injection combined with epinephrine, provides pain relief and hemostasis without the need for sedation or tourniquet application.

Aim: This study aims to compare the efficacy of the WALANT versus Bier's Block for unstable distal radius fracture fixation, specifically in terms of pain management, postoperative outcomes and surgical parameters

Material & Methods: This study included 51 patients with unstable distal radius fractures, aged 41 to 73 years (mean age 57.9 years). Demographic data, fracture type, mechanism of injury and anesthesia method (Bier's block or WALANT) were recorded. All fractures were treated using the extension carpi radialis approach and palmar locking plate fixation. The procedures were performed within 10 days (range 1–15 days) of injury. Pain levels intraoperatively and postoperatively were measured using the Visual Analog Scale (VAS). Additional data collected included the duration of surgery, duration of postoperative analgesic use, preoperative anxiety (using the Amsterdam Preoperative Anxiety and Information Scale [APAIS]) and functional outcomes and range of motion at six months postoperatively (Quick DASH score).

Results: Of the 51 patients, 26 underwent surgery with Bier's block anesthesia and the remaining patients were treated with WALANT. The mean intraoperative pain score was 2/10 in the WALANT group and 3/10 in the BB group, while the immediate postoperative mean VAS score was 1/10 and 6/10 respectively. There were no significant differences in APAIS scores between the two groups (WALANT: 4.45, Bier's block: 4.58). Patients in the WALANT group were discharged on the same day as surgery, while those in the Bier's block group were discharged the following day. The mean duration of postoperative analgesic use was significantly shorter in the WALANT group (2.4 days) compared to the Bier's block group (5.7 days). The average surgical time was longer in the WALANT group (60.12 minutes) compared to the Bier's block group (54.23 minutes). At six months postoperatively, both groups showed similar functional outcomes and range of motion, with no statistically significant differences.

Conclusions: WALANT technique offered advantages such as lower postoperative pain scores, reduced analgesic use, intraoperative patient collaboration with active range of motion and the ability to discharge patients on the same day. These findings suggest that WALANT may be the preferred anesthesia technique for this procedure.

A-0659 PERITRAPEZOIDAL FRACTURE DISLOCATION: A CASE REPORT AND REVIEW OF LITERATURE

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Introduction: Peritrapezoidal fracture dislocations are rare but severe injuries following high-energy traumas and axial loading mechanism. We present a case of a peritrapezoidal fracture dislocation treated at our institution and followed-up for one year and discuss available literature about these injuries.

Aim: The aim was to perform a review of the literature about peritrapezoidal fracture dislocations and discuss the available evidence on management of these injuries.

Materials and Methods: We searched for relevant publications on PubMed using appropriate key-words. Retrieved publications were reviewed and selected. Finally, selected publications were analyzed in detail.

Discussion: At our institution a 37-year-old man sustaining a high-speed motorcycle crush injury presentend with a visible deformity of the 2nd ray of the left adominant hand. X-Rays and CT-scan showed a dorsal luxation of the trapezoid and the CMC-3-joint with additional shaft fractures of the proximal phalanges of the index and middle finger. Open reduction of the trapezoid and temporary K-Wire transfixation of the CMC-3-, trapeziotrapezoidal- and capitotrapezoidal-joint as well as CRIF of the proximal phalanx fractures were performed in an emergency setting. Carpal tunnel decompression needed to be performed shortly after because of new evolving paresthesias in the median nerve distribution. The wrist was immobilized in a splint for 6 weeks with active load-free motion being started right after. K-wires were removed after 8 weeks. Load bearing was started after 12 weeks. The patient returned to work full-time as a mechanical technician after 16 weeks. Clinical and radiographic follow-up is available up to 1 year postoperatively.

In our review of the literature, 22 relevant publications on peritrapezoidal fracture dislocation were found, 12 of them describing a similar pattern of injury to our case. According to the available literature, isolated luxation of the trapezoid is a rare injury, with dislocation occurring more frequently dorsally rather than palmarly due to high-energy traumas and axial loading mechanism. Luxation of the trapezoid is frequently associated with concomitant dislocation of carpometacarpal-joints. Literature suggests low threshold for further imaging in suspicious cases to avoid delayed or missed diagnosis. Closed reduction is rarely successful, most commonly open reduction and pinning is required. The injury is comparable with a perilunate fracture dislocation, both result from a high energy trauma. Therefore, a low threshold to decompress the median nerve in the primary surgery is advisable. Long-term results with follow-up over two years are missing. In conclusion, though rare, peritrapezoidal fracture dislocations are severe injuries caused by high-energy traumas. Prompt recognition and treatment are essential to restore balance of the carpus.

A-0660 INVESTIGATION OF THE EFFECTS OF MOTOR CONTROL EXERCISES DELIVERED VIA TELEREHABILITATION ON SHOULDER FUNCTION AND QUALITY OF LIFE IN PATIENTS UNDERGOING ROTATOR CUFF REPAIR

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Introduction: Motor control exercises are crucial for maintaining the correct position of the scapula in shoulder pathologies. But no studies have been found in the literature on the remote delivery of motor control exercises via telerehabilitation.

Aim: The aim of this study was to investigate the effects of motor control (MC) exercises delivered via telerehabilitation

on shoulder function and quality of life in patients who underwent rotator cuff (RC) repair.

Material & Methods: Pain (VAS), range of motion (ROM), lateral scapular slide test (LSST), function (American Shoulder and Elbow Surgeons Shoulder Score—ASES), and quality of life (Western Ontario Rotator Cuff Index—WORC) were assessed preoperatively and at 6 and 12 weeks postoperatively. Muscle strength (hand dynamometer) was evaluated preoperatively and at postoperative week 12. Participants were allocated into two groups: Standard Rehabilitation Group (STD) and Motor Control Group (MC). The rehabilitation program was delivered via video calls twice weekly for 12 weeks. Between-group comparisons were analyzed using independent samples t-test and Mann–Whitney U test. Pre–post intervention comparisons were analyzed using repeated measures ANOVA and Friedman test.

Results: A total of 34 participants (29 women, 5 men) were included (STD=17, MC=17). Pain levels decreased in both groups ($p<0.05$). At postoperative week 6, night pain levels were significantly lower in the MC group compared with the STD group ($p=0.011$). However, there is no difference between the groups in pain change ($p>0.05$). All ROM values improved in both groups at postoperative 12 week ($p<0.05$). Although shoulder external rotation (ER) ROM at postoperative week 12 was significantly higher in the MC group ($p=0.039$), there is no difference between the groups in ROM change ($p>0.05$). Differences in LSST values between the two scapulae across all three positions (0° , 45° , and 90° abduction) decreased significantly more in the MC group at week 12 ($p<0.001$). Muscle strength increased in both groups compared to preoperative levels ($p<0.05$). The MC group had greater increases in flexion, abduction, and scapular elevation strength ($p=0.034$, $p=0.038$ and $p=0.045$, respectively). ASES and WORC function results improved in both groups at week 12 ($p<0.05$). But, no significant differences were found between groups in ASES scores and changes at any time point ($p>0.05$). In contrast, WORC scores demonstrated significant improvement in the MC group at week 12 ($p<0.05$). However there is no difference between the groups in WORC scores changes ($p>0.05$).

Conclusions: According to our findings, both exercise protocols provided via telerehabilitation were found to be effective in reducing pain, improving ROM, shoulder girdle muscle strength, function, and quality of life. However, MC exercises added to STD rehabilitation and delivered via telerehabilitation are more effective than STD rehabilitation alone in improving scapular mobility, increasing shoulder muscle strength.

A-0661 OPEN FASCIETOMY FOR DUPUYTREN CONTRACTURES OF THE HAND DIGITS UNDER BIER'S BLOCK ANESTHESIA VERSUS WALANT TECHNIQUE. A SINGLE CENTER EXPERIENCE

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Introduction: Dupuytren disease is a benign, chronic fibroproliferative disorder of the palmar and digital fascia and adjacent soft tissue, which leads to progressive contracture and impaired digit extension. Surgical treatments, such as open fasciotomy or fasciectomy, are commonly used to manage symptomatic Dupuytren's contractures. Traditionally, these procedures require regional or general anesthesia with a tourniquet. The WALANT (Wide-Awake Local Anesthesia No Tourniquet) technique, which involves local injection of anesthetic and epinephrine, allows for effective local anesthesia and a bloodless surgical field without the need for sedation or a tourniquet

Aim: The purpose of this study is to compare the efficacy of the WALANT anesthetic procedure versus Beer's block (BB) for open fasciectomy in patients Dupuytren contracture.

Material & Methods: This retrospective study analyzed patients who underwent open fasciectomy for Dupuytren's

contracture at a single institution. Demographic data, Tubiana staging of Dupuytren's contracture and anesthesia type (Bier's block or WALANT) were recorded. Pain levels were assessed using the Visual Analog Scale (VAS) intraoperatively and postoperatively. Duration of surgery, analgesic use, preoperative anxiety (measured with the Amsterdam Preoperative Anxiety and Information Scale, APAIS) and functional outcomes (assessed Quick DASH score) at 6 months were also collected. Results: A total of 43 patients (34 males, 9 females) with a mean age of 49 years (range 32-68) who required treatment for symptomatic contractures of digits of the hand were included in the study. According to Tubiana staging, 5 patients had stage II, 31 had stage III and 7 had stage IV Dupuytren's contracture. Twenty-three patients received WALANT as the anesthesia technique, while the remaining patients received Bier's block anesthesia. Mean intraoperative pain was lower in the WALANT group (1,6/10 on the VAS) compared to the BB group (2,9/10). Postoperatively, the median VAS score in the WALANT group was 2/10, while the BB group had a higher VAS score (5,8/10). Two patients of the BB group required conversion to general anesthesia. The APAIS scores did not show significant differences between the two groups (WALANT: 4.65, BB: 4.85). The mean duration of analgesic use was shorter in the WALANT group (1,9 days) compared to the BB group (4.6 days). The average surgical time was longer in the WALANT group (63.25 minutes) than in the BB group (55.45 minutes), though this difference was statistically significant. Patients in the WALANT group were discharged on the same day as surgery, while those in the Bier's block group were discharged the following day. At the final follow-up both groups showed similar functional outcomes and range of motion, with no statistically significant differences. Conclusions: The WALANT technique provided safe and reliable alternative method of anesthesia for open fasciotomy in the management of Dupuytren's Contracture. It offers several advantages, including lower cost, absence of tourniquet-related complications, reduced intraoperative and postoperative pain and the ability for patients to participate during surgery with active finger range of motion. Given these benefits, WALANT should be considered a preferred anesthetic approach for this procedure.

A-0662 WINTA: AN INNOVATIVE ALGORITHM FOR CONSERVATIVE MANAGEMENT OF TFCC INJURIES

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Introduction: The triangular fibrocartilage complex (TFCC) is a critical structure in the wrist that provides stability and wrist proprioception. Injuries to the TFCC can result from trauma or degenerative changes and are a common cause of ulnar-sided wrist pain. Conservative treatment is often the first line of management for TFCC injuries (Lerma et al, 2022). However, existing conservative protocols are typically generalized and insufficiently focussed to patient-specific presentations (Tse, Chau & Wong, 2023; Lerma et al., 2022; Chen, 2021). We identified the need for a more tailored program. **Aim:** To present the Winterthurer TFCC Algorithm (WINTa), an evidence-informed framework designed to guide individualized assessment and exercise progression in the conservative management of TFCC injuries.

Material & Methods: Evidence-Based Framework Development

The structure and content of the algorithm (WINTa) and exercise program is substantiated by recent scientific literature and clinical practise. Core domains were identified—pain, stability and proprioception, mobility, and strength—and linked to decision pathways for structured progression.

Results: WINTa links biomechanical principles with individualized assessment to guide conservative treatment of TFCC injuries. WINTa was developed to aid decision-making in daily hand therapy practice. The algorithm encompasses four thematic areas, enabling therapists to implement tailored strategies based on patient's unique challenges and treatment stages.

Conclusions: Through clinical reasoning, biomechanical principles, and a literature review, we developed an in-depth understanding of individualized exercises tailored to the specific complaints of patients with TFCC injuries. While initial implementation suggests potential benefits in patient-specific outcomes and treatment efficiency, validation through controlled clinical studies is required.

A-0663 VOLAR LOCKING PLATE FOR TRAUMATIC INJURIES OF THE SCAPHOID BONE IN THE WRIST. ANALYSIS OF CASES WITH A FOLLOW-UP PERIOD OF AT LEAST 1 YEAR

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Introduction: Traditionally, the surgical treatment of scaphoid fractures, especially comminuted fractures and non-unions, has relied on the use of cannulated screws. However, recent advances in surgical techniques have led to the increasing use of scaphoid volar locking plates (SVLP). This method offers advantages such as stable and rigid osteosynthesis, as well as the preservation of the anatomical length and axis of the scaphoid. These benefits have made SVLP an appealing alternative among hand surgeons.

Aim: The aim of this study is to evaluate the outcomes of patients with acute comminuted scaphoid fractures and non-unions who were treated with the anatomical low profile palmar plate. Specifically, we sought to assess pain, range of motion, functional outcomes and complications in these patients, with a follow-up period of at least one year.

Material & Methods: Seventeen male patients with an average age of 32.3 years participated in the study. The minimum follow-up period was two years. Twelve patients had dominant hand injuries. Thirteen patients had acute or comminuted fractures classified as Herbert type B. Four patients had non-unions (Herbert type D2), with an average duration of 9.6 months before surgical intervention. We assessed pain (using the Visual Analog Scale), range of motion, functional outcomes (using the Quick Dash and Mayo Wrist Scores) and any postoperative complications. Postoperatively, a palmar splint (wrist-thumb) was applied for three weeks, followed by a functional splint to encourage early protected active mobilization.

Results: The average time for healing was 4.25 months. Six patients required plate removal due to impingement on the palmar edge of the radius. The average Visual Analog Scale (VAS) score for pain was 1.5, indicating minimal pain. The average Quick Dash score was 3.4, suggesting minimal functional impairment. The average Mayo Wrist Score was 88.1, indicating good to excellent functional outcomes. The range of motion results were as follows: palmar flexion 62° ($\pm 4.5^\circ$), extension 55° ($\pm 10.2^\circ$), ulnar deviation 31° ($\pm 4.5^\circ$) and radial deviation 17° ($\pm 2.9^\circ$). These results indicate that the majority of patients experienced functional recovery and satisfactory bony union.

Conclusions: In conclusion, the application of the scaphoid volar locking plates could be an alternative technique for both acute fractures with significant comminution and for nonunions of the scaphoid. Respective method provide reliable union rates and good patient outcomes

A-0665 DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF TRIGGER FINGER: A RETROSPECTIVE STUDY FROM TRZEBNICA, POLAND

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Introduction: Trigger finger is one of the most common hand conditions characterized by impaired tendon gliding and finger locking, causing pain and disability.

Aim: This study aims to analyze the demographics, epidemiology, and clinical presentation of trigger finger cases treated at our specialist hand surgery unit in św. Jadwiga Śląska Hospital in Trzebnica, Poland.

Material & Methods: This retrospective study includes patients who underwent surgical treatment for trigger finger at our institution between 2021 and 2025. A total of 498 patients were operated on during this period, comprising 318 females and 180 males, with a median age of 61 years. Additionally, a structured questionnaire was administered to a randomized subset of 50 patients to assess clinical presentation, symptom duration, functional impairment, and prior treatment history.

Results: Trigger finger surgery was more prevalent in women, constituting 63,9% of cases. In the surveyed group, 56% of symptoms involved the dominant hand, 36% the non-dominant, and 16% both. The median symptom duration before surgery was 6 months, ranging from 1 to 36 months. In women, the thumb (43%) and fourth digit (33%) were most commonly affected, while in men, the fourth (50%) and third digits (35%) predominated. Among respondents, 63% were engaged in physical labor. The main symptoms were pain at the thumb base (90%) and finger locking (88%), with 72% requiring the opposite hand to unlock the finger. Postoperative outcomes showed 84% of surgically treated patients reported complete or near-complete symptom resolution, whereas none of the steroid-injection-treated patients reported significant improvement, indicating superior efficacy of surgical intervention over steroid injection.

A-0666 ANTERIOR BRANCH OF OBTURATOR NERVE TRANSFER FOR FEMORAL NERVE INJURY CAUSED BY PELVIC FRACTURE AND HIP ARTHROPLASTY

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Introduction: Femoral nerve injury results in loss of quadriceps function and difficulty with knee extension, which can impair ambulation

Aim: The aim of this study was to describe successful reconstruction using the anterior branch of the obturator nerve transferred to the motor branches of femoral nerve at the thigh level, and to report the clinical outcomes.

Material & Methods: Four patients with complete femoral nerve injury without spontaneous recovery were enrolled, with injury intervals ranging from 6 to 12 months. All patients were followed for at least 2 years after surgical reconstruction. The primary outcome measures included active knee extension graded by the Medical Research Council (MRC) scale, visual analog scale (VAS) pain scores, Functional Ambulation Category (FAC) levels, and motor unit action potentials (MUAPs) assessed by electrodiagnostic studies.

Results: Two patient sustained a femoral nerve injury due to a pelvic fracture, and the other two due to iatrogenic injury during hip arthroplasty. All patients regained quadriceps strength graded as $\geq$ M4 and achieved a Functional Ambulation Category (FAC) grade of 4 (independent ambulation on level surfaces, but requiring handrails when climbing stairs) after 2

years of follow-up. Noticeable muscle contraction was observed between at 6 to 11 months, and M3 strength was regained between 11 to 15 months, respectively. Motor unit action potentials (MUAPs) were also detected in the reinnervated muscles. The visual analog scale (VAS) pain scores and paresthesia over the medial thigh showed slight improvement in the patient with iatrogenic hip arthroplasty. There was no symptomatic donor-side morbidity, although one patient developed a seroma with cellulitis, which was successfully treated with oral antibiotics without surgical intervention. Conclusions: Transfer of the anterior branch of the obturator nerve appears to be a safe and reliable method for reconstructing femoral nerve function.

A-0667 POSTTRAUMATIC AMPUTATION OF THE THUMB - WHAT TO DO? AN ALGORITHM

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Introduction: The thumb plays a crucial role in hand function. Traumatic amputation of the thumb results in significant disability and necessitates a structured approach to management.

Aim: The aim of this study is to propose a structured treatment algorithm to facilitate personalized care and improve functional outcomes in patients with traumatic thumb amputations.

Material & Methods: This framework is based on clinical experience accumulated from treating 144 patients with thumb amputations between 2004 and 2025 at a specialist hand surgery unit. Over this 21-year period, a structured treatment algorithm was developed and refined to guide decision-making according to amputation level, injury mechanism, and patient-specific factors.

Results: Among the 144 cases, 118 patients underwent replantation with a success rate of 82%. Other reconstructive procedures included flap coverage (six cases), toe-to-thumb transfers (eight cases), index finger pollicisation (six cases), and fourth finger pollicisation (five cases). Functional outcomes were favorable, with 90% returning to work, 83% regaining temperature and touch sensation, and 94% able to lift a 0.5-litre bottle.

A-0668 SURGICAL TREATMENT OF PEDIATRIC HAND BURNS - TERTIARY CENTRE EXPERIENCE IN COHORT OF 122 CHILDREN

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Introduction: Hand burns are common in children. Appropriate surgical treatment has high priority to prevent functional imbalance and to achieve a good aesthetic appearance.

Aim: Assessment of the etiology, surgical approach and outcome of acute hand burns in our cohort during the last ten years.

Material & Methods: The retrospective study included children with acute hand burns who were admitted to the hospital and treated with various therapeutic methods under analgesia or general anesthesia. Depending on the clinical findings, non-operative methods, surgery and combined non-operative and operative treatment were applied. Children were reviewed for age, sex, etiology of injury, affected hand, total body surface area (TBSA) of burn, degree of burn, type of therapeutic procedure and length of hospitalization.

Results: The study included 122 children (80 boys, 42 girls), treated in the tertiary pediatric centre between 2013 - 2023.

The mean age was 5,66 years (range 1 month - 18 years). Most of them were injured by hot liquids (38.52%), followed by electrical injuries (27.86%), contact burns (21,31%), flame burns (11.47%). One boy had an explosive hand burn injury. The right hand was affected in 66 patients, the left one in 25 cases, while 31 children had burns of both hands. Half of the patients had an isolated hand burn injury, and the other half had associated burns on other parts of the body. The TBSA of burn was less of the 10% in most of the patients (87,70%). Children had superficial or deep dermal burns in 34,42%, deep dermal and full thickness burns in 45,90% and isolated full thickness burn injuries in 19.67% of cases. Non-operative procedures were applied in 72.13% of patients. Silver wound dressings were used in 23 and hydrocolloid dressings in 65 children. Operative treatment was performed in 17.21% of cases. Necrectomy with skin grafting was applied in 17 children, finger amputation was performed in two patients, amputation of both arms and forearm with necrectomy and skin grafting was done in one case and fasciotomy followed by necrectomy and skin grafting was performed in one child. A combined non-operative and operative approach was applied in 10,67% of cases. The average time of hospitalization was 11.68 days. Complications occurred in 9 patients. Three patients had keloid scars, three patients had severe joint contractures, and three patients developed permanent disability and impaired hand function.

Conclusions: Treatment of pediatric hand burns implies different operative and non-operative procedures. The therapeutic approach will depend on the extent and severity of the burn injury including wound dressing lining in the superficial or deep dermal burns and surgery in the full thickness burns.

A-0669 SENSORY–AFFECTIVE DISSOCIATION OF PAIN IN RHEUMATOID ARTHRITIS: RELATIONSHIP WITH DAS28 Gamze Ozan¹, Çiğdem Ayhan Kuru¹, Büşra Durak¹, Hanife Avcı², Mustafa Ekici³

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Introduction: Pain in rheumatoid arthritis (RA) is a multidimensional experience integrating sensory-discriminative and affective-motivational components. Upper extremity joints are frequently and often early involved, and pain critically limits function. While composite indices such as the DAS28 are standard for monitoring inflammatory burden, their relationship to distinct pain dimensions is complex and incompletely understood.

Aim: This study aimed to characterize the relative magnitude of sensory and affective pain dimensions in RA and to examine their association with global pain intensity and DAS28-defined disease activity.

Material & Methods: In this cross-sectional study, 105 adults with RA underwent a multidimensional pain assessment. Sensory and affective pain scores were derived from a validated McGill-based instrument. Global pain intensity was rated on a 0–10 visual analogue scale (VAS) and dichotomized as none/mild versus moderate/severe. Disease activity was graded by DAS28 (remission, low, moderate, high); for inferential analyses, remission was contrasted with moderate–high activity. The primary outcome was the within-subject difference between sensory and affective pain scores. Secondary analyses examined (i) whether this difference varied across VAS strata and (ii) whether affective pain differed between DAS28 remission and moderate–high activity, before and after adjustment for VAS and age. Paired t-tests and Wilcoxon signed-rank tests were used for within-subject comparisons, Welch t-tests for between-group contrasts, and multiple linear regression for modelling affective pain with DAS28 category, VAS and age as predictors.

Results: The distribution of the sensory–affective difference deviated from normality (Shapiro–Wilk $W=0.94$, $p=0.0002$). Nevertheless, both parametric and non-parametric tests consistently showed higher sensory than affective pain. The mean within-subject difference was 6.68 points (paired t-test, $t(104)=13.27$, $p<2.2\times 10^{-16}$), and the Wilcoxon test corroborated

this direction ($V=5227$, $p<2.2\times10^{-16}$). In the moderate–severe VAS subgroup ($n=40$), sensory pain remained significantly higher than affective pain (mean difference 7.83; $t(39)=8.76$, $p=9.36\times10^{-11}$). When the sensory–affective difference was compared between none/mild and moderate–severe VAS strata, the difference tended to be larger in the moderate–severe group (7.83 vs 5.97), but this did not reach conventional statistical significance (Welch t-test, $t=1.74$, $p=0.087$; 95% CI -0.27 to 3.99). Affective pain scores were higher in patients with moderate–high DAS28 activity than in remission (5.47 vs 3.43; Welch t-test, $t=2.83$, $p=0.0059$; 95% CI 0.60 – 3.48). However, in the multiple regression model, DAS28 category was no longer a significant predictor of affective pain ($\beta=-0.47$, $p=0.476$), whereas VAS remained strongly associated ($\beta=0.73$, $p=5.68\times10^{-8}$); age was not significant ($\beta=0.007$, $p=0.741$). The model explained 37.8% of the variance in affective pain (adjusted $R^2=0.35$).

Conclusions: In this RA cohort, sensory pain exceeded affective pain even in patients with moderate–severe global pain. The apparent increase in affective pain in those with moderate–high DAS28 activity disappeared after adjustment for global pain, suggesting no independent effect of DAS28. These findings indicate a partial dissociation between inflammatory activity and the affective pain dimension and underline the need for multidimensional pain assessment and for treatment strategies targeting not only inflammation but also affective and cognitive aspects of pain in RA.

A-0670 IMPACT OF THUMB CMC STRATEGY AND REHABILITATION DURATION ON STRENGTH AND COPM OUTCOMES IN TETRAPLEGIA HAND SURGERY

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Introduction: Hand reconstruction in tetraplegia is crucial for restoring independence and improving quality of life. Despite established surgical strategies, high-quality prospective data regarding functional outcomes and the relevance of thumb carpometacarpal (CMC) joint management remain limited.

Aim: This study aims to present over twenty years of experience in upper extremity reconstruction in tetraplegia, focusing on strength outcomes, patient-reported performance and satisfaction, and the impact of CMC arthrodesis compared with motion-preserving techniques.

Material & Methods: From 2003 to 2024, a total of 75 hands in 67 tetraplegic patients, predominantly with sub-C5 or sub-C6 lesions, underwent reconstructive procedures. Prospective assessment has been performed using key-pinch dynamometry and the Canadian Occupational Performance Measure (COPM). Patients with complete pre- and postoperative COPM data were included. Additional analyses evaluated the influence of inpatient rehabilitation duration (<17 vs ≥ 17 days) and compared outcomes between CMC arthrodesis and motion-preserving reconstruction.

Results: Median postoperative key-pinch strength was 1.2 kg in patients with surgical latency under 60 months and 0.9 kg in those with longer latency. COPM performance improved by a median of 2.45 points, and satisfaction increased by 6.2 points, with significantly superior gains in patients receiving at least 17 days of structured inpatient rehabilitation. Comparison of thumb CMC strategies revealed a functional advantage for motion preservation: patients without arthrodesis demonstrated a median strength of 1.3 kg versus 0.85 kg with arthrodesis, alongside more favorable ICSHT ratings.

Conclusions: Tetraplegia hand reconstruction leads to substantial improvements in both subjective and objective function. Extended inpatient rehabilitation is a major determinant of successful outcomes. Motion-preserving management of the thumb CMC joint provides superior strength and functional utility compared with arthrodesis, supporting its role as a preferred technique in modern tetraplegia hand surgery.

A-0671 PREDICTORS OF SPIRAL NERVE FORMATION IN DUPUYTREN'S CONTRACTURE SURGERY

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Introduction: Neurovascular displacement in Dupuytren's contracture represents a major challenge for the operating surgeon, given the potential for iatrogenic nerve damage during fasciectomy. As the disease progresses, the normal anatomic relationship between the digital neurovascular bundle and the peritendinous cords becomes distorted. Both the presence of spiral cords and degree of flexion contracture have been associated with ectopic nerve position, representing valuable targets for predicting risk of inadvertent injury. The Short and Watson sign (SWS) is clinically evident as a mobile tissue mass at the base of the finger and is reported to be indicative of the presence of a spiral nerve.

Aim: The objective of this study is to determine the merit of using degree of flexion contracture and the SWS as indicators of the presence of a spiral nerve.

Material & Methods: This prospective observational study, with ethical approval, examined all patients prior to selective fasciectomy or dermofasciectomy. Pre-operative assessment documented the status of redundant pulpy tissue at the palmar digital crease and the severity of flexion contracture at metacarpophalangeal and interphalangeal joints. The intra-operative existence of a spiral nerve served as the definitive outcome measure.

Results: To date 56 digits in 39 patients have been included in the study. The sensitivity of a soft tissue mass alone as a predictor of a spiral nerve was 53% and the specificity 89%. The presence of a flexion contracture at the PIP joint had a sensitivity of 80% and a specificity of 38.8% for the presence of a spiral nerve. The combination of a soft tissue mass and a PIP joint contracture was a very specific (84%) but not a particularly sensitive (77%) indicator for spiral nerve formation.

Conclusions: From a surgical perspective, these results emphasize the importance of careful dissection under magnification and stepwise excision of cords. Despite the small sample size, this study demonstrates a clear correlation of both the SWS and PIP joint contracture with the presence of a spiral nerve. The findings have clinical implications with respect to patient counselling, pre-operative planning and selecting cases suitable for autonomous trainee operating.

A-0672 INVESTIGATION OF UPPER EXTREMITY KINEMATICS DURING RUNNING IN CHILDREN WITH OBSTETRIC BRACHIAL PLEXUS INJURY

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Introduction: Obstetric Brachial Plexus Injury (OBPI) is a clinical condition arising from damage to the roots or nerves forming the brachial plexus due to various risk factors during birth. This affects children's functional abilities and participation in daily activities. Running is an important childhood activity that requires coordinated, symmetrical movements of the upper and lower extremities as the feet leave the ground and the body moves forward. Arm swing during running helps limit the torso's angular motion and, as a result, reduces metabolic energy expenditure.

Aim: The aim of this study was to examine upper-limb kinematics in children with OBPI during running performance and to compare affected and unaffected limbs with those of typically developing children.

Material & Methods: Eleven children with OBPI (Age: 11.72 ± 3.0 years; BMI: 18.92 ± 3.8 kg/m²) and eleven typically

developing children (TDC) (Age: 10.81 ± 2.22 years; BMI: 18.47 ± 4.26 kg/m²) were included. The OBPI group consisted of children classified as Type I–II according to the Narakas system (Type I: 4; Type II: 7). Their functional status was evaluated using the Modified Mallet Classification (score: 20 ± 1.61). For three-dimensional running analysis, markers were placed on anatomical landmarks following the VICON Plug-in Gait Full Body protocol. Participants ran on an 8-meter runway at a self-selected speed while wearing standard shoes. Three trials were collected for each participant to assess upper-limb kinematics during running, and mean range of motion (ROM) values were analyzed using paired t-tests ($p < 0.05$). Results: In the OBPI group, shoulder flexion–extension ($p < 0.001$), internal–external rotation ($p = 0.01$), and elbow flexion–extension movement ranges ($p < 0.001$) were significantly greater in the unaffected limb compared with the affected limb. Shoulder flexion–extension ($p = 0.0001$) and internal–external rotation ranges ($p = 0.03$) were significantly greater in the affected limb of the OBPI group compared with the non-dominant limb of the TDC group, whereas supination–pronation ROM was significantly greater in the TDC group’s non-dominant limb ($p = 0.05$). Additionally, shoulder flexion–extension ($p = 0.004$) and internal–external rotation ranges ($p = 0.01$) were significantly greater in the unaffected limb of the OBPI group compared with the dominant limb of the TDC group.

Conclusions: The findings indicate that running exposes clear compensatory patterns in children with OBPI. The unaffected limb demonstrated significantly greater shoulder and elbow ROM than the affected limb, suggesting increased reliance on the unaffected side during running. This compensation was further emphasized by ROM values in the unaffected limb exceeding those of the dominant and non-dominant limbs in typically developing children. Such asymmetrical movement patterns may reflect adaptive motor strategies developed to maintain efficient running despite limitations in the affected limb. These findings highlight the importance of rehabilitation approaches that promote balanced upper-limb function, enhance motor control on the affected side, and support more symmetrical arm swing during running.

A-0673 UNDERSTANDING PERSONAL TREATMENT GOALS TOWARDS PATIENT-CENTERED HEALTHCARE FOR PATIENTS WITH HAND AND WRIST CONDITIONS

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Introduction: Treatment success in hand and wrist conditions is typically assessed using group-based thresholds such as the Minimal Important Change or Patient Acceptable Symptom State. While useful at the group level, these measures do not reflect an individual patient’s threshold for meaningful improvement or account for baseline functioning. The Personal Meaningful Gain (PMG) was developed to evaluate treatment success at the individual level. It reflects the improvement a patient aims to achieve to be satisfied in a domain they consider most important (e.g., pain or tingling), capturing their personal threshold for treatment success. Measured before the first consultation, the PMG may support expectation management and facilitate shared decision-making. Since this is a new construct, it is not yet understood how these personalized thresholds for treatment success vary across diagnoses, goal domains, and treatment types, or which factors influence PMG values.

Aim: To assess how PMG values differ across diagnoses and goal domains, compare surgical and nonsurgical patients, and identify factors independently associated with the PMG.

Materials and Methods: This prospective cohort study included patients diagnosed with thumb base osteoarthritis (TOA), trigger finger (TF), de Quervain’s tenosynovitis, and carpal tunnel syndrome (CTS). The PMG was derived from the

validated Patient-Specific Needs Evaluation. PMG values (range 0-10; higher scores indicating greater desired improvement) and goal domains were compared across diagnoses using a one-way ANOVA with Tukey-Kramer post-hoc testing, and between surgical and nonsurgical patients using a Welch's t-test. Hierarchical linear regression was used to identify factors independently associated with the PMG, including diagnoses, sociodemographic characteristics, goal domains, information needs, and mental health.

Results: A total of 5,122 patients were included (23% TOA, 35% TF, 14% de Quervain's, 28% CTS). The overall mean PMG was 5.0.

PMG values differed significantly across diagnoses ($p < 0.001$), with CTS patients reporting the greatest desired improvement (5.6 ± 2.2) and TOA patients reporting the lowest (4.3 ± 1.8). Across goal domains, patients focusing on tingling had the highest PMG (6.5 ± 2.0), followed by numbness (5.7 ± 2.6) and pain (5.3 ± 1.9) ($p < 0.001$). Pain was the most common goal for patients with TOA, TF, and de Quervain's, whereas CTS patients most often prioritized tingling.

Patients eventually undergoing surgery reported higher PMGs than those eventually treated nonsurgically (mean difference 0.64, [97.5% CI 0.51–0.77]; $p < 0.001$), suggesting that surgically treated patients already set more ambitious treatment goals before the first consultation.

In regression analysis, pain catastrophizing had the strongest association with higher PMGs ($\beta = 0.57$ [0.38 to 0.77]), while having appearance as a primary goal was associated with lower PMGs ($\beta = -1.07$ [-1.40 to -0.74]).

Conclusion: Patients with CTS, those prioritizing tingling, and those who eventually underwent surgery reported the highest PMG values, indicating more ambitious treatment goals. Pain catastrophizing independently predicted higher PMGs, whereas focusing on appearance was associated with lower PMGs. These findings provide diagnosis-specific insights into individual treatment goals and further validate the PMG as a patient-centered tool to support shared decision-making, align expectations, and guide first-time-right treatment.

A-0674 PREDICTORS OF RETURN TO WORK AFTER SURGERY FOR ULNAR NERVE ENTRAPMENT AT THE ELBOW: A PROSPECTIVE COHORT STUDY

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Introduction: Ulnar nerve entrapment at the elbow (UNE) is the second most common peripheral nerve compression disorder of the upper limb, with an estimated incidence of 20–36 per 100,000 person-years. It predominantly affects individuals of working age and may result in substantial work disability. Although Swedish national guidelines recommend up to 8 weeks of sick leave following UNE surgery, evidence on predictors of return to work (RTW) remains scarce. Retrospective data suggest associations between occupational type, smoking, and recovery time, but prospective studies including both patient-reported and clinical outcomes are lacking.

Aim: This prospective cohort study aimed to investigate the duration of sick leave and identify predictors influencing RTW following surgery for idiopathic UNE. We hypothesized that age, tobacco use, manual labour, preoperative sick leave, pain, symptom severity, and surgical technique might affect postoperative RTW.

Material & Methods: A total of 65 patients (25 women, 40 men; mean age 51 ± 16 years) undergoing primary surgery for UNE at the Department of Hand Surgery, Plastic Surgery and Burns, Linköping University Hospital, Sweden (2020–2024), were prospectively enrolled and followed for 12 months. Exclusion criteria included previous ulnar nerve surgery, conservative management only, or inability to participate in follow-up. Simple decompression was the primary procedure (57/65, 88%), while anterior subcutaneous transposition was performed in cases with nerve subluxation (8/65, 12%).

Results: Among the 49 participants constituting the working population (employed, students, or unemployed but eligible for work), the median duration of full-time sick leave was 6 weeks [IQR 4], consistent with national guideline recommendations. The duration of sick leave did not differ by age, sex, surgical technique, or preoperative symptom grade. However, occupation significantly influenced RTW: manual labourers required longer sick leave than non-manual workers (median 7 vs. 4 weeks; $p = 0.003$).

Multivariate regression identified smoking (but not snuff), manual labour, and higher preoperative pain (PRUNE-S pain subscale) as independent predictors of prolonged sick leave (all $p < 0.05$). None of the variables, including age, sex, preoperative sick leave, symptom severity, or surgical technique, were significant predictors. However, the type of surgery modified the impact of the other predictors. Postoperatively, PRUNE-S scores improved across all subscales, indicating substantial reductions in pain and disability.

Conclusions: In this prospective cohort, most patients returned to work within 6 weeks after UNE surgery. Manual work, smoking, and preoperative pain were associated with delayed RTW, highlighting the importance of individualized recovery planning. Preoperative smoking cessation and targeted rehabilitation addressing pain and occupational demands may shorten sick leave and improve functional outcomes. These findings support current national recommendations while emphasizing the need for occupation-specific guidelines in UNE management.

A-0676 IMPACT OF MYOFASCIAL MOBILIZATION ON UPPER EXTREMITY SPATIOTEMPORAL AND KINEMATICS PARAMETERS IN CHILDREN WITH CEREBRAL PALSY: A PILOT STUDY

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Introduction: In hemiplegic type cerebral palsy (CP), upper extremity functions are markedly limited due to spasticity, loss of motor control, and compensatory movement patterns. The fascial system, owing to its proprioceptive properties, plays an important role in postural control and movement coordination. It has been suggested that myofascial mobilization may enhance motor performance by improving tissue elasticity. In individuals with CP, increased fascial tension and adhesions can further restrict movement. Myofascial mobilization, by increasing the flexibility of these tissues, may positively influence muscle length, joint range of motion, and functional movements.

Aim: To evaluate the impact of myofascial mobilization on upper extremity spatiotemporal and kinematic outcomes in children with cerebral palsy.

Material & Methods: Five children with CP (5 hemiplegic; 3 boys, 2 girls; mean age: 8.4 ± 2.9 years) participated in the study. Analysis of the upper extremity was conducted using a 3D motion capture system (VICON MX, Oxford Metrics Inc., Oxford, United Kingdom) during the reaching task. A myofascial mobilization protocol was applied to the front arm by following the superficial and deep fascial lines. The intervention consisted of soft tissue mobilizations directed along the relevant myofascial tracks and bone mobilizations targeting the corresponding bony stations, complemented by gentle

stretching techniques incorporated between mobilization sequences to enhance fascial and muscular extensibility. Spatiotemporal (movement time, percentage of movement reaching and returning phases, reaching and returning times) and kinematic data (maximum and minimum of thorax, shoulder, elbow joint angles) were obtained through 3D motion analysis during the reaching task were analyzed pre and post the intervention.

Results: Individual analyses revealed an increase in maximum shoulder flexion angle, a decrease in minimum elbow flexion angle, and a reduction in maximum thorax anterior tilt after the intervention, while the kinematic curves concurrently indicated improvements in the smoothness and organization of the reaching movement pattern. The proportion of the reaching phase within the total movement decreased and approached 50%, suggesting a more symmetrical execution of the reaching and returning phases. Nevertheless, no statistically significant differences were found in spatiotemporal or kinematic parameters between pre and post myofascial mobilization ($p>0.05$).

Conclusions: Individual analyses indicated that myofascial mobilization may exert promising acute effects on upper-extremity motor patterns in children with hemiplegic cerebral palsy. In this study, the intervention primarily focused on the elbow region due to its essential role in achieving full and functional elbow extension during reaching tasks, and post-treatment observations suggested favorable alterations in joint movement strategies. Although pre-post comparisons did not demonstrate statistically significant changes in spatiotemporal or kinematic parameters, these preliminary findings highlight the potential of myofascial mobilization to enhance functional movement patterns and underscore the need for future studies with larger sample sizes and extended follow-up periods.

A-0677 PRECISION IN PRACTICE: ACCURACY OF 3D-GUIDED CORRECTIVE OSTEOTOMIES OF THE RADIUS AND ULNA Julia Glaser¹, Amr Eisa^{1,2}, Leila Harhaus¹, Martin Aman¹

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Introduction: Three-dimensional (3D) preoperative planning has become an essential tool for the correction of complex forearm malunions, enabling individualized reconstruction of anatomy. While the technique is increasingly used in clinical practice, objective validation of how precisely the surgical result matches the virtual plan remains limited.

Aim: Evaluate the accuracy of 3D-planned corrective osteotomies of the forearm using CT-based analysis of angular and translational deviations between the planned and postoperative bone alignment.

Material & Methods: Patients who underwent 3D-planned corrective osteotomy of the radius and/or ulna for extra-articular malunion were retrospectively analysed. Preoperative 3D plans were compared with postoperative CT scans obtained approximately twelve weeks after surgery. Parameters included translational and angular deviations in all planes, changes in bone length, radial inclination, palmar tilt, ulnar variance, and rotational alignment. Descriptive statistics and interobserver reliability testing were performed.

Results: Nine patients with thirteen osteotomies (nine radius, four ulna) were included. The mean absolute angular deviation between planned and postoperative fragment position was $2.7 \pm 1.8^\circ$ (range 0.6 – 5.9°), and the mean translational deviation was 1.8 ± 1.2 mm (range 0.4 – 3.7 mm). For radius corrections, radial inclination improved from $10.8 \pm 4.2^\circ$ to $22.1 \pm 3.5^\circ$, and palmar tilt from $-5.2 \pm 6.4^\circ$ (dorsal tilt) to $12.6 \pm 4.9^\circ$ (volar tilt). The axial rotational correction averaged $15.3 \pm 7.6^\circ$, reflecting substantial restoration of pronation-supination alignment.

For ulna corrections, the mean length deviation between planned and achieved correction was 1.3 ± 0.9 mm, and ulnar

variance was corrected by 2.1 ± 1.3 mm, reaching values within ± 1 mm of the contralateral side in most cases. Overall, 83% of all cases achieved deviations below 3° and 3 mm, demonstrating excellent surgical precision. Interobserver reliability was excellent (ICC = 0.98; 95% CI 0.94–0.99; $p < 0.001$). These deviations are minimal and must be regarded as highly accurate compared with conventional, non-3D-assisted corrective techniques.

Conclusions: 3D-guided corrective osteotomies of the forearm provide highly precise anatomical restoration with minimal deviation from the preoperative plan, confirming the clinical accuracy and reproducibility of 3D-based corrective surgery.

A-0678 POSTOPERATIVE OUTCOMES OF NERVE TRANSFER FOR OBSTETRIC BRACHIAL PLEXUS PALSY -RETROSPECTIVE STUDY OF INTERCOSTAL NERVE TRANSFER AND THE OBERLIN'S PROCEDURE

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Introduction: Two methods are known for reconstructing elbow flexion in patients with obstetric brachial plexus palsy using nerve transfers: an intercostal nerve-to-musculocutaneous nerve transfer (ICN) and Oberlin's procedure.

Aim: The purpose of this study was to retrospectively examine the results of the two groups performed at our hospital and compare the outcomes.

Material & Methods: The study included 11 cases of Obstetric Brachial Plexus Palsy who underwent nerve transfer surgery for elbow flexion reconstruction at our hospital between 2006 and 2025. Seven cases were in the ICN group and four in the Oberlin group. The primary endpoints were the rate of achieving MMT3 or higher and the time to achieve this, and the secondary endpoint was the final flexion angle.

Results: All seven patients (100%) in the ICN group achieved elbow flexion MMT3 or greater, compared to three out of four (75%) patients in the Oberlin group. The median time taken to achieve this was 10 months after surgery for the ICN group and six months for the Oberlin group. All seven patients in the ICN group achieved a final elbow flexion angle of 90° or more, and four of these patients achieved an angle of 120° or more. Two patients in the Oberlin group achieved a final elbow flexion angle of 120 degrees or more.

Conclusions: In nerve transfer surgery for birth palsy, elbow flexion function was achieved in both the ICN and Oberlin groups. The ICN group demonstrated consistent success rates, while the Oberlin group, despite having a smaller sample size, showed a tendency towards relatively early recovery. While there were limitations due to the small number of cases and missing data, this information is considered useful when selecting a surgical procedure.

A-0679 A SHORTER DELAY IN SUTURE REPAIR OF DIGITAL NERVE INJURIES DOES NOT AFFECT PATIENT-REPORTED OUTCOMES

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Introduction: The optimal timing for surgical repair of digital nerve injuries to obtain optimal outcome remains uncertain. While experimental data and studies on proximally located nerve injury suggest that early intervention facilitates better

regeneration, evidence for the “simple” and distally located digital nerve injuries is limited. In clinical practice, delays may occur due to logistical or resource-related constraints rather than medical indications. Understanding whether short surgical delays affect recovery is crucial for evidence-based prioritization of trauma surgery.

Aim: This study aims to evaluate whether the time from the digital nerve injury to suture repair influences patient-reported outcomes, using data from a large, nationwide cohort. We hypothesized that surgical delay would adversely impact outcome based on Patient-Reported Outcome Measurements (PROMs).

Material & Methods: This retrospective registry-based cohort study used prospectively collected data from the Swedish National Quality Register for Hand Surgery (HAKIR) between 2010 and 2022. Patients with suture-repaired digital nerve injuries in fingers or thumbs (ICD-10: S643, S644) and NOMESCO codes, indicating a suture-repaired digital nerve injury (ACB29: “suture of peripheral nerve – other or unspecified”), were included ($n = 1,665$). Exclusion criteria were reoperations, invalid injury dates, or concomitant major nerve reconstructions.

Time-to-surgery was analysed as both a continuous variable (days) and categorically stratified as 0–2 days, 3–7 days, and ≥ 8 days after injury. PROMs included the QuickDASH and HAKIR Questionnaire-8 (HQ-8), collected preoperatively and at 3 and 12 months postoperatively. Multiple linear regressions, adjusted for age, sex, injured hand, injury location (finger vs. thumb), and concomitant injuries, were used to evaluate associations between surgical timing and outcomes. **Results:** Most patients ($n = 1,281$; 77%) underwent surgery within 2 days, while 316 (19%) had surgery at 3–7 days, and 68 (4%) after ≥ 8 days. The median age of all patients was 36 [IQR 25] years, and 69% were men. Time-to-surgery did not significantly affect QuickDASH or HQ-8 scores at either 3 or 12 months postoperatively (all $p > 0.05$). Median HQ-8 symptom scores for cold sensitivity and stiffness remained high (40–50) regardless of timing.

Age, sex, injury location, and concomitant injuries had a greater impact on PROMs than timing. Older age was associated with slightly higher QuickDASH scores and pain ($p < 0.05$). Male patients reported less weakness ($p < 0.05$). Injuries located in fingers, compared to those in thumbs, resulted in increased stiffness, pain, and cold sensitivity ($p < 0.05$) among the affected patients. Increased stiffness and weakness were reported in patients with muscle and tendon injuries, while concomitant complex injuries increased QuickDASH scores and weakness. Post-hoc power analyses confirmed adequate power ($>80\%$) for most models.

Conclusions: Short surgical delays of at least one week do not negatively affect PROMs after suture repair of digital nerve injuries. Residual symptoms persist regardless of the timing of surgery. Factors such as age, sex, injury site, and concomitant injuries exert greater influence on recovery. These findings suggest that flexible surgical scheduling for digital nerve repair in resource-limited settings may be a suitable approach without compromising the patient-rated outcomes.

A-0680 OUR MAJOR REPLANTATION EXPERIENCE

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Introduction: Replantations at the level of the radiocarpal joint and above, such as wrist, forearm, transhumeral, foot or shoulder, are referred to as major replantations. Despite advances in microsurgery, there are no clear guidelines for deciding between stump repair and replantation in proximal amputations. Patients with realistic expectations and preserved limb function may be candidates for replantation.

Aim: This report presents four major replantation cases treated at our clinic, highlighting challenges encountered and solutions applied.

Material & Methods: While hand and finger replantation are common, those above the wrist remain rare, with no definitive

indications. Success in major replantations relies on a structured approach, considering the patient's condition, injury severity, ischemia time, and the type of injury. Major amputations severely affect a patient's quality of life and require long, complex surgeries, repeated interventions, and an extended recovery. Therefore, the decision to proceed should be made by an experienced surgeon with access to a skilled medical team, including emergency, ICU, anesthesia, and physical therapy specialists. The four male patients, with an average age of 33, presented with crush injuries resulting in amputations. The types of amputation were: high-level humeral amputation (patient 1), mid-forearm amputation (patient 2), and ankle-level amputation (patients 3 and 4). The Mangled Extremity Severity Score (MESS) was used to assess limb salvage potential. The MESS scores were 8, 6, 7, and 5, respectively.

Results: In patient1, sural vein graft was used to bridge a gap in the brachial artery, while in the others, primary closure was performed under a microscope without grafts. In cases involving foot and forearm amputations, orthopedic involvement allowed for bone shortening and fixation, enabling primary repair of neurovascular structures without the need for grafts, except in patient1.

Circulation in the amputated limbs remained stable in all patients, and they were closely monitored in the ICU.

However, patient1 developed complications after surgery, including deteriorating renal and vital function due to the severity of the crush injury. Despite stable circulation in the amputated limb, the patient's condition worsened, and a decision for amputation was made. In another case, after observing muscle edema and limited circulation in the amputated foot, the patient chose amputation, which was performed with stump closure. The other two patients, one with forearm replantation and one with an ankle amputation, maintained stable circulation and were transferred to the ward for rehabilitation and physical therapy.

Conclusions: Although microsurgery and replantation techniques have advanced, major limb replantation remains a challenging process. Successful outcomes depend on careful patient selection, thorough monitoring, and the ability to make swift decisions if vital functions are compromised. Replantation decisions should be approached cautiously to ensure the patient's safety and minimize risk.

A-0681 CAPAMASQUELETE: A NOVEL COMPOSITE TECHNIQUE FOR RECONSTRUCTION OF LARGE SEGMENTAL BONE DEFECTS

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Abstract: Reconstruction of significant segmental long-bone defects remains a major surgical challenge. Although advances in vascularized bone transfer and tissue engineering have improved outcomes, achieving durable mechanical stability and robust biological integration remains difficult. The Capanna and Masquelet techniques each address different components of bone reconstruction. We propose a hybrid approach—the CapaMasquelet technique—which integrates the mechanical stability of the Capanna construct with the biologically active environment produced by the Masquelet-induced membrane. This technique can be performed using either vascularized or non-vascularized bone grafts. Notably, in cases where recipient vessels are compromised, such as after extensive radiotherapy for bone tumors, the vascularized induced membrane may be sufficient to confer vascular support when non-vascularized grafts are used.

Surgical Technique: The CapaMasquelete method was applied to an average femoral diaphyseal defect of 25 cm in three patients: two with bone tumors and one with a traumatic segmental loss. All patients underwent staged reconstruction with an average interval of 9 weeks between stages. Two reconstructions used vascularized grafts, and one used a non-

vascularized graft due to the absence of suitable recipient vessels after radiotherapy.

First Stage: In the two patients with osteosarcoma, wide-margin oncologic resections removed 25 cm and 28 cm of femoral diaphysis. In the trauma patient, extensive debridement of a comminuted fracture resulted in a 24 cm defect. In all cases, the defect was filled with an antibiotic-loaded cement spacer, and stabilization was achieved using a bridging plate.

Second Stage: The vascularized induced membrane was identified and preserved to envelop the reconstruction. A vascularized fibular graft was harvested for two patients, whereas a non-vascularized fibular graft was used in the radiated patient lacking viable recipient vessels. The structural allograft was reamed to the appropriate diameter to accommodate the fibular graft, and a cortical window was created to allow passage of the vascular pedicle when applicable. After positioning the fibular graft within the allograft, microsurgical anastomosis was performed when indicated, and the vascularized membrane was wrapped around the composite construct.

Results: Cortical consolidation, when achieved, occurred at an average of 6 months. Patients progressed to full weight-bearing at approximately 12 weeks. No donor-site complications from the fibular harvest were observed.

Conclusion: This two-stage hybrid reconstruction technique appears technically feasible and holds promise for managing extensive segmental bone loss, particularly in oncologic, septic, or complex post-traumatic scenarios. The osteoinductive properties of the induced membrane may enhance graft incorporation, and the technique offers distinct advantages in cases complicated by radiotherapy or infection.

A-0682 THE LISTER'S TUBERCLE TENDERNESS (LTT) TEST FOR THE DIAGNOSIS OF OCCULT DISTAL RADIUS FRACTURES Bong Cheol Kwon¹, Jeho Lee², Dong Heon Cha¹, Si hyun Kim¹

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Introduction: Distal radius fracture is not always visible in simple radiographs, and is frequently misdiagnosed as a sprained wrist.

Aim: The purpose of this study was to evaluate the diagnostic value of the Lister's tubercle tenderness (LTT) test for occult distal radius fractures (DRFs), and to compare it with that of simple radiographs.

Material & Methods: We prospectively enrolled patients presenting with wrist pain and swelling after fall on an outstretched hand (FOOSH) who showed no clearly visible fracture line in the wrist radiographs. All these patients underwent physical examination including the LTT test, the standard wrist radiographs, and 3-dimensional computed tomography (CT) scan, which formed the reference standard for the diagnosis of occult DRFs. The wrist radiographs were presented to two examiners who determined the presence of fracture line in the initial radiographs in two different sessions with a 6-week interval. Diagnostic value of the LTT test and the wrist radiographs were calculated and compared.

Results: A total of 108 consecutive patients were included. The LTT test showed a sensitivity, specificity, positive predictive value, negative predictive value, and overall accuracy of 93.9%, 80%, 67.4%, 96.8%, and 84.3%, respectively. The wrist radiographs showed a sensitivity, specificity, positive predictive value, negative predictive value, and overall accuracy of 71.7%, 73.3%, 56.2%, 86%, and 72.5%, respectively. The LTT test is more accurate than the wrist radiographs in the diagnosis of occult DRFs, but this difference did not reach statistical significance ($P=0.09$).

Conclusions: The LTT test is highly accurate and more useful than simple radiographs for the diagnosis of occult DRF. Surgeons should be aware of the high likelihood of occult DRF in patients with positive LTT test in the setting of FOOSH injury and consider advanced imaging if necessary.

A-0684 IMPAIRED MOVEMENT IMAGERY IN RHEUMATOID ARTHRITIS AND ITS ASSOCIATION WITH PAIN: IMPLICATIONS FOR UPPER EXTREMITY REHABILITATION

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Introduction: Motor imagery is increasingly integrated into graded motor imagery and mirror therapy protocols for upper extremity rehabilitation, yet little is known about motor imagery ability in rheumatoid arthritis (RA), a condition that frequently affects the wrist and small joints of the hand and compromises fine motor control. Chronic pain, inflammation and long-standing functional adaptation in RA may alter imagery processes that underpin such interventions.

Aim: This study aimed to compare questionnaire-based movement imagery ability between individuals with RA and healthy controls, and examine clinical and psychosocial correlates of imagery within the RA group.

Material & Methods: In this cross-sectional case-control analysis, 118 adults with RA and 38 healthy controls were evaluated with a Movement Imagery Questionnaire-3. Age and sex were recorded in both groups; in RA, additional covariates included pain intensity classification (no, mild, moderate, severe), Hospital Anxiety and Depression Scale anxiety and depression (normal, moderate, significant) classifications, International Physical Activity Questionnaire category (inactive, minimally active, active), cognitive impairment (MoCA-(normal, cognitive impairment), sex, age and disease duration. Group-wise descriptive statistics were calculated. Between-group differences were tested with Welch's t-test and Wilcoxon rank-sum test. Multiple linear regression was performed, adjusting for age and sex. Within RA, associations between imagery scores and pain, HADS, IPAQ, MoCA, age, sex, and disease duration were examined using multivariable regression.

Results: Movement imagery scores differed markedly between groups. Healthy controls (n=38) had a mean total score of 72.79 (SD 10.20; median 74.00), whereas RA patients (n=118) had a mean of 16.55 (SD 3.38; median 17.40). Welch's t-test showed a highly significant between-group difference ($t=33.51$, $df=39.81$, $p<2.2\times10^{-16}$), with an estimated mean difference (Healthy – RA) of 56.21 points and a 95% confidence interval from 52.85 to 59.64. The Wilcoxon rank-sum test corroborated this result ($W=4256$, $p<2.2\times10^{-16}$). In the age- and sex-adjusted model, group remained a very strong predictor (β for RA vs Healthy -55.71 , standard error 1.10, $p<2\times10^{-16}$), and higher age was modestly associated with lower imagery scores ($\beta -0.10$, $p=0.0018$); sex was not significant. The model explained 94.9% of the variance in total imagery score (adjusted $R^2=0.948$). Within the RA cohort, the multivariable model including pain category, HADS anxiety and depression classifications, IPAQ category, cognitive impairment, age, sex and disease duration accounted for 21.1% of the variance in imagery scores (adjusted $R^2=0.142$; $F(8,92)=3.08$, $p=0.0041$). Among these covariates, only pain category showed a statistically significant association with imagery ($\beta -1.17$ per increment in VAS category, $p=0.0058$); anxiety, depression, physical activity, cognitive status, age, sex and disease duration were not independent predictors.

Conclusions: RA patients reported markedly lower movement imagery ability than healthy controls, even after age and sex adjustment. Higher pain was modestly associated with lower imagery within RA, whereas psychological status, physical activity, cognitive status, and disease duration were not. These findings support routine assessment of movement imagery before graded motor imagery interventions in hand and upper extremity rehabilitation and highlight the importance of pain modulation.

A-0685 TRAUMATIC PALMAR CARPAL INSTABILITY NON-DISSOCIATIVE (CIND) FOLLOWING A DISTAL RADIUS FRACTURE

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Introduction: Carpal instability is a complex phenomenon typically associated with pain, impaired wrist function and significant loss of quality of life. While attention has traditionally focused on carpal instability dissociative (CID), carpal instability non-dissociative (CIND) represents a distinct entity. CIND is defined by abnormal kinematics between the carpal rows without interosseous ligament injury and often manifests as a painful “clunk” during wrist motion, as a result of dysfunction of the extrinsic capsular ligaments. Recent insights suggest these ligaments act as primary stabilizers of proximal row alignment. A traumatic form of CIND has increasingly been recognized following scaphoid and distal radius fractures (DRF), characterized by palmar intercalated segment instability of the lunate in the absence of lunotriquetral (LT) or scapholunate (SL) injury. Emerging evidence indicates an association with distal radial malunion or radiocarpal fracture-dislocations, but the precise pathoanatomic mechanisms underlying traumatic CIND remain poorly understood. **Aim:** The objective of this case series is to raise awareness go traumatic palmar CIND after DRF, propose a pathomechanical sequence from initial trauma to the development of traumatic palmar CIND, and share our diagnostic and therapeutic strategy.

Materials and Methods: A retrospective single-center study was conducted to identify patients with traumatic palmar CIND after DRF between 2021 and 2025. Collected clinical and radiographic data included demographics, injury mechanism, timing of onset of palmar CIND, initial fracture management, subsequent surgical interventions, and Patient-Rated Wrist Evaluation (PRWE) scores. Inclusion criteria required palmar CIND without LT or SL disruption, confirmed intraoperatively or by arthroscopy. Traumatic palmar CIND was defined by a radiolunate angle (RLA) on a true lateral radiograph $>15^\circ$.

Results: We describe the clinical course of 7 cases of traumatic palmar CIND. 2 patients underwent salvage surgery (proximal row carpectomy and Darrach procedure and proximal row carpectomy and wrist arthrodesis), 3 patients underwent correction osteotomy, 2 patients underwent open reconstruction of the dorsal extrinsic ligaments, 2 underwent arthroscopic repair of the dorsal extrinsic ligaments, and one patient refrained from further treatment.

Conclusion: Recognition of traumatic palmar CIND following DRF is essential, as timely correction of this instability plays a critical role in restoring wrist balance and preventing progressive dysfunction. Our experience highlights a clear learning curve: isolated correction of distal radius malunion did not reliably resolve palmar CIND and, in some cases, ultimately necessitated salvage procedures. In contrast, earlier identification and repair of injured extrinsic ligamentous stabilizers appeared to yield more favorable outcomes. These findings underscore the importance of early diagnosis and targeted ligament-focused intervention in the management of traumatic palmar CIND.

A-0687 FUNCTIONAL OUTCOMES OF PATIENTS WITH TETRAPLEGIA FOLLOWING SURGICAL RESTORATION OF ELBOW EXTENSION, KEY PINCH AND GRASP FUNCTION

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Introduction: Tetraplegic patients experience significant impairment of upper limb function. One of the most critical functional deficits is the inability to actively extend the elbow. Another major challenge for these patients is the loss of

grasping ability in the hand. These deficits severely limit the performance of daily activities. Hand surgery addresses these limitations through surgical restoration of elbow extension via lower limb tendon transfer and the ALFABET procedure aimed at restoring key pinch function. Postoperative rehabilitation, guided by a dedicated protocol, plays a fundamental role in achieving optimal results.

Aim: The aim of this study was to evaluate surgical and rehabilitative strategies for restoring elbow extension powered by the triceps and improving key pinch with grasp function in individuals with tetraplegia, focusing on the functional outcomes, reliability, and clinical applicability of tendon transfers and alphabet procedure techniques.

Material & Methods: The study included 12 patients (2 women and 10 men) with a mean age of 36.2 years, all of whom had sustained high spinal cord injuries at the C4–C7 level. A total of 20 triceps reconstructions and 9 key pinch reconstructions (ALFABET procedures) were performed.

Both surgical qualification and postoperative outcome assessment were based on the “Muscle Function according to the British Medical Research Council System.” To qualify for surgery, patients were required to demonstrate a minimum strength grade of M3 — in the deltoid muscle (for triceps reconstruction) and in the extensor carpi radialis longus (for key pinch restoration).

Results: No major complications were observed. Muscle strength assessed one year postoperatively averaged grade 3 (on a 5-point scale) in all operated limbs. Elbow extension against gravity (muscle strength ≥ 3) was achieved in 85% of treated limbs. Active key pinch grip was restored in all operated wrists. The mean DASH score was 45.

Conclusions: Posterior deltoid-to-triceps tendon transfer combined with the ALFABET procedure, followed by an appropriate rehabilitation protocol, is a safe and effective surgical approach for patients with tetraplegia. It leads to meaningful improvements in upper limb function.

A-0688 FLEXOR TENDON INJURIES IN CHILDREN: A RETROSPECTIVE ANALYSIS OF 14 YEARS OF OUTCOMES

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Introduction: Flexor tendons are essential for hand function and therefore crucial for children’s motor development. Early and adequate diagnosis and treatment of pediatric flexor tendon injuries are necessary to prevent long-term complications. Outcome data in children remain limited, and pediatric injuries differ significantly from adult cases, especially regarding postoperative rehabilitation. Children demonstrate a higher healing capacity and require age-appropriate treatment approaches (Moehrlen et al., 2009; von der Heyde, 2015).

Aim: This retrospective study analyzes clinical outcomes and complication rates—such as tendon ruptures and adhesions—after flexor tendon repair in children and adolescents, considering different postoperative rehabilitation strategies and age-specific therapy concepts.

Material & Methods: A retrospective review was conducted of all patients under 18 years who underwent surgical repair of flexor tendon injuries at the Department of Plastic, Reconstructive and Aesthetic Surgery between January 2010 and April 2024. Medical records, operative reports, radiographs, and photographic documentation were examined. Patients with or without accompanying nerve, vascular, or bone injuries were included if they received primary flexor tendon repair. Baseline statistics used means and SDs for continuous variables and frequencies for categorical variables. Fisher’s exact test and the Mann–Whitney U test assessed potential risk factors. Logistic regression evaluated associations between complications and variables such as age, sex, injury type, suture material and technique, number of injured tendons, and postoperative regimen.

Results: Fifty-four patients met inclusion criteria; fifteen were excluded due to follow-up shorter than six weeks, leaving 39 patients (8 female, 31 male). Four patients (10.26%) experienced tendon rupture. Three were male adolescents aged 16–18 years, and one was a 1.5-year-old female patient. All sustained blunt trauma; three required revascularization. In all four patients with secondary tendon ruptures, two or more flexor tendons were injured. Postoperative management included early active motion (n=2), passive early mobilization (n=1), and the Kleinert protocol (n=1). Two required tenolysis due to adhesions. Logistic regression revealed no significant association between demographic or treatment variables and rupture or complication rates. Fisher's test showed a significant correlation between blunt trauma and higher complication rates.

Conclusions: Age, sex, suture material, suture technique, number of injured tendons, accompanying injuries, and postoperative regimen showed no measurable impact on rupture or complication rates. Only blunt trauma was associated with increased complications. Possible explanations for tendon rupture include insufficient splint duration and technically challenging procedures such as revascularization in very young children. Children aged 6–10 years had fewer complications, likely due to better motor skills and risk awareness, while increased rupture rates in 16–18-year-olds were not statistically significant.

Postoperative management depends mainly on age and parental adherence. The findings highlight the need for individualized, age-appropriate rehabilitation and close parental involvement to optimize outcomes in pediatric flexor tendon injuries.

A-0689 SHORT TERM OUTCOME AFTER ANAFAB RECONSTRUCTION OF THE SCAPHOLUNATE LIGAMENT COMPLEX Giuseppe Broccoli^{1,2}, Marion Muehldorfer-Fodor²

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Introduction: The ANAFAB (Anatomical Front and Back) surgical technique is a complex procedure for reconstructing the scapholunate ligament and its secondary stabilizers (scapholunate complex). In this procedure, the scapholunate ligament (SLIL), the STT ligament (STTL), the long radiolunar ligament (LRL), the dorsal capsuloscapholunate septum (DCSS) and the dorsal intercarpal ligament (DICL) are reconstructed using suture tape alone or in combination with a FCR tenodesis and the creation of five drill holes.

Aim: This study reports on the short term outcome of this unique surgical method.

Material & Methods: Ten patients (two women, eight men) with an average age of 38 years were included in this observational study. The inclusion criterias were Garcia-Elias stage IV or V scapholunate instability and a dorsal scaphoid translation (DST). Patients with arthritic changes were excluded. The follow-up period was at least 12 (12–30) months. Clinical parameters such as strength (absolute in kg and relative in %), range of motion (absolute in degrees and relative in %), pain at rest and with load (VAS 0–10), and the patients' subjectively perceived limitations in daily life using the DASH score were recorded.

Results: At the minimum of twelve months postoperatively, all 10 patients were satisfied with the outcome of the operation and would do the operation again. 10 of 10 patients were able to return to their usual jobs without restrictions, and all 10 patients were able to pursue their hobbies and sporting activities as before trauma. The average pain level at rest was 0.1 VAS points (range 0–1) and with loaded grip 0.3 VAS points (range 0–2). The average range of motion of the affected wrists reached an absolute value of 68° for extension and 54° for flexion (range 50–70°). Furthermore, the 10 patients achieved an average value of 39 kg (range 20–65 kg) for absolute grip strength, which corresponded to a relative grip

strength of 85% (range 59-114%) compared to the uninjured side. The average DASH score was 7 points (range 0–26).
Conclusions: Although the ANAFAB reconstruction is a very complex technique, it leads to reliable pain reduction and increased resilience of the injured wrist over a follow-up period of at least 12 months, as well as high patient satisfaction with minimal restrictions in daily activities. Medium- and long-term results remain to be seen, however.

A-0690 FORMATION OF A LOCAL AMYLOIDOSIS NETWORK DUE TO AN UNEXPECTED PREVALENCE OF CARDIOORTHOPEDIC PATIENTS IN A HAND SURGICAL SETUP - A GERMAN PERSPECTIVE

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Introduction: Non-cardiac amyloid deposits are precursors of cardiac amyloidosis, which was found a significant cause of heart failure. Early treatment can improve survival rates.

Aim: To determine the prevalence of amyloid soft tissue depositions in ligamentous structures of the hand, this prospective study examined histologic samples, obtained in a high number of patients during surgical treatment for carpal tunnel syndrome, trigger finger and de Quervain's tenosynovitis.

Material & Methods: All patients with diseases mentioned above and undergoing a ligamentous surgical release in a single German Hand Center between 2021 and 2023, had offered to analyze a ligamentous tissue sample from the transverse carpal ligament, the A1 pulley or the 1st extensor compartment retinaculum to assess the presence of amyloid soft tissue depositions. The tissue samples were initially processed using Congo Red staining and green light polarization in a local pathological institute. If the result was positive for amyloid, subtyping of the amyloid was carried out in a special university laboratory using a specific immunohistochemical amyloid antibody panel.

Results: Out of 1884 patients, undergoing one of the index surgeries, a total of 1713 patients could be included in this prospective study and had histopathological soft tissue analysis. 230/1713 samples showed amyloid positive in the Congo red strain, leading to an amyloid prevalence of 13.4%. Among them, 210/230 were ATTR positive (91.3%), 5/ 230 were Fibrinogen Amyloid positive (2.2%), 5/ 230 were AL Amyloid (light chain amyloid) positive (2.2%). 3/ 230 were fibrinogen + ATTR positive (1.3%).

Conclusions: ATTR-derived fibrils were observed much more commonly than other amyloid fibrils. The high prevalence of amyloid positive patients revealed unexpected obstacles in the consecutive diagnostic and therapeutic medical care and led inevitably to forming a local amyloidosis network in Bremen.

A-0691 TREATMENT OF HAND PYODERMA GANGRENUM WITH FREE FLAP TRANSFER AND SYSTEMIC CORTICOSTEROID THERAPY – CASE REPORT AND LITERATURE REVIEW

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Introduction: Pyoderma gangrenosum (PG) is an ulcerative skin disease with an autoimmune involvement, classified among neutrophilic dermatoses, although its pathogenic mechanisms remain poorly understood. The most commonly affected areas are the face and lower limbs.

Aim: The aim of this paper is to highlight the management of an ulcerative, infiltrative cutaneous lesion with suprapariosteal extension and tendon involvement—diagnosed as PG—located on the dorsal aspect of the hand. We also present a literature review focusing on upper-limb PG involvement.

Material & Methods: A 55-year-old female patient, known with facial Pyoderma gangrenosum and previously treated surgically multiple times—including a facial reconstruction with a radial free flap—presented with a 5/6 cm ulcerative lesion on the dorsum of the hand, associated with destruction of the IV–V extensor tendons. Reconstruction of the soft tissue and tendons was achieved using a free anterolateral thigh flap combined with a fascia lata extension. Surgical treatment was complemented by systemic corticosteroid therapy with prednisone.

Results: We successfully restored soft-tissue coverage and tendon continuity of the IV–V fingers, with no recurrence of ulceration or wound dehiscence at the hand level. The literature describes PG as a difficult and recurrent condition, but corticosteroid therapy significantly reduces recurrence rates.

Conclusions: Reconstructive microsurgery of the upper limb in patients with PG, when combined with perioperative corticosteroid therapy, can ensure successful management of this challenging pathology.

A-0692 FREE MEDIAL FEMORAL CONDYLE (MFC) VASCULARIZED BONE FLAP FOR LARGE TRAUMATIC BONE LOSS AROUND THE PROXIMAL INTERPHALANGEAL JOINT

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Introduction: Segmental bone loss of the finger poses a major reconstructive challenge, particularly when combined with soft tissue defect and compromised finger circulation, as well as the need to restore functional motion of the finger.

Aim: We present a case of a post traumatic left middle finger segmental bone loss that was successfully reconstructed with a vascularized free medial femoral condyle (MFC) flap.

Materials and Methods: A 57-year-old right-hand-dominant male sustained a high-energy crush injury to his left hand following a motorbike accident. In particular, the left middle finger was unstable due to a highly comminuted middle phalanx fracture and has associated devitalized dorsal skin. He underwent initial debridement and temporary bony stabilization with axial Kirschner wires and cement spacer to the middle finger. His surgery was staged where surgical fixation of the multiple closed metacarpal fractures was performed alongside wound preparation for the middle finger. In the definitive surgery, a two team approach was employed. The donor site harvest was performed on the ipsilateral lower limb, where a corticocancellous medial femoral bone graft measuring 2 x 2 cm was harvested along with its descending genicular artery transverse branch pedicle. For the finger, the bone defect size encompassed the entire middle phalanx measuring 2 x 1.5cm. The PIPJ joint was not suitable for reconstruction due to multifragmentary comminution of the P2 base. The ulnar digital artery (UDA) was transected at the level of PIPJ was used as the donor vessel. Inset of the bone was performed by fusion to the proximal phalanx using a 1.5mm plate and screw construct at a 40 degrees angle. Microvascular anastomosis was performed with 1 artery and 1 vein and the remaining small dorsal defect was skin grafted. Post operative, the finger was protected in a splint and allowed on gentle active range of motion exercises at the MCPJ. **Results:** This MFC flap healed with radiological union by 5 weeks. There were no flap or donor site complications. At 10 weeks, the middle finger MCPJ active range of motion was 0 - 70 degrees and the PIPJ was ankylosed at 40 degrees. He required a corrective osteotomy of the index finger metacarpal at 12 weeks as it was scissoring into the index finger. At 5 months of injury, he has satisfactory finger motion and was able to return to light work.

Conclusion: The MFC vascularized bone graft is an effective option for reconstructing segmental phalangeal bone loss,

with the advantage of providing a biologically robust reconstruction for expeditious bony union, good donor to recipient vessel size match, and m

A-0693 COMBINED DISTAL RADIUS AND ULNA FRACTURES: A NEW CANDIDATE AMONG FRAGILITY FRACTURES? Linnea Arvidsson¹, Gabriel Axelsson¹, Sofia Christiansson¹, Marcus Landgren², Anna Kajsa Harding¹, Antonio Abramo³, Magnus Tägil¹

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Introduction: Combined distal radius and distal metaphyseal ulna fractures (DRUFs) predominantly affect elderly women and remain relatively poorly studied, likely due to their low incidence. Approximately 5% of all distal forearm fractures, involve a combined distal radius and concomitant distal ulna fracture (excluding fractures of the ulnar styloid). Prior research has shown that DRUFs are associated with poorer patient-reported outcomes, with a twofold increased odds of a poor 1-year result (DASH >35) compared with isolated DRFs. Existing literature suggests that no standardized treatment approach exists and that surgical fixation may be challenging due to osteoporosis. Distal radius fractures are well established as one of the most common fragility fractures. However, because the DRUF subgroup is so poorly characterized, the true prevalence and severity of osteoporosis in these patients remains unknown.

Aim: To test our hypothesis that patients with DRUFs have a higher prevalence and greater severity of osteoporosis compared with patients with isolated distal radius fractures.

Material & Methods: A cohort of 200 DRUF patients was identified from the XX Distal Radius Fracture Registry (patients registered between 2003 and 2018). From the this registry, 200 age- and sex-matched controls with isolated DRFs were randomly selected. For all patients, we determined whether a Dual energy X-ray Absorptiometry (DXA) scan had been performed within 365 days of the fracture date.

Results: After matching, each group consisted of 25 men and 175 women, with no difference in mean age between groups. DXA data to measure the patients bone mineral density (BMD) were available for 45 patients in the DRUF group (1 man; mean age 69 years, SD 9) and 40 patients in the DRF-only group (5 men; mean age 68 years, SD 9). There were no significant differences in mean age or sex distribution among those who completed DXA.

Comparing patients with available DXA results, mean BMD was significantly lower in the DRUF group (mean difference -0.74, SD 0.23; 95% CI -1.20 to -0.28; $P = 0.002$). Osteoporosis (T-score ≤ -2.5) was present in 32 of 45 DRUF patients (71%) compared with 12 of 40 DRF-only patients (30%) ($P < 0.001$).

Conclusions: Patients with DRUFs demonstrated both a significantly higher prevalence of osteoporosis and more severe reductions in BMD compared with patients sustaining isolated distal radius fractures. These findings suggest that underlying osteoporosis may be a key contributor to the injury pattern in DRUFs and should be actively considered in clinical evaluation and management.

A-0694 THE OPEN FRACTURE OF ELDERLY WOMEN: A COHORT STUDY OF OPEN DISTAL RADIUS AND ULNA FRACTURES

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Introduction: Combined distal radius and distal metaphyseal ulna fractures (DRUFs), are relatively uncommon, representing approximately 5% of all distal forearm fractures and predominantly affect elderly women. Previous studies have demonstrated that DRUFs are associated with poorer outcomes than isolated distal radius fractures (DRFs), regardless of fracture classification, age, sex, or comorbidities. Open fractures also appear more frequent in this subgroup, despite most injuries being low-energy in nature. The XX Distal Radius Fracture Registry enables detailed study of this rare patient population.

Aim: To describe treatment approaches, complications, and functional outcomes measured by the 1-year patient-reported Disabilities of the Arm, Shoulder and Hand (DASH) score in patients with open combined distal radius and ulna fractures. **Material & Methods:** All patients with a DRUF between 2003 and 2018 were identified through the XX Distal Radius Fracture Registry, a regional quality registry which includes one-year DASH scores. A retrospective chart review classified open injuries according to the Gustilo–Anderson classification and documented the trauma energy level, treatment methods, antibiotic use, and complications.

Results: Among 259 identified DRUF patients, 41 (16%) sustained open fractures. The mean age was 76 years (SD 14, range 32–98), and 37 (90%) were women. Twenty-five patients underwent surgery, of whom 17 (68%) sustained open reduction and internal fixation of both the radius and ulna.

Thirty-one patients (76%) completed the one-year DASH questionnaire, yielding a median score of 29 (IQR 7–43). According to the Gustilo–Anderson classification, 35 fractures were grade I, five grade II, and one grade III (a <1 cm wound but considered high energy). Thirty-five injuries were low-energy, five intermediate-energy, and one high-energy.

Initial intravenous antibiotics were administered in 32 cases. Four patients received only oral antibiotics, without any preceding intravenous administration. One patient received no antibiotics, and information was missing in four cases. Two patients had arterial injuries. Three patients had persistent ulnar nerve impairment, including one with motor involvement. No patient developed an infection.

Four patients underwent unplanned reoperations, all involving removal of osteosynthesis material; in one case, a symptomatic non-union was treated simultaneously. One additional patient developed a symptomatic non-union after plate fixation of both bones but declined further surgery.

Conclusions: Open DRUFs are relatively frequent within this fracture pattern and are typically caused by low-energy mechanisms, with Gustilo–Anderson type I being the most common. Antibiotic use was extensive, and no infections occurred. Vascular and nerve injuries were present in a subset of cases (12%). Functional outcomes were modest, reflected by a high median DASH score. Open DRUFs appear to represent “the open fracture of elderly women”.

A-0696 PAIN MODULATION THROUGH MIXED REALITY: EFFECTS OF VIRTUAL THERMAL STIMULI ON PAIN PERCEPTION IN CRPS - PRELIMINARY RESULTS

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Introduction: Complex Regional Pain Syndrome (CRPS) is a chronic neuropathic pain condition that typically affects one limb and is characterized by burning, stabbing, or pressure-like pain, sensory and motor dysfunction, and skin or trophic changes. The condition is often aggravated by thermal and psychological factors, making it a promising model for studying sensory modulation through immersive technologies. Extended Reality (XR) environments offer novel ways to modulate sensory perception and affective states. By simulating thermal sensations such as fire, ice, or gel through audiovisual cues, XR may induce thermal illusions capable of altering physiological responses and subjective pain perception without external physical stimuli.

Aim: This exploratory study aimed to evaluate whether visually and auditorily simulated thermal stimuli projected onto the hands can elicit measurable physiological and psychological responses in both healthy participants and CRPS patients. A secondary objective was to identify whether XR-induced thermal illusions could alter perceptual or pain thresholds and thus inform future pain modulation strategies.

Material & Methods: 40 healthy adults and 8 CRPS patients (screened n=16) participated in a randomized crossover design. Each participant was exposed to three XR conditions (fire, ice, and gel) presented through immersive audiovisual simulation. Physiological measures included tissue oxygenation (StO₂) assessed with optical sensors (O₂C) and hyperspectral imaging (TIVITA), skin conductance (GSR), pulse, near-infrared perfusion index, and hemoglobin concentration. Quantitative Sensory Testing (QST) determined thermal detection and pain thresholds. Subjective responses were evaluated using the State-Trait Anxiety Inventory (STAI), Simulator Sickness Questionnaire (SSQ), a presence questionnaire, and a user feedback survey. All data were analyzed using linear mixed models adjusted for ambient temperature and session order.

Results: Across all XR conditions, significant time-dependent changes were observed in physiological parameters such as StO₂, perfusion, and GSR (p<0.001). After correction for environmental factors, no consistent main effects between fire, ice, and gel remained, though perceptual threshold modulation was observed, while pain thresholds were not significantly affected. Psychological data revealed that all XR exposures significantly reduced state anxiety (p<0.05). The fire condition induced the highest presence scores and the lowest simulator sickness ratings compared to the other stimuli (p<0.05). In CRPS participants, similar but more pronounced physiological responses occurred, particularly in measures of microcirculation and oxygenation, suggesting heightened sensitivity to XR-based illusions.

Conclusions: XR environments can effectively modulate affective and sensory states, leading to measurable physiological alterations and anxiety reduction. The illusion of thermal stimulation alone appears sufficient to engage cortical mechanisms of altered body perception, supporting the concept of cognitive and emotional re-contextualization of pain. These findings highlight the therapeutic potential of XR for conditions such as CRPS, where central and peripheral sensitization play major roles. Future studies should include optimized measurement protocols, larger patient cohorts, and integration of EEG-based real-time feedback to enable self-regulated control of virtual stimuli. Such closed-loop XR paradigms could represent a non-invasive, patient-empowering approach to individualized pain modulation and neurorehabilitation.

A-0697 POSTOPERATIVE FINGER RANGE OF MOTION FOLLOWING SURGICAL REPAIR OF PROXIMAL INTERPHALANGEAL JOINT COLLATERAL LIGAMENT INJURIES

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Introduction: Proximal interphalangeal (PIP) joint collateral ligament injuries that cause joint instability frequently result in the loss of postoperative PIP extension. Although several previous studies have evaluated the factors associated with postoperative PIP joint range of motion (ROM), only a few have examined distal interphalangeal (DIP) joint ROM and the percentage of total active motion (%TAM).

Aim: The purpose of this study was to retrospectively investigate postoperative PIP joint ROM, DIP joint ROM, and %TAM in patients who underwent ligament repair for PIP joint collateral ligament injuries, and to identify the factors influencing these ROM outcomes.

Material & Methods: We included 29 patients who underwent surgery at a single institution between 2014 and 2024, excluding those with concomitant extensor tendon rupture or intra-articular PIP fractures, and who were followed-up for at least 6 weeks postoperatively. There were 18 men and 11 women, with a mean age of 39.2 years (range, 15–81 years). The injured finger was the index in 2 cases, middle in 7, ring in 11, and little in 9, occurring predominantly in ulnar digits; all were acute radial collateral ligament ruptures. PIP joint dislocation at the time of injury was present in 10 cases (nine dorsal and one volar). Six cases had small bony fragments (five volar plate avulsion fractures and one chondral injury to the proximal phalangeal head). The site of the ligament rupture was the proximal attachment in 27 cases, midsubstance in one, and distal attachment in one. Midsubstance tears were treated with direct suture repair, whereas avulsion-type tears at the attachment site were treated using a suture anchor or non-absorbable sutures passed through the bone tunnels. The PIP joint was temporarily fixed with a Kirschner wire for 1.5–2 weeks, after which active PIP and DIP motion exercises were initiated under buddy taping. At the final follow-up, the PIP and DIP ROM and %TAM were evaluated, and their relationships with age, time from injury to surgery, preoperative stress-test joint opening, PIP dislocation at injury, presence of volar plate avulsion fracture, injury to the lateral band, residual pain, injured finger, and mechanism of injury were analyzed.

Results: At final follow-up, the mean ROM was PIP extension/flexion $-10.3^\circ/94.0^\circ$ and DIP extension/flexion $4.3^\circ/66.0^\circ$. Mean %TAM was 96.2%. The PIP flexion angle, DIP extension and flexion angles, and %TAM all showed significant negative correlations with age ($p < 0.05$), indicating poorer ROM in older patients. PIP extension tended to worsen with age, although this did not reach statistical significance, and some younger patients had a residual PIP extension lag. None of the other evaluated factors showed a significant association with the ROM.

Conclusions: In surgically treated PIP joint collateral ligament injuries of the finger, older age was associated with reduced PIP flexion angle and diminished DIP ROM, suggesting that aging may be an important factor contributing to postoperative limitation of finger motion.

Keywords: proximal interphalangeal joint, collateral ligament injury, finger range of motion, surgical repair, total active motion, age factors

A-0698 SYSTEMATIC REVIEW ON THE EFFECTIVENESS OF DISTAL NERVE TRANSFERS IN FOREARM AND HAND FOR PERIPHERAL NERVE INJURIES

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Introduction: Nerve transfer surgery has become a popular alternative for management of peripheral nerve injuries in the last two decades. Although initially developed for brachial plexus injuries, they are now widely used for lesions below the elbow as well. A range of distal nerve transfer techniques have been described in the forearm and hand. The lack of high-level evidence, particularly within traumatic peripheral nerve injuries in the adult population, remains the main limitation when assessing the true effectiveness of distal nerve transfers below elbow. Main questions remain regarding the optimal timing for transfer post-injury, the extent of motor recovery when comparing different donor and recipient sites, and overall outcomes when compared to conventional grafting or tendon transfers. To address these identified gaps in the literature, this systematic review was undertaken to synthesize all available evidence on distal nerve transfers performed at or below the elbow for adult patients with nerve injuries, with a specific focus to the reported motor outcomes.

Aim: To systematically review and analyse the literature on distal nerve transfers performed below the elbow in peripheral nerve and brachial plexus injuries.

Material & Methods: This systematic review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. PROSPERO registration number CRD42025644616). We performed a systematic electronic database search in Pubmed, Medline, SCOPUS, and Cochrane Library including all studies from their inception to February 6, 2024. We used search terms utilising nerve transfer and “brachial plexus”, “radial nerve”, “median nerve”, and “ulnar nerve”. We included studies of distal nerve transfers undertaken in the forearm or hand for adult patients (those 16 years or older) with peripheral nerve injuries where a motor nerve or fascicle was transferred and coapted to a distal denervated nerve target.

Results: Our initial search yielded 6,275 citations. Of the 68 articles deemed potentially relevant, 44 citations met the inclusion criteria for qualitative synthesis. Data from a total of 339 adult patients undergoing 402 distal nerve transfers below the elbow were included. We identified 142 patients who had nerve transfers to restore wrist extension, 131 distal nerve transfers for finger extension, 83 distal nerve transfers were identified for the restoration of ulnar nerve function and 46 distal nerve transfers done for restoring median nerve function. Of all the distal nerve transfers for wrist extension 78.1% patients had MRC grade M4 or more recovery, 53.4% achieved functional recovery of MRC grade M4 or greater for finger extension. 80.5% achieved MRC grade M3 or more greater in finger abduction following distal nerve transfers to motor branch of ulnar nerve. 55.6% achieved MRC grade M4 or higher recovery in both flexor digitorum profundus to the index finger (FDP IF) and flexor pollicis longus (FPL) function following transfers to AIN. Following AIN transfers 86.9% (40/46 cases) achieved MRC grade M3 or higher recovery for the respective target muscle groups.

Conclusions: Distal nerve transfers enables faster reinnervation of the target muscles and allows for independent muscle activation—benefits that cannot be achieved by traditional tendon transfers.

A-0699 ENHANCING DISTAL AIN-TO-ULNAR MOTOR NERVE SUPERCHARGE THROUGH A SINGLE-INCISION STRATEGY INCORPORATING LACERTUS FIBROSUS AND CUBITAL TUNNEL RELEASE

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Background: The understanding of multiple compression neuropathy syndromes has advanced in recent years, improving both clinical assessment and diagnostic accuracy. Concomitant nerve compression—such as Lacertus Syndrome (LS) and cubital tunnel syndrome (CuTS)—is increasingly recognized and not uncommon. In patients with chronic CuTS, distal anterior interosseous nerve (AIN) transfer may be required to augment the ulnar nerve's motor function. Adequate AIN fascicular integrity is essential for a successful transfer, and this can be optimized by decompressing the proximal median nerve through lacertus fibrosus release, which helps preserve and enhance AIN functional capacity. We propose a Single-Incision Strategy incorporating the Lacertus Fibrosus and Cubital Tunnel Release to improve the distal AIN-to-Ulnar Motor Nerve Supercharge.

Surgical technique: To release the Lacertus Fibrosis using the classical surgical incision for cubital tunnel syndrome, an incision is made between the medial epicondyle and olecranon. After reaching the brachial fascia, the skin and subcutaneous tissue are raised as a one-flap off the fascia. The lacertus fibrosis, identified as a thick rectangular or trapezoid structure attached to the brachial fascia, is then incised to expose the median nerve beneath it.

Conclusion: Releasing the lacertus fibrosus in patients with cubital tunnel syndrome who may require distal AIN nerve transfer enhances the availability and functional integrity of the AIN fascicles for successful transfer. In addition, as we advance towards the concept of multiple compression neuropathy, it is crucial to minimize surgical incisions to reduce pain, wound breakdown, scar formation, traction neuropathy, neuroma formation, and unsatisfactory aesthetic outcomes.

A-0700 ACHIEVING JOINT BALANCE: LRTI OUTCOMES IN TRAPEZIOMETACARPAL OSTEOARTHRITIS

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Thumb trapeziometacarpal (TM) osteoarthritis is a common degenerative hand disorder with multifactorial causes, leading to pain, functional limitations, and reduced quality of life due to secondary complications. Its prevalence is about 15% in women and 5% in men. Although early symptoms may be mild, patients often progress to significant pain, thumb weakness, instability, and impaired hand function. Conservative treatment includes splinting, NSAIDs, physiotherapy, and corticosteroid injections; however, surgery is considered when these measures fail to provide adequate relief.

Several risk factors—including obesity, heavy physical activity, repetitive thumb use, carpal tunnel syndrome (CTS), and family history—have been associated with increased TM osteoarthritis incidence. Anatomically, the TM joint has a biconcave–convex saddle configuration enabling multiaxial movement, supported by sixteen ligaments, five of which act as major stabilizers. Diagnosis is primarily clinical and must be distinguished from conditions such as flexor carpi radialis (FCR) tendinitis, De Quervain tenosynovitis, inflammatory arthritis, rheumatoid arthritis, and gout. Radiographic evaluation is essential for staging, with the Eaton and Burton classifications most commonly used.

Conservative treatment should be initiated at all stages. Early disease may respond well to splinting and physiotherapy, whereas advanced stages may require surgical reconstruction to reduce pain and improve strength and mobility. Surgical options for early stages include arthroscopy, metacarpal extension or abduction osteotomy, and volar ligament reconstruction. For later stages, common procedures include trapeziectomy, trapeziectomy with ligament reconstruction

and tendon interposition (LRTI), prosthetic arthroplasty, and TM arthrodesis. LRTI aims to fill the post-trapeziectomy space with tendon tissue, prevent thumb shortening, and restore joint stability. Numerous modifications exist; the present study used the Burton and Pellegrini technique.

This retrospective study evaluated 20 patients treated with LRTI between 2020 and 2023. Thirteen were female and seven were male, with a mean age of 48 years for women and 62.8 years for men. In 75% of cases, symptoms involved the right thumb. CTS was present in 20% of patients. The mean BMI was 28.5 kg/m². Additional carpal fixation was performed in 50% of cases. Radiographically, 20% were Eaton stage IV, 40% stage III, 30% stage II, and 10% stage I. Mean preoperative pain score was 7.2/10, improving to 3.3/10 at three months. Improved thumb motion was reported by 85% of patients. Female predominance in this cohort was higher than previously reported. The elevated average BMI supports the association between obesity and TM osteoarthritis. Most patients presented at advanced stages, suggesting delayed medical consultation. All operations were performed using the Burton and Pellegrini LRTI modification, with K-wire stabilization in half of the cases. Four patients had concurrent CTS treated simultaneously. No postoperative early complications were observed. All patients received postoperative splinting for 2–3 weeks and physiotherapy.

Despite the small sample size and lack of objective functional scoring, clinical outcomes were satisfactory. Pain decreased by more than 50% on average, and most patients reported improved thumb mobility. Since the thumb contributes nearly 40% of overall hand function, early recognition and management of TM osteoarthritis are crucial. LRTI remains a reliable surgical option, especially when combined with appropriate conservative treatment.

A-0701 RESULTS OF NERVE TRANSFERS IN TRAUMATIC BRACHIAL PLEXUS LESIONS

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Introduction: Traumatic lesions of the brachial plexus lead to complex patterns of paralysis with massive loss of function in the upper extremity.

Aim: The aim of this study was to systematically analyse the potential of extraplexal nerve transpositions to restore central arm functions, particularly elbow flexion, shoulder abduction and anteversion. Particular attention was paid to functional outcomes and the influence of patient- and intervention-related factors.

Material & Methods: In a monocentric collective, 79 extraplexal nerve transfers were performed in 40 patients with traumatic plexus lesions. Elbow flexion was primarily reconstructed using intercostal nerves (n=19), Oberlin transfers (n=14) and phrenic transfers (n=1). Shoulder function was restored via transfers of the accessory nerve to the suprascapular nerve (n=21) and axillary nerve (n=1), intercostal nerves (n=14) and Somsak techniques (n=9). Functional results were documented after a median follow-up of 4.1 years using MRC scores and degrees of movement.

Results: In 85.2% of cases, active elbow flexion against gravity (MRC 3–4+) was achieved, with a median range of motion of 110° [IQR 90–120°]. 81.5% achieved functional shoulder abduction (median 40°) and anteversion (median 45°). Overall, 67.5% of patients achieved combined elbow and shoulder function – a crucial step towards regaining the ability to use their arms in everyday life. Patient age and surgical latency (<1 year) had a significant influence on the outcome: younger patients with short latency achieved significantly higher strength grades and ranges of motion.

Conclusions: Extraplexal nerve transpositions enable not only the restoration of isolated motor functions, but also the targeted reconstruction of complex motor units – from powerful arm lifting to dynamic elbow flexion. Our results underscore the enormous potential of microsurgical reconstruction techniques in a plexus surgery centre setting – especially with early intervention and individualised technique selection.

A-0702 DORSAL ULNAR ARTERY PROPELLER FLAP: SURGICAL TECHNIQUE AND CLINICAL OUTCOMES

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Introduction: Complex defects of the hand that expose tendons, bone, or neurovascular structures frequently require flap reconstruction. The dorsal-ulnar flap is a fasciocutaneous flap based on the dorsal branch of the ulnar artery, first described by Becker and Gilbert in 1988. In its original description, the pedicle is not isolated, but the flap retains a cutaneous and subcutaneous base that includes the vascular axis, thus limiting its movement and arc of rotation. In this study we propose a modification of the classical flap, with the skeletonization of the vascular pedicle up to its origin from the ulnar artery and the harvesting of a propeller flap. This approach allows for greater mobility, which is useful for the reconstruction of the palmar and dorsal surfaces of the hand, extending to the metacarpophalangeal joints.

Aim: Evaluate the validity of the revisited dorsal-ulnar flap, with vascular pedicle skeletonized up to its origin from the ulnar artery, for the reconstruction of small- to medium-sized hand and wrist defects.

Material & Methods: We conducted a retrospective study on all patients who underwent reconstruction using the dorsal ulnar artery propeller flap between January 2014 and January 2022. The study included 12 patients; we described our surgical technique and reported the clinical outcomes, flap survival, and complications.

Results: The average follow-up was 18 months. No major complications or complete flap necrosis were observed. Furthermore, no functional deficits were observed in the patients, and donor site morbidity was minimal.

Conclusions: The dorsal ulnar artery propeller flap represents a valuable option for reconstructing small- to medium-sized defects of the hand and wrist that involve the volar and dorsal surfaces up to the metacarpophalangeal joints.

A-0703 COMPARATIVE EVALUATION OF HAND BALANCE IN PATIENTS WITH ULNAR AND/OR MEDIAN NERVE INJURIES

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Introduction: Hand function is maintained through a delicate balance between skeletal stability, joint congruence, intrinsic–extrinsic muscle interaction, and sensory feedback.

The ulnar and median nerves are the key structures that govern both the motor and sensory components of this balance. While the ulnar nerve controls most intrinsic muscle functions, the median nerve plays a critical role in thumb opposition and fine motor skills.

A comparative evaluation of which components of hand balance are affected, and to what extent, following injuries to these nerves is essential for objectively monitoring surgical recovery and guiding postoperative rehabilitation.

Aim: The aim of this study was to compare motor, sensory, and functional components of hand balance among patients with isolated ulnar, isolated median, and combined ulnar–median nerve injuries after microsurgical repair.

Material & Methods: Thirty patients (ulnar n=10, median n=10, combined n=10) who underwent primary nerve repair were evaluated at least six months postoperatively.

Motor balance was assessed using Froment's, Jeanne's, Egawa, and opponens tests.

Sensory balance was evaluated with static two-point discrimination and Semmes–Weinstein monofilament tests.

Functional balance was analyzed using the Purdue Pegboard, Nine-Hole Peg Test, and Jamar dynamometer.

Proprioceptive control was examined through finger position matching with eyes closed.

Results: The ulnar nerve group showed significantly reduced pinch strength ($p<0.01$) and positive Froment's and Jeanne's signs, indicating intrinsic muscle imbalance.

The median nerve group demonstrated weaker thumb opposition and slower pegboard performance ($p < 0.05$). Combined injuries presented the most pronounced impairment in both sensory discrimination (>10 mm) and functional coordination.

A positive correlation was found between sensory recovery and fine motor performance ($r = 0.72$).

Conclusions: Patterns of nerve injury distinctly affect hand balance.

Ulnar lesions primarily disturb intrinsic motor equilibrium, whereas median lesions compromise sensory feedback and dexterity.

Comprehensive testing that integrates motor, sensory, and proprioceptive parameters provides an objective approach for evaluating functional recovery following peripheral nerve repair.

A-0704 3D ANALYSIS OF COMPLICATIONS IN DRUJ PROSTHESES AND ITS ROLE IN REVISION SURGERY: A CASE SERIES OF THREE PATIENTS

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Introduction: Distal radioulnar joint (DRUJ) prostheses inevitably alter the native biomechanics of forearm rotation, an effect that becomes more apparent after complications such as periprosthetic fractures, malunions, or prosthetic loosening. Malalignment or changes in ulnar and/or radial geometry often result in pain, restricted motion, and mechanical dysfunction. Accurate assessment of DRUJ prosthesis alignment in situ is technically challenging, as conventional imaging provides limited three-dimensional detail. Three-dimensional (3D) imaging and reconstructions enable precise alignment analysis, eliminate projection errors, and allow quantitative measurements. These methods support improved diagnosis and facilitate accurate planning of subsequent treatment, including the use of patient-specific surgical guides.

Aim: In this case series, we propose a 3D methodology to analyze DRUJ prosthetic alignment, identify implant-related complications, support clinical decision-making, enhance preoperative planning, and increase surgical control through patient-specific surgical guides.

Material & Methods: Three female patients (aged 37, 55, and 68 years) presenting with pain and restricted range of motion (ROM) after complications of DRUJ prostheses were included. Bilateral forearm CT data were converted into 3D models. Quantitative 3D analyses were performed to compare DRUJ alignment between the affected and contralateral sides. The in silico analyses included pronation–supination ROM, maximal radial bowing (MRB), location of maximal radial bowing (LMRB), radial inclination (RI), and volar tilt (VT). Kinematic simulation of the ulnar and radial components was used to detect mechanical interference. When indicated, patient-specific surgical guides were designed for revision surgery.

Results: 3D analysis identified distinct geometric abnormalities of the radius as well as deviations in implant positioning: Case 1: The distal radius showed abnormal VT of -31.2° (vs 14.0° contralateral) due to dorsal malunion after a periprosthetic radius fracture at the level of the radial component fixation pin. A 3D-planned corrective osteotomy with patient-specific guides restored normal volar tilt.

Case 2: Increased RI (25.9° vs 20.9°) and VT (20.8° vs 8.9°), combined with severe cortical bone loss and increased MRB (14.1% vs 8.2%), suggested substantial deformity. 3D reconstruction revealed insufficient radial bone stock not visible on conventional imaging, leading to a decision for conservative management.

Case 3: Severe restriction of pronation (10° vs 90° contralateral) was caused by reduced MRB (2.4% vs 6.8%) and a

proximal shift in radial bowing (36.2% vs 54.6%), resulting in midshaft impingement. A 3D-planned osteotomy with patient-specific guides restored radial bowing and improved ROM.

Conclusions: 3D imaging and reconstruction enable accurate assessment of DRUJ prosthesis alignment and implant-related complications, providing critical information for clinical decision-making. Integration of virtual analysis and patient-specific instrumentation enhances surgical precision and supports more predictable outcomes in complex wrist reconstruction.

Keywords: DRUJ prosthesis, complications, 3D technology, revision surgery, wrist surgery

A-0705 INTERTENDINOUS CROSSOVER OF THE WRIST EXTENSORS: ANATOMICAL FEATURES AND BIOMECHANICAL EVALUATION

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Introduction: Intertendinous connections between the wrist extensor tendons are rare anatomical variations, but may influence the balance of wrist extension, radial deviation and surgical tendon transfer outcomes. The coexistence of both classical crossover patterns between extensor carpi radialis longus (ECRL) and extensor carpi radialis brevis (ECRB) has not been described to date. Understanding their biomechanical impact is essential to interpret wrist motion and optimise reconstructive strategies.

Aim: To document the anatomical features of a dual-pattern intertendinous crossover of the wrist extensors and to quantify its effect on wrist extension and radial deviation using a cadaveric traction model, thereby addressing functional balance in the wrist mechanism.

Material & Methods: A fresh-frozen upper limb specimen was dissected to identify and describe accessory slips between ECRL and ECRB, detailing origin, insertion and fibre course. The specimen was mounted in a custom external fixation frame and tested on a Mecmesin traction system. Linear tensile loads were applied sequentially to native ECRL, native ECRB and each accessory tendon slip. Wrist extension and radial deviation angles were recorded via an inertial sensor attached to the third metacarpal. Three conditions were compared: intact configuration, selective tenotomy of the accessory tendon, and selective tenotomy of the native tendon.

Results: Dissection revealed two distinct intertendinous slips: one from ECRL to ECRB and another from ECRB obliquely toward the ECRL sheath. Biomechanically, selective tenotomy of the accessory slip increased maximum wrist extension when ECRL was loaded (mean +8.2°) but reduced extension when ECRB was loaded (mean -6.5°). Correspondingly, radial deviation under the same loading shifted by +3.4° and -2.9°, respectively. Tenotomy of the native tendon produced a mirrored effect. These findings indicate that the accessory slips influence the dynamic balance between extensor compartments and radial deviation mechanics.

Conclusions: This is the first description of a dual-pattern intertendinous crossover between ECRL and ECRB and its measurable influence on wrist extension and radial deviation balance. The existence of such variants may alter wrist functional equilibrium and should be considered during tendon transfer planning, wrist surgery and postoperative motion assessment. Awareness and preoperative identification of these slip patterns may enhance surgical precision and functional outcomes in hand surgery.

A-0706 TIME AND PLACE OF RAY RESECTION IN MANGLED HAND RECONSTRUCTION

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Introduction: The term "mangled hand" encompasses severe injuries with damage to three or more key structures (skin, bone, joints, tendons, nerves, vessels). These injuries represent 12-18% of all upper extremity combat injuries in contemporary military conflicts. The decision to preserve or amputate a damaged hand ray is critical and defines the functional outcome. The timing of resection (primary versus delayed), the level of metacarpal resection, and integration within staged reconstruction protocols determine functional outcomes. However, optimal decision-making algorithms remain debated, particularly in high-energy trauma settings.

Aim: To compare treatment duration and hand function outcomes between ray resection versus attempted ray preservation in combat-related mangled hand injuries requiring staged reconstruction.

Material & Methods: We analyzed 21 military personnel with mangled hand injuries treated from February 2023 to October 2025. Group 1 (Early Resection, n=10) underwent ray resection based on non-viable tissue, complete metacarpal destruction, or failed initial reconstruction attempts. Group 2 (Attempted Preservation, n=11) underwent staged reconstruction including bone grafting, tendon repair, and soft tissue coverage. Outcome measures included DASH scores at 6 months, grip strength, treatment duration (days from injury to final reconstruction), return to military duties or adapted work, and complications requiring revision surgery.

Discussion: Early ray resection demonstrated significant advantages over attempted preservation in combat-related mangled hand injuries. The high-energy nature of combat trauma leads to massive contamination and tissue destruction. Early removal of the non-functional ray prevents the protracted course of infection and multiple revision surgeries associated with preservation attempts, leading to significant reduction in overall treatment duration and hospitalization. The benefit of early resection is not merely temporal. It allows the surgeon to proceed with forming a stable, prehensile unit (Narrow Hand Formation) with a robust base. The hand reconstructed after early resection, while having fewer rays, demonstrates superior grip strength and lower functional limitations compared to a hand where a non-stable, immobile, or painful ray was maintained. Given the extent of skeletal damage (complete metacarpal destruction) and the impossibility of adequate revascularization and reinnervation, early resection is a safer and more functionally justifiable approach than risking prolonged treatment with a non-functional outcome.

Conclusions: Early, function-oriented ray resection is an effective surgical approach in treating the mangled hand following combat trauma. This strategy reduces overall treatment time and achieves better long-term functional outcomes by providing the patient with a biological organ capable of performing key prehensile functions. This study represents the first attempt in our practice to compare these distinct surgical groups and establish the clinical efficacy of one method over the other in the context of combat-related injuries.

A-0707 ASSESSMENT AND ENHANCEMENT OF HAND SENSITIVITY IN SURGEONS PERFORMING SUPERMICROSURGERY: A CLINICAL EVALUATION STUDY

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Introduction: Supermicrosurgery requires a level of manual precision that exceeds the demands of conventional microsurgical procedures. As vessel calibers decrease to below 0.8 mm, surgeons must rely on exceptionally refined

tactile feedback, fine motor control, and stable hand positioning to perform accurate anastomoses. These procedures also impose prolonged periods of static posture and high visual-motor concentration, which may influence the surgeon's sensorimotor performance over time. Despite the increasing global adoption of supermicrosurgical techniques, there is limited evidence regarding how surgeons' hand sensitivity can be objectively evaluated or whether targeted training can enhance sensory acuity and fine motor responsiveness. Establishing measurable parameters for hand sensitivity and determining strategies to improve it may contribute to both procedural safety and surgical outcomes.

Aim: Supermicrosurgery requires submillimetric manipulation, making hand sensitivity, tremor control, and fine motor balance essential for surgical precision. The aim of this study was to objectively measure hand sensitivity in practising supermicrosurgeons and to evaluate the effect of a short, targeted training program on fine motor performance.

Material & Methods: Twenty-four surgeons with at least two years of supermicrosurgical experience were included. Baseline assessments consisted of the Nine-Hole Peg Test, Purdue Pegboard Test, tremor amplitude analysis, static two-point discrimination, pinch strength measurement, and proprioceptive position-matching tests. Participants then completed a 2-week intensive micro-motor training protocol (microsurgical tweezer drills, tremor reduction techniques, low-resistance manipulation exercises). All tests were repeated after training.

Results: Post-training evaluations demonstrated a significant improvement in fine motor speed (Nine-Hole Peg time reduced by an average of 12%, $p < 0.01$). Purdue Pegboard scores increased by 15% on average. Tremor amplitude decreased significantly ($p < 0.05$). Sensory discrimination showed mild, non-significant improvement. Proprioceptive accuracy improved by 9%. A moderate positive correlation was observed between years of supermicrosurgical experience and initial sensitivity scores ($r = 0.61$).

Conclusions: Hand sensitivity in supermicrosurgeons can be measurably enhanced through structured, short-term training. The most notable improvements occurred in tremor control and fine motor coordination. Incorporating such focused training protocols into standard supermicrosurgery education may contribute to improved surgical precision.

A-0708 DESCRIPTION OF A NOVEL SIX-STRAND FLEXOR TENDON TENORRHAPHY TECHNIQUE WITH PERITENDINOUS SUTURE: BIOMECHANICAL FINDINGS

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Introduction: Flexor tendon injuries of the hand represent a persistent challenge for hand surgeons due to the complex anatomy of the digital compartments, the limited space within the pulley system, and the need to restore not only tendon continuity but also smooth and functional gliding. The primary goal of flexor tendon repair is to achieve a repair strong enough to withstand the forces generated during early mobilization, while minimizing adhesion formation and preserving the pulley system. Over time, multiple tendon suture techniques have been described. The development of these techniques has been driven by the need to increase tensile strength and gap resistance at the repair site, without excessively increasing bulk. In this context, the description and biomechanical evaluation of new core suture configurations, combined with peritendinous suturing, are essential to optimize flexor tendon repair techniques. The introduction of six-strand techniques and variants using specific suture materials seeks to achieve an appropriate balance between initial strength, technical feasibility, and biomechanical behavior that permits early-motion rehabilitation protocols, thereby reducing the risk of joint stiffness and improving long-term functional outcomes.

Aim: This study aims to evaluate the tensile strength and biomechanical properties of a novel six-strand core suture

technique using looped nylon for the repair of flexor tendon injuries.

Material & Methods: This experimental study was conducted using 30 porcine deep flexor tendons, which were repaired with a new six-strand core suture technique employing 4-0 looped nylon and a peritendinous suture. All repaired tendons were tested using dynamometric tensile loading to determine the maximum failure load, measured in Newtons.

Results: Thirty tendons were subjected to tensile testing to determine the strength of the tendon repair. The mean failure load was 85.6 N (standard deviation 15.4 N), with a minimum value of 53.7 N and a maximum of 104.0 N. The median failure load was 87.5 N, and the mode was 98.3 N. The interquartile range extended from 71.9 N (25th percentile) to 99.4 N (75th percentile), indicating that most measurements clustered at relatively high strength levels. The coefficient of variation was 18%, reflecting moderate variability among samples. Distribution analysis demonstrated a slight negative skew with no extreme outliers.

Conclusions: The six-strand suture technique evaluated in this study demonstrated a mean tensile strength of 85.6 N, with moderate variability and absence of extreme outliers, suggesting a biomechanically stable and reproducible behavior across the 30 tendons analyzed. The combination of adequate initial strength, the characteristic feature of this technique in which most of the suture material remains within the tendon substance, and the statistically homogeneous dispersion of the data indicates that this six-strand repair may provide a sufficient safety margin for the implementation of early mobilization protocols aimed at reducing joint stiffness. From a practical standpoint, this configuration appears to be technically reproducible.

A-0709 RECONSTRUCTION OF FINGERTIP DEFECTS USING THE REVERSE-FLOW HOMODIGITAL ISLAND FLAP

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Introduction: The hand plays a crucial role in fine motor skills, sensory feedback, and daily functional tasks. The fingertip and digital pulp are essential for tactile discrimination, overall hand balance, and precise manipulation. Soft tissue defects in this region—particularly those with exposed distal phalanx—represent a significant reconstructive challenge. Despite various surgical options described in the literature, obtaining a method that offers reliable vascularity, durable coverage, preserved function, and satisfactory aesthetics remains the primary objective. The reverse-flow homodigital island flap has increasingly been favored because it provides well-vascularized, pliable tissue similar to native pulp while avoiding morbidity of regional flaps. This study presents our experience with the reverse homodigital island flap for fingertip and pulp defects, focusing on indications, technique, and clinical outcomes.

Material and method: This retrospective review included patients who underwent reconstruction of fingertip or pulp defects with the reverse-flow homodigital island flap between April 2023 and October 2024. All cases involved distal phalanx exposure due to traumatic injury. The flap was designed along the dorsolateral aspect of the proximal phalanx, preserving the distal anastomotic arch of the digital arteries. During elevation, the digital artery was ligated proximally to allow retrograde perfusion through the distal arcade, while the digital nerve was carefully separated and preserved. The flap was transferred to the defect through a subcutaneous tunnel and inset without tension. Donor sites were closed primarily when possible or reconstructed with full-thickness skin grafts. Demographic data, mechanism of injury, flap size, donor-site management, postoperative complications, and long-term functional recovery were recorded. Clinical follow-up assessed range of motion, two-point discrimination, cold intolerance, and patient satisfaction.

Discussion: Reconstruction of fingertip defects requires a technique that restores durability, contour, and sensibility. The reverse-flow homodigital island flap meets these criteria by providing glabrous, well-vascularized tissue with minimal

donor-site morbidity. Its greatest advantage is the preservation of finger length and early mobilization since it does not require immobilization of adjacent digits, unlike cross-finger flaps. Sensory recovery tends to be favorable due to proximity to native digital nerve branches and cortical adaptation. Complications such as venous congestion can occur but typically resolve with conservative measures. Compared with regional or free flaps, this method offers a single-stage solution, reduced operative time, and reliable perfusion from the distal arterial arch. Our clinical outcomes align with existing literature, supporting the reliability and functional advantages of this flap in appropriately selected fingertip defects. Conclusion: The reverse-flow homodigital island flap provides an effective and dependable option for reconstructing fingertip and digital pulp defects with bone exposure. It offers durable coverage, satisfactory sensibility, preserved joint mobility, and minimal morbidity. Based on our experience, it stands as a strong reconstructive choice and should be considered a primary option in the management of suitable fingertip injuries.

A-0710 CARPAL TUNNEL SYNDROME AND AMYLOIDOSIS: GENDER ASSOCIATED DIFFERENCES

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Carpal tunnel syndrome can be an early sign of systemic amyloidosis. Caused by the deposition and accumulation of misfolded proteins called amyloid, carpal tunnel syndrome in patients with unidentified amyloidosis can often help to obtain the right diagnosis years before systemic symptoms especially in the heart occur. However, recent studies suggest that gender associated differences play a crucial role when it comes to the most common type of wild-type transthyretin amyloidosis (wtATTR).

Consequently, we want to highlight sex differences with clinical presentation, diagnostic challenges, disease progression and treatment outcomes reviewing the current literature.

Based on the available evidence, cardiomyopathy caused by wt-transthyretin amyloidosis predominantly affects men whereas women are older at presentation. A milder or more atypical disease progression in females could result in a longer delay in the diagnosis of wtATTR. The mean survival rate after diagnosis of wt-ATTR untreated is approximately 4 years, which makes it even more important to recognize the disease and implement treatment before heart failure occurs. Patients diagnosed by autopsy were significantly more likely to be female. Similar guidelines like left ventricular wall thickness for the identification of cardiac amyloidosis for both sexes but larger cardiac anatomy in males compared to females may lead to an underdiagnosis in females. Therefore it is important to raise awareness of associated features in systemic amyloidosis like carpal tunnel syndrome. Females are for example more likely to present with bilateral carpal tunnel syndrome in amyloidosis.

We as hand surgeons can contribute to increasing early diagnosis of wt-ATTR for both women and men by implementing a standard algorithm for biopsy in carpal tunnel release surgery within our daily practice.

A-0711 FUNCTIONAL RECONSTRUCTION OF A COMPLEX ANTECUBITAL SOFT-TISSUE DEFECT: AN INTEGRATED MICROSURGICAL AND NERVE REPAIR APPROACH

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Introduction: Extremity trauma involving skin lacerations and soft-tissue loss is frequently associated with concomitant vascular and nerve injuries, creating challenges in both limb salvage and functional recovery. Injuries around the antecubital

region are particularly demanding due to the density of neurovascular structures and the need for stable, thin, and durable soft-tissue coverage. In this report, we present the management of a 23-year-old male patient who developed an infected soft-tissue defect of the right antecubital fossa following a glass-punching injury that resulted in brachial artery transection and radial nerve damage. We describe the reconstructive strategy combining free tissue transfer, nerve grafting, and tendon transfer, and we discuss the rationale behind each component of the surgical plan.

Aim: The aim of this case report is to demonstrate an integrated microsurgical and functional reconstruction approach for complex antecubital soft-tissue defects accompanied by arterial and nerve injury. Emphasis is placed on achieving reliable coverage, restoring vascular integrity, and supporting early functional recovery through combined nerve and tendon reconstruction.

Material & Methods: The patient initially underwent repair of a right brachial artery transection at an external cardiovascular surgery center. Due to tension at the anastomosis site, a revision procedure using a saphenous vein graft was performed. He was subsequently referred to our clinic with wound infection and soft-tissue loss. Examination revealed a wrist drop suggestive of radial nerve injury. After admission, serial debridements were performed to optimize the wound bed.

For coverage of the approximately 6×4 cm antecubital defect, a free superficial circumflex iliac artery perforator (SCIP) flap was planned from the left inguinal region. During exploration, a partial radial nerve injury proximal to the posterior interosseous nerve branch point was identified. Because the nerve ends could not be approximated without tension, a 5-cm sural nerve graft was harvested through blunt dissection posterior to the left lateral malleolus and used to bridge the defect. To maintain wrist extension during the expected regeneration period, a pronator teres to extensor carpi radialis brevis (PT→ECRB) tendon transfer—also known as an internal splint—was performed. The SCIP flap was then elevated, transferred to the recipient site, and anastomosed end-to-side to the brachial artery with venous outflow established via concomitant veins. Adequate perfusion was confirmed intraoperatively.

Results: The SCIP flap offers thin, pliable coverage suitable for regions requiring flexibility, such as the antecubital fossa. Its reliable anatomy and minimal donor-site morbidity make it a strong option for upper-extremity reconstruction. The sural nerve, being purely sensory, is an excellent donor for nerve grafting with acceptable morbidity. Combining nerve grafting with early PT→ECRB tendon transfer provides both structural repair and functional support during the prolonged regeneration period typical of radial nerve injuries. In this case, the integrated approach resulted in a viable flap, stable wrist posture, and early signs of neurological recovery by the second postoperative month.

Conclusions: This case highlights the importance of timely, multidisciplinary reconstruction to restore both form and function in complex upper-extremity injuries.

A-0712 IMPROVING HAND FUNCTION THROUGH BALANCE RESTORATION: RETROSPECTIVE OUTCOMES IN SWAN-NECK DEFORMITY

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Introduction: Swan-neck deformity (SND), defined by PIP hyperextension and DIP flexion, represents a complex imbalance of the finger's extensor and volar stabilizing structures. Its mechanisms have been extensively described, particularly regarding extensor mechanism dysfunction, volar plate attenuation, and less frequently rheumatoid arthritis. This study aimed to retrospectively evaluate clinical and functional outcomes of patients treated for SND and compare findings with established treatment principles.

Aim: This study aimed to retrospectively evaluate clinical and functional outcomes of patients treated for SND and compare findings with established treatment principles.

Material & Methods: Seventeen patients treated for SND between January 2023 and September 2025 were retrospectively reviewed. Etiological distribution was dominated by dorsal/extensor mechanism imbalance in 10 patients (59%), followed by traumatic volar plate attenuation in 4 patients (24%), and rheumatoid arthritis in 3 patients (17%). Deformities were classified as mild, moderate, or severe. Treatment modalities included splinting, FDS tenodesis, lateral band volar transfer, and soft-tissue balancing procedures following recognized surgical algorithms. Outcomes were assessed using QuickDASH scores, PIP stability, pain levels, and patient satisfaction. Mean follow-up was 14 months (12–20 months). Rehabilitation protocols adhered to established postoperative guidelines.

Results: Nine patients (53%) were managed conservatively and eight (47%) surgically. Splinting achieved meaningful improvement in mild deformities, providing functional stability in 78% of cases, consistent with prior descriptions of flexible SND. Moderate and severe deformities—most commonly associated with extensor mechanism imbalance—were treated with FDS tenodesis or lateral band volar transfer, yielding an average correction of 27° in PIP hyperextension, in line with classical tendon-rebalancing principles. Surgical outcomes showed full or near-full stability in 75% and functional stability in 25% of patients. QuickDASH scores improved significantly from baseline ($p < 0.05$). No major complications were observed; two patients developed temporary postoperative stiffness that resolved with rehabilitation.

Conclusions: This retrospective analysis demonstrates that restoring biomechanical balance in SND leads to substantial functional improvement. Conservative management remains effective for mild deformities, while FDS tenodesis and lateral band volarization provide stable PIP alignment in more advanced cases. Adherence to established pathomechanical concepts and structured rehabilitation is critical for optimized outcomes.

A-0713 IMPROVED SENSORY RECOVERY REDUCES COLD SENSITIVITY AND HYPERESTHESIA/ALLODYNIA AFTER MEDIAN AND ULNAR NERVE INJURIES

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Introduction: Despite surgery, adults with median or ulnar nerve injuries experience impaired sensibility, cold sensitivity and pain. Several mechanisms for development of cold sensitivity and allodynia are suggested, spanning from incomplete-abnormal axonal regeneration to dysregulation of the sympathetic system, as well as to central sensitization-maladaptive alterations.

Aim: We hypothesize that perception of touch (i.e., Semmes-Weinstein monofilaments; SWM) and/or a central interpretation of sensation (i.e., two-point discrimination; 2-PD) predict cold sensitivity and hyperesthesia/allodynia following repair or reconstruction of median and ulnar nerve injuries.

Material & Methods: In a retrospective cross-sectional study, 103 patients (age ≥ 18 years), who had undergone surgical nerve repair or autologous nerve grafting of the median or ulnar nerves at wrist or forearm levels 2008 - 2024 at two Swedish hand surgery departments, were functionally assessed using the Rosen score at 6, 12 and 24 months postoperatively. Sensory recovery was measured by SWM [graded from “not measurable” to 2.83 (normal)] and static

2-PD [from ≥ 16 mm to normal ≤ 5 mm], while cold sensitivity and hyperesthesia/allodynia were evaluated as patient reported outcomes on four-degree scales [hinders function (0 points), disturbing (0.33 points), moderate (0.67 points), none (1 point)]. Associations between sensory recovery (SWM and 2-PD being predictors of interest) and cold sensitivity or hyperesthesia/allodynia were analysed using three linear mixed-effects models [Model 1 - all nerve injuries; Model 2 - median nerve injuries; Model 3 - ulnar nerve injuries; significant regression coefficients (β) presented] adjusted for covariates (potential confounding factors: sex, age, injured nerve, level of injury) (reference category Models 1 and 2: median nerve injury at wrist level at 6 months; Model 3: ulnar nerve at injury at 6 months).

Results: Recovery of sensory function, assessed by SWM and 2-PD, was only partly, but significantly, associated with a lower cold sensitivity across all nerve injuries ($\beta = 0.30$ and $\beta = 0.35$, respectively) with a most prominent effect in ulnar nerve injuries ($\beta = 0.39$ and $\beta = 0.38$, respectively); i.e., predicting that in two patients with SWM = 0 and SWM = 1, the second's cold sensitivity score is 0.30 units higher than the first with covariates constant (e.g., a difference between disturbing and moderate cold sensitivity). Woman experienced more cold sensitivity after ulnar nerve injuries ($\beta = -0.30$ and $\beta = -0.25$, respectively). The effect of sensory recovery did not change significantly over time or vary by the injury location. Likewise, similar recovery of sensory function was significantly associated with less hyperesthesia/allodynia across all nerve injuries (SWM $\beta = 0.39$ and 2-PD $\beta = 0.36$, respectively) and with associations in median (SWM $\beta = 0.40$) and ulnar nerve (SWM $\beta = 0.39$) injuries (no association with 2-PD). Female sex was associated with more hyperesthesia/allodynia across all nerve injuries (SWM $\beta = -0.16$).

Conclusions: Improved sensory recovery following surgery for median and ulnar nerve injuries is only partly associated with decreased cold sensitivity and hyperesthesia/allodynia, with this relationship being most evident in ulnar nerve injuries. Women remain at greater risk for symptoms.

A-0715 THE CLINICAL VALUE OF SYMPTOM ONSET TIME AND DISCOMFORT LEVEL DURING THE ROOS TEST IN THORACIC OUTLET SYNDROME OBJECTIVE

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Introduction: Thoracic outlet syndrome (TOS) often leads to pain and functional limitations, and the Roos test is widely used as a provocative maneuver in its evaluation. Although primarily diagnostic, the test's quantitative responses, such as symptom onset time and discomfort level, may reflect the clinical severity of TOS. However, the significance of these measurable parameters remains unclear.

Aim: To examine whether symptom onset time and discomfort level during the Roos test are associated with pain severity and functional disability in patients with TOS.

Material & Methods: A total of 86 patients with clinically confirmed TOS underwent the Roos test. During the test, the time to symptom onset (seconds) and the discomfort level at test completion (0–10 numeric rating) were recorded. Pain severity was assessed using VAS-rest, VAS-activity, and VAS-night scores, and functional disability was evaluated using the Pain Disability Index (PDI). Spearman correlation analysis was used to evaluate associations between Roos test parameters and clinical outcomes. Patients were then stratified into early and late symptom onset groups based on the median onset time, and the groups were compared using the Mann–Whitney U test.

Results: The mean symptom onset time during the Roos test was 19.45 ± 10.32 seconds, and the mean discomfort level at the end of the test was 6.65 ± 2.40 . Also, there was a significant association between the symptom onset time during the

Roos test ($r = -0.284$, $p = 0.008$) and the discomfort level at the end of the test ($r = -0.323$, $p = 0.002$) with PDI scores. A significant correlation was also found between discomfort level and VAS-activity ($r = 0.296$, $p = 0.006$). No statistically significant relationships were found among the other parameters.

The median symptom onset time was 17 seconds. Median-based grouping showed that patients with early symptom onset (<17 s) had significantly higher PDI scores ($p = 0.001$) and higher VAS-activity levels ($p = 0.041$) compared with those in the late-onset group (≥ 17 s).

Conclusions: Quantitative responses during the Roos test, specifically early symptom provocation and higher discomfort, are associated with increased pain severity and functional disability in TOS. These findings suggest that beyond its diagnostic utility, the Roos test may serve as a valuable prognostic indicator for identifying patients with higher functional burden and may help guide clinical decision-making in the assessment and management of TOS.

A-0716 CLINICAL AND RADIOGRAPHIC OUTCOMES OF 9 TOTAL TRAPEZIOMETACARPAL JOINT PROSTHESES IN COMPLEX CASES OF OSTEOARTHRITIS WITH TRAPEZIUM DYSPLASIA ASSOCIATED WITH COMPLETE TM JOINT DISLOCATION

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Introduction: In Europe, Trapeziometacarpal (TM) joint arthroplasty has become one of the leading treatment options for TM joint osteoarthritis (OA). We distinguish between simple and complex cases of OA. Complex cases include poor bone quality, Z-shaped thumb deformity, small sized trapezium, peri-trapezial osteoarthritis, exuberant osteophytes and trapezium dysplasia associated with instability that can lead to chronic TMC joint dislocation. This last deformity is frequently associated with severe trapezium wear and critical bone loss. Therefore, TMC joint prosthesis implanted are at high risk of instability and early cup loosening.

Aim: The aim of this study was to assess the clinical and radiographic outcomes of 9 total TM joint arthroplasties (5 single mobility and 4 dual mobility implants) in patients with TM joint OA associated with trapezium dysplasia and complete TMC joint dislocation at a minimum of 1 years of follow up.

Material & Methods: Clinical assessment included pain, mobility, Kapandji opposition score, strength (grip and pinch) and QuickDASH functional score. Radiographic analysis using Kapandji incidences looked for signs of sinking or loosening of trapezial and metacarpal implants, and polyethylene wear.

Results: Mean follow-up was 49 months postoperatively (min=16, max= 79). The average age of patients at the time of surgery was 56 (min = 53, max = 64). Mean postop VAS was 1,4 (1,9). The mean Quick Dash score was 13,3/100 (9,1). Postoperative mobility was comparable to preoperative mobility. We observed a meaningful increase in palmo-digital and pollici-digital strength, with 19.4 kg (7) and 5.8 kg (2.6) respectively.

Radiographically, we identified no case of polyethylene wear, peri-trapezial osteolysis or implant subsidence.

We report 1 cases of surgical revision for implant failure secondary to traumatic fracture of the trapezium and cup loosening treated by trapeziectomy.

Conclusions: Total TM joint arthroplasty provides a reliable midterm solution in complex cases of trapezium dysplasia with complete TMC joint dislocation. No additional procedure is required at time of primary surgery. Instability and bone loss management are critical factors to consider when positioning the implant.

A-0717 COMBINED DORSAL ORIF AND PERCUTANEOUS TECHNIQUE FOR TRANSSCAPHOID PERILUNATE INJURY

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Introduction: A transscaphoid perilunate dislocation is a complex wrist injury characterized by a fracture through the scaphoid bone combined with a perilunate dislocation, in which the carpus dislocates dorsally relative to the lunate while the lunate remains aligned with the distal radius. This pattern typically results from high-energy trauma, such as a fall on an outstretched hand with the wrist in hyperextension, ulnar deviation, and supination.

This injury pattern disrupts both bony and ligamentous structures, as the scaphoid fracture permits dorsal displacement of the distal carpal row and frequently involves scapholunate and/or lunotriquetral ligament injuries. Prompt diagnosis and anatomic reduction are essential to prevent carpal instability, posttraumatic arthritis, and median nerve dysfunction. The Berger and Bishop radially based dorsal approach offers excellent exposure of the proximal carpal row, allowing stable fixation of the scaphoid and direct repair of associated ligamentous injuries.

Aim: To describe the surgical management and outcome of a transscaphoid perilunate dislocation with associated radial styloid fracture and lunotriquetral bony avulsion using a combined percutaneous and dorsal open technique.

Material & Methods: A 25-year-old male sustained a fall from a bicycle onto an outstretched right hand. He presented with severe wrist pain, limited motion, and mild paresthesia in the second, third, and radial half of the fourth finger.

Radiographs revealed a transscaphoid perilunate dislocation with fractures of the scaphoid waist and radial styloid (Mayfield stage II). Urgent closed reduction by the Tavernier maneuver restored carpal alignment and relieved median nerve symptoms. Post-reduction images confirmed correct lunate position and restoration of Gilula's arcs.

CT showed a scaphoid waist fracture, radial styloid fracture, and dorsal triquetral avulsion (triquetral part of lunotriquetral ligament). As the patient was neurologically intact, surgery was performed the following day under brachial plexus block. Under fluoroscopic control, the radial styloid fracture was fixed percutaneously with a headless compression screw. The scaphoid fracture was approached dorsally through the Berger incision, anatomically reduced, and stabilized with a Herbert screw inserted in an antegrade fashion. The dorsal, triquetral portion of the lunotriquetral ligament was repaired, and temporary K-wires were inserted from triquetrum to lunate and triquetrum to hamate for carpal stabilization.

Results: Postoperative radiographs confirmed anatomic reduction and stable fixation. At two and six weeks, follow-up imaging showed maintained alignment and proper implant position.

CT at eight weeks demonstrated satisfactory bone healing, enabling gradual wrist mobilization. K-wires were removed at 12 weeks, followed by structured physiotherapy.

At six months, the patient reported VAS 3, DASH 29.2, QuickDASH 31.8, PRWE 30, and Mayo Wrist Score 70%. Wrist extension was 58°, flexion 49°, and grip strength 77% of the contralateral hand. He returned to full daily activities without pain or instability.

Conclusions: Early diagnosis and combined surgical management using percutaneous fixation of associated fractures and dorsal ORIF with ligament repair allow for anatomical reconstruction and excellent functional recovery in transscaphoid perilunate dislocations. The dorsal Berger approach provides optimal exposure and stability for both fracture fixation and soft-tissue repair.

A-0718 TUMORS OF THE HAND- CLINICAL EXPERIENCE, RETROSPECTIVE REVIEW

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Introduction: Tumors of the hand can affect in both soft tissue and bone. They can arise from any tissue. Due to important function of the hand as well as anatomical aspect, all neoplasm within the hand should be treated with special attention. Most of the tumors are benign, but malignant tumors also occur. Proper preoperative diagnostic procedures and appropriate surgical techniques with oncological principles usually caused good results.

Aim: The aim of the study was to evaluate the outcomes of surgical treatment in patients with tumors of the hand, especially in functional aspect, infectious problems, tumor recurrence.

Material & Methods: Between 2003 and 2023, 196 patients were hospitalized in our Department, due to neoplasm of the hand. Soft-tissue tumor accounted for 71%, while 39% involved bone. The majority were benign tumors (98%). The most common bone lesions was enchondroma, and among soft-tissue tumors the most frequent were giant cell tumor of the tendon sheath (34%) and simple ganglion cyst (33%). The clinical management algorithm was identical for all patients—following diagnostic procedures, surgical treatment was performed with oncologic principles. All the patients operated on due to hand tumors were analyzed, taking into account especially: kind of tumor, postoperative hand function, neurovascular injury, infectious problem and recurrence.

Results: In 195 patients, a good functional outcome was achieved. Two patients who underwent lipoma resection required soft-tissue reconstruction due to the extent of the lesion and involvement of the commissure. Complications occurred in 3 patients: two cases of local recurrence of giant cell tumor of the tendon sheath, required reoperation, and one case of fracture of the proximal phalanx following surgical treatment of enchondroma. Despite reoperation and rehabilitation, this patient has deformity of the operated finger and reduced range of motion compared with the preoperative condition. In one case, both the preoperative and postoperative histopathological examinations required verification, it caused confusion of proper way of treatment, prolonging the overall treatment time and postoperative care. We have not noticed serious neurovascular structures injury, and infectious complications were not observed.

Conclusions: In cases of hand tumors, even though they are usually benign, a malignant process must always be excluded. Oncologic aseptic principles should be followed in every case. For extensive tumors, soft-tissue reconstruction is sometimes necessary.

The outcomes of surgical treatment of benign hand tumors are generally good, with a low risk of complications, if the adequate preoperative diagnostics and proper surgical technique were used.

A-0720 TRAPEZIUM PRESERVATION IN REVISION SURGERY FOR COMPLICATION AND FAILURE OF TRAPEZIOMETACARPAL JOINT ARTHROPLASTY. CLINICAL AND RADIOLOGICAL OUTCOME OF 23 CASES

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Introduction: Complications of primary TM joint prosthesis implantation are mainly trapezium loosening and instability. Early trapezium loosening is the result of failure of osteointegration in young patients with high demanding activity or older patients with osteoporotic bone. Late cup dislocation or loosening are secondary to polyethylene wear, responsible for

instability or secondary cup loosening (foreign body giant cell reaction causing bone resorption). Secondary trapeziectomy is the gold standard.

Aim: The aim of the study was to evaluate the clinical and radiographic outcomes of alternative surgical options preserving the trapezium.

Material & Methods: The mean age of patients at the time of revision surgery was 66 years.

Trapezium implant failure was treated according to the residual bone stock.

- With no bone loss : trapezium cup replacement was performed with the same or a greater-diameter trapezium implant (n=13).

- With trapezium loosening and limited central bone loss, cancellous bone graft and press fit cup replacement of same or greater-diameter was indicated in patients (n=7).

- With severe central bone loss (excavated trapezium), a cortico-cancellous bone graft was harvested on the ipsilateral iliac crest and impacted in press fit in the residual trapezium before cup implantation (n=3).

Results: Mean follow-up was 6.2 years post-op.

The VAS was evaluated at 1.4/10 (1,7). The mean opposition score was 8,6 (7,3). The mean Quick Dash score was 21.7/100 (17,6). Pinch strength was measured at 64% on the contralateral side when healthy. 4 cases of secondary revision surgery were reported, 3 for trapezium loosening, 1 for instability. Radiographically, 39% of revision implants had stable radiolucencies.

Conclusions: Although uncommon, complications of primary TM joint prosthesis implantation are mainly trapezium failure. Secondary trapeziectomy is the gold standard. The choice of alternative surgical options can be based on residual trapezium bone stock. These surgical options showed good clinical results, but the rate of secondary revision was high in our series. Because revision surgery is becoming more frequent owing to the growing number of primary TM joint prosthesis, longitudinal follow-up of implants is essential to detect early mechanical failure and consider revision before complete trapezium destruction.

A-0721 OUR APPROACHES IN THE PREOPERATIVE ASSESSMENT FOR SURGICAL TREATMENT OF ELBOW SPASTICITY

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Introduction: Imbalance between spastic elbow flexors and weak extensors leads to impaired upper limb function and cosmetic deformity. Spasticity results from complex mechanisms including velocity-dependent muscle hyperactivity, spastic dystonia, co-contraction, and synkinesis. Clinical examination alone cannot reliably distinguish spasticity from fixed contracture, so additional diagnostic procedures are needed. Accurate identification of the muscles responsible for abnormal posture is essential for selecting candidates for surgery and for planning the extent of selective neurotomy or tendon lengthening. The goal of preoperative assessment is to choose the optimal surgical solution and to estimate postoperative outcomes using temporary, reversible tests.

Aim: The aim was to describe and evaluate a structured multidisciplinary protocol for the preoperative assessment of patients with elbow spasticity. The approach combines clinical examination, botulinum toxin testing, ultrasound-guided selective nerve blocks, and dynamic electromyography (EMG). Its objective is to improve target muscle identification, differentiate true spasticity from contracture, and optimize decision-making for upper limb reconstructive surgery.

Material & Methods: Patients with upper limb spasticity were evaluated using a standardized protocol. Each underwent clinical examination, including the Tardieu Scale, Goal Attainment Scale, active and passive range-of-motion testing,

and functional video analysis. Selective botulinum toxin injections were applied to suspected spastic flexors to provide temporary relaxation and simulate potential postoperative improvement in elbow and hand function.

Ultrasound-guided blocks were used to verify involvement of the brachialis, biceps brachii, and brachioradialis. The musculocutaneous nerve was blocked under ultrasound guidance with 5 ml of 0.375% bupivacaine, and changes in function were observed over 30 minutes.

Needle dynamic EMG was performed during active and passive movements to evaluate the degree of spasticity in individual muscles, co-contraction, synkinesis, and antagonist activation. Findings from all assessments were integrated to guide surgical planning, most often hyperselective neurectomy of the relevant nerve branches.

Results: The combined preoperative protocol provided consistent results and improved diagnostic accuracy. Clinical examination alone was insufficient to identify the main contributors to abnormal flexor posture. The addition of botulinum toxin testing, nerve blocks, and dynamic EMG significantly enhanced localization of dominant spastic muscles and assessment of antagonist function.

Conclusions: A structured preoperative protocol integrating clinical evaluation, dynamic EMG, selective nerve blocks, and individualized botulinum toxin testing is a reliable method for assessing elbow spasticity. It enables differentiation between spasticity and contracture, objective evaluation of antagonist capacity, and realistic simulation of expected surgical outcomes. This approach increases the precision of indications for selective hyperneurectomy and tendon procedures. Needle dynamic EMG appears particularly valuable for determining the degree of spasticity in individual muscles and understanding their dynamic relationships. Effective management of upper limb spasticity requires close cooperation among surgeons, physical therapists, anesthesiologists, and electrophysiologists to achieve optimal functional and aesthetic results.

A-0722 MICROSURGICAL UPPER EXTREMITY RECONSTRUCTION IN THE UKRAINE–RUSSIAN WAR: LESSONS LEARNED FROM MODERN WAR MEDICINE

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Since 2023, our reconstructive surgical team under MEDEVAC Czech has been 9-times deployed to Ukraine to support and collaborate with local surgeons in managing devastating upper extremity injuries caused by the ongoing war. The experience has revealed both the unique challenges and remarkable adaptability of modern microsurgery in a combat environment. Most patients presented with complex blast or ballistic trauma, often involving extensive soft-tissue loss, multiple fractures, and delayed or staged wound management. Despite the limited resources, unstable logistics, and variable timing of evacuation, successful limb salvage was high in the majority of cases through the use of free flaps, pedicled regional transfers, and staged reconstructive strategies. Key factors contributing to success included meticulous debridement, simplified flap monitoring protocols, hybrid fixation techniques, and close collaboration between local and international surgical teams. Beyond the technical aspects, this experience underscored the importance of flexibility, education, and mutual trust in developing sustainable reconstructive capacity under war conditions. The lessons learned from these missions not only contribute to the advancement of war-related microsurgery but also carry significant implications for disaster and mass-casualty response in civilian settings. This presentation aims to present our experience in managing these injuries, addressing specific clinical circumstances and sharing insights from our practice.

A-0723 DISPARITIES IN THE UTILIZATION OF WIDE-AWAKE LOCAL ANESTHETIC HAND SURGERY

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Introduction: Wide-Awake Local Anesthesia No Tourniquet (WALANT) has become an increasingly utilized technique in hand surgery due to enhanced recovery time, improved patient satisfaction, improved outcomes for some procedures, and cost-effectiveness. During surgery, WALANT patients are awake and communicate with the surgical team to evaluate the efficacy of surgery (e.g., tendon repair, trigger finger release). Given that WALANT involves patient participation, language barriers may limit its accessibility and adoption in patients with non-English language preference (NELP). NELP patients face healthcare disparities throughout the surgical care process, ranging from accessibility to post-operative care. As such, we seek to evaluate the utilization of WALANT hand surgery among patients with NELP and English-language preference (ELP).

Aim: To assess the association of language preference with WALANT utilization among patients seen at University of California (UC) hospitals.

Material & Methods: Retrospective data were obtained from the structured electronic health records (EHR) from the University of California (UC) Health Datawarehouse. Adults undergoing surgery for isolated carpal tunnel syndrome, trigger finger release, and de Quervain's tenosynovitis at any UC academic medical center from 2019 – 2024 were identified. The proportion of ELP, Spanish language preferring (SLP), and other non-English language preferring (ONELP) patients undergoing WALANT versus other types of anesthesia for each procedure was evaluated. Multivariable logistic regression was used to evaluate the association between language preference and WALANT utilization. The additional variables for analysis included age, sex, race, ethnicity, Charlson Comorbidity Index (CCI), insurance, and area deprivation index (ADI).

Results: A total of 20,029 patients were identified. 13,526 remained after exclusion criteria were applied. Of those that remained, 10,137 patients received WALANT hand surgery. In multivariable logistic regression, older age (≥ 75 years: OR = 0.56, $p = 0.02$), higher comorbidity burden (CCI 1–3+: OR = 0.42–0.30, all $p < 0.001$), and greater neighborhood deprivation (ADI 4th–5th quintiles: OR = 0.35–0.41, both $p < 0.001$) were independently associated with lower odds of undergoing a wide-awake procedure. Male sex (OR = 2.35, $p < 0.001$), Hispanic ethnicity (OR = 2.35, $p < 0.001$), and Spanish language (OR = 3.14, $p < 0.001$) were associated with higher odds. Patients with public insurance (e.g., Medicaid: OR = 0.74, $p = 0.09$) were less likely to undergo wide-awake surgery compared with those with private insurance. Compared with carpal tunnel release, both De Quervain's release (OR = 0.51, $p < 0.001$) and trigger-finger release (OR = 0.71, $p < 0.001$) were less frequently performed under wide-awake conditions.

Conclusions: SLP patients were more likely to undergo WALANT than ELP patients. Differences in utilization by age, sex, ethnicity, area deprivation, comorbidity, and insurance suggest that regional or site-level practice patterns may influence these trends. Understanding the perspectives of the individuals involved (i.e. patients' and surgeons' perspectives) and utilization of language resources at the provider and institutional level are needed to better understand the factors driving WALANT adoption.

A-0724 BALANCING SKIN REPLACEMENT WITH A FISH SKIN SUBSTITUTE IN EPIDERMOLYSIS BULLOSA PATIENTS

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Introduction: Epidermolysis bullosa (EB) represents a group of rare inherited mechanobullous skin disorders, with the recessive dystrophic form (RDEB) resulting from deficiency or absence of type VII collagen, a key component of the dermo-epidermal junction. The resulting fragility leads to chronic blistering, scarring, pseudosyndactyly and the formation of “cocoon hands”, in which one’s digits are completely fused. Mucosal involvement and an increased risk of cutaneous squamous cell carcinoma (SCC) further contribute to morbidity. Management focuses on improving quality of life through multidisciplinary care.

Aim: This study presents our surgical approach to hand and foot skin replacement in patients with RDEB and one case of junctional EB (JEB), emphasizing outcomes of various wound coverage techniques.

Material & Methods: Between 01/2005 and 11/2025, 7 of 26 patients with EB underwent surgery at the Clinic of Hand Surgery, in collaboration with the Clinics of Dermatology and Hand Therapy of our institution. Six patients had RDEB and one JEB, of which four were female. Ten surgeries were performed on two adult patients. The median age at first operation was 12.3 years (range 3.5–48.1 years). The JEB patient underwent commissural release of the feet, whereas the remaining six underwent surgery on their hands. Procedures included commissural opening with defect coverage using local flaps, application of biological substitutes or secondary intention healing. Postoperative dressing consisted of sodium hyaluronate cream, silicone layer, foam dressing and custom-made neoprene splint with interdigital straps. Dressings were changed weekly, initially under general anesthesia. Occupational therapy performed regular splint adjustments and functional training.

Results: Of 7 patients 31 procedures were performed with mixed techniques of skin coverage allowing intra-patient comparison. Two defects were left to heal by secondary intention, in four cases local flaps were performed, in 9 cases living cellular skin substitute Apligraf® was applied and in 13 (since June 2022) Kerecis Omega-3®, a non-cellular, biologically active material derived from fish skin was used. Patients treated with Kerecis Omega-3® demonstrated accelerated wound healing (within two weeks) and had no postoperative complications, in contrast to one reported infection in the Apligraf® group. The children were able to perform daily activities at latest 4 weeks after surgery. Revision surgery was required in pediatric patients due to growth and the nature of the disease, with the earliest occurring 20 months postoperatively in the Kerecis group. One patient developed aggressive SCC requiring hand amputation despite multiple excisions.

Conclusions: Treatment of RDEB and JEB remains complex and requires multidisciplinary approach with careful patient selection prior to surgery due to cumbersome postoperative care. With Kerecis® covering the defects after web space opening, wound healing was satisfactory including the achieved functional results. To help restore the skin’s balance, multiple teams of specialists, therapists and family are involved. The Kerecis® method is observed to help increase hand functionality and an improved quality of life. We believe that long term review of the functional results, as well as the timing and degree of recurrence would be worth evaluating further.

A-0725 INTERPROFESSIONAL OUTPATIENT CLINIC WITH ADVANCED PRACTICE ROLES IN HAND THERAPY

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Introduction: Demographic changes and an increasing shortage of general practitioners pose significant challenges to the outpatient management of hand surgery patients in Switzerland. The high dependence on foreign-trained physicians (41% of all doctors) further highlights the need for new care models. Delegated task shifting through Advanced Practice (AP) roles in physiotherapy and hand therapy represents a potential solution, allowing selected clinical tasks traditionally performed by hand surgeons to be safely transferred to trained therapists.

Methods: The University Hospital Zurich introduced one the first AP role in hand therapy nationwide. A comprehensive concept was developed, including a defined scope of practice and diagnosis-specific treatment pathways. An AP therapist conducts a weekly interprofessional hand clinic, performing clinical assessments and discussing findings with patients. Treatment decisions are subsequently made jointly with senior hand surgeons in direct interaction with the patients. The new model runs parallel to the regular hand surgery clinic. After three months, qualitative feedback was obtained from the involved professional groups, patient satisfaction was measured using PREMs, and billing was analysed using TARDOC tariffs and physiotherapy/occupational therapy tariffs.

Results: The interprofessional clinic enabled a 22% increase in patients seen compared with separate hand surgery and therapy consultations. Daily revenue from the tariffs increased by 23% for the hand surgeons. Therapists valued improved insight into medical decision-making and closer interdisciplinary collaboration. Surgeons reported effective delegation of standardised follow-up appointments. Patient satisfaction remained comparable, with no significant differences detected.

Discussion: This pilot project demonstrates that AP roles in hand therapy are feasible and effective in a hospital outpatient setting. They help relieve surgical capacity constraints without compromising patient experience. Further development and national implementation of AP roles in Switzerland should be encouraged.

A-0726 CLINICAL OUTCOMES OF K-WIRE FIXATION IN ACUTE AND CHRONIC Mallet FINGER DEFORMITIES: A RETROSPECTIVE REVIEW

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Introduction: Clinical Outcomes of K-Wire Fixation in Acute and Chronic Mallet Finger Deformities: A Retrospective Review

Aim: Mallet finger results from disruption of the terminal extensor mechanism at the distal phalanx. While splinting is sufficient for most uncomplicated cases, surgical treatment becomes necessary in open injuries, displaced fractures or when deformity progresses into the chronic stage. This study evaluates functional outcomes and complication patterns in patients treated with K-wire fixation, comparing acute injuries with chronic deformities over a recent three-year period.

Material & Methods: A retrospective review was conducted on 2023–2025 cases, including 41 patients (43 fingers) who underwent operative treatment using K-wire fixation techniques. K-wire transfixation of the distal interphalangeal (DIP) joint was performed in all cases, and direct tendon repair was added when needed. Postoperative immobilization was maintained for 4–6 weeks, followed by structured rehabilitation. Outcomes were assessed through functional recovery, extension quality (categorized as “locked,” “partially locked,” or “minimal loss”), and total active motion trends.

Results: Most acute cases achieved satisfactory extension, with the majority showing locked or near-locked DIP alignment

post-treatment and minimal residual extension loss. However, fracture-associated mallet injuries demonstrated more pronounced motion limitations during follow-up, regardless of fixation quality. Complication rates were low and included transient stiffness and occasional nail irregularities.

Chronic mallet deformities required significantly longer rehabilitation, and the overall functional improvement in this group was more modest, with many patients reporting persistent mild extension deficits or limited motion gains despite treatment

Conclusions: K-wire fixation offers reliable correction and stable extension in acute mallet injuries, especially in soft-tissue cases. Fracture-associated mallets show greater residual motion limitation, indicating a more guarded prognosis. Chronic deformities benefit from surgery to a degree, but their longer rehabilitation demands and reduced overall response highlight the importance of early diagnosis and timely intervention.

A-0727 HUMAN OLFACTORY STEM CELL-DERIVED EXTRACELLULAR VESICLES ENHANCE NERVE GAP REPAIR IN RATS

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INTRODUCTION : Peripheral nerve injuries are frequent and these injuries often cause lasting pain, weakness, and loss of independence. Despite progress in microsurgery, recovery remains limited especially after nerve gap repairs - only one in two patients regain protective sensation or the ability to move the affected limb against gravity. There is an urgent need for regenerative solutions that can truly restore nerve function. Olfactory ecto-mesenchymal stem cells (OEMSC), sharing a developmental lineage with peripheral nerves, exhibit unique neurogenic properties, making them theoretically an ideal cell lineage for nerve regeneration. Our hypothesis is that Extracellular vesicles (EVs) derived from human OEMSC promote peripheral nerve regeneration following a nerve gap injury. Furthermore, we hypothesize that cryoconserved EVs retain regenerative potential, offering a viable, cell-free regenerative therapy, off-the-shelf alternative to freshly purified EVs. **AIM:** Evaluate whether EVs derived from human OEMSC enhance peripheral nerve regeneration following a nerve-gap injury in rats, and to determine whether cryoconserved EVs maintain comparable regenerative efficacy to freshly isolated EVs. **METHODS:** A 7mm peroneal nerve gap was bridged with a 1.5 cm femoral vein. Rats were divided into five groups: Control (no surgery), Gold Standard (GS: nerve autograft), Vein Graft (VE), Vein Graft + Freshly Purified EVs (VE-fEV), and Vein Graft + Cryoconserved EVs (VE-cEV) (n=7 rats per group). Functional recovery was assessed weekly from Week 1 to 12 using the Peroneal Functional Index (PFI). Electrophysiological and histological analyses evaluated nerve regeneration, muscle mechanical properties, and myelination. Afferent nerve activity was recorded in response to electrically induced fatigue and metabolic stimulation (KCl, lactic acid injection). Statistical analyses included Kruskal-Wallis, Dunn's post-hoc test, and the Scheirer-Ray-Hare test, with $p < 0.05$ considered significant.

RESULTS: Locomotor Recovery: Both freshly purified and cryoconserved EVs significantly improved PFI scores from Week 7 to Week 12 ($p < 0.05$ to $p < 0.001$) compared to GS and VE groups. Notably, cryoconserved EVs retained functional efficacy, though fresh EVs yielded slightly better results.

Muscle Function: Fresh EVs preserved contractile muscle properties with significant improvement in contraction and relaxation rates ($p < 0.05$ vs. GS), while cryoconserved EVs showed a similar but slightly reduced effect. Neither EV type prevented muscle atrophy. **Nerve Regeneration:** EV treatment significantly increased axon numbers in the medial ($p < 0.01$) and distal ($p < 0.001$) segments compared to the VE group. Cryoconserved EVs exhibited comparable regenerative effects to fresh EVs, highlighting their potential for long-term storage applications. Myelination (g-ratio) showed a non-significant

trend toward improvement. No significant differences were observed in afferent nerve responses to electrically induced fatigue or metabolic stimulation.

CONCLUSION: OEMSC-derived EVs significantly improve locomotor recovery and nerve regeneration compared to Gold Standard treatment. Axonal regrowth is enhanced by OEMSC-derived EVs, though myelination trends toward improvement without statistical significance. Freshly purified OEMSC-derived EVs better preserve muscle contractile function, but muscle atrophy remains unchanged across all groups. Cryoconserved EVs retain regenerative potential, making them a promising, clinically viable alternative to freshly purified EVs. OEMSC-derived EVs present a scalable, cell-free therapeutic approach for peripheral nerve repair, with cryoconservation enabling future off-the-shelf application.

A-0728 RESTORING BALANCE OF THE BURNED HAND: A TISSUE-SPARING PATHWAY TO PRESERVE FUNCTIONAL EQUILIBRIUM

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Introduction: Deep circumferential burns of the upper limb disrupt tissue perfusion and the biomechanical balance that enables coordinated hand function. While escharotomy is the standard emergency intervention, it does not address acute changes in tendon gliding, intrinsic–extrinsic muscle balance, or tissue stiffness emerging in the first 72 hours post-burn. Bromelain-based enzymatic debridement is a selective early eschar removal method, but its potential to preserve hand functional balance (the interplay of motion, force, and sensation) remains under-investigated.

Aim: To assess whether early enzymatic eschar removal combined with a balance-focused rehabilitation program better preserves hand functional equilibrium than standard surgical escharotomy in patients with deep circumferential burns of the hand or forearm.

Material & Methods: A prospective controlled study included 36 adults with deep circumferential burns of the hand or forearm. Group E (n=18) received bromelain-based enzymatic eschar removal within 48 hours of injury plus an early balance-oriented hand rehabilitation program targeting differential tendon gliding, intrinsic muscle rebalancing, and micro-mobility via splinting. Group S (n=18) received standard surgical escharotomy ($\pm$ fasciotomy) and standard postoperative hand therapy. Primary endpoints included three measures of functional balance: (1) tendon gliding efficiency (fingertip displacement per tendon excursion via ultrasound motion tracking); (2) intrinsic–extrinsic coordination index (IECI, based on lumbrical activation timing and finger cascade symmetry); (3) grip–pinch balance ratio (GPB, ratio of precision pinch to power grip force). Secondary outcomes were edema resolution time, thermal sensibility, time to wound stability, and need for grafting. Follow-up was 6 months.

Results: Baseline demographics and burn characteristics were similar between groups. Enzymatic treatment (Group E) achieved full eschar clearance in 94% of patients without additional surgical release, and wound stabilization was significantly faster (median 11 vs 19 days, $p=0.003$). By 6 weeks post-burn, Group E showed superior functional balance: tendon gliding efficiency was higher (0.78 vs 0.63, $p<0.001$); intrinsic–extrinsic coordination was closer to normal (IECI deviation 14% vs 29%, $p=0.01$); and grip–pinch ratio approached normal (1.32 vs 1.48, $p=0.02$).

Edema subsided faster in Group E (3.4 vs 5.1 days to 50% reduction), and thermal sensibility at 3 months was better preserved. Grafting rates were similar (39% vs 44%), but graft integration was faster in Group E. At 6 months, Group E attained higher overall hand function (QuickDASH median 13 vs 22, $p=0.01$) and superior fine motor coordination (Purdue Pegboard test). Patients in Group E also reported smoother, more controlled hand movements in daily tasks.

Conclusions: These improvements suggest that the tissue-sparing enzymatic approach, combined with balance-focused rehabilitation, preserves the subtle biomechanical harmony of the hand better than standard care and merits integration into burn management protocols.

A-0729 COMPARATIVE OUTCOMES OF REVERSE CROSS-FINGER SUBCUTANEOUS FLAPS AND STANDARD CROSS-FINGER FLAPS IN FINGER RECONSTRUCTION

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Introduction: Reverse cross-finger subcutaneous flaps have been widely used for the reconstruction of small to medium sized dorsal and volar finger defects. Their vascular supply is derived from the palmar digital arterial anastomosis, while sensory recovery benefits from anastomotic connections between the dorsal and pulp sensory branches. Standard cross-finger flaps, although commonly used for volar injuries, tend to be thicker and demonstrate slower sensory recovery. This study compares sensory, functional, and aesthetic outcomes between these two techniques.

Aim: After standard preparation, the flap was designed on the middle phalanx dorsum, approximately 1 cm longer and 4–5 mm wider than the defect. A full-thickness skin flap and subsequently the subcutaneous flap were elevated. The reversed subcutaneous flap was inset, and the intact skin island was sutured back to the donor finger. Elevation at the extensor paratenon level preserved dorsal perforators. A full-thickness skin graft covered the reversed surface. The dressing was removed on postoperative day five, and the interdigitating flap was divided at approximately three weeks under local anesthesia.

Material & Methods: Between November 2024 and November 2025, six patients underwent reconstruction with reverse cross-finger subcutaneous flaps (five dorsal defects and one D1 pulp defect), and six with volar injuries received standard cross-finger flaps. Demographic data, injury characteristics, defect location, graft use, complications, and return to work times were recorded. At six months, joint range of motion (ROM), cold intolerance, static two-point discrimination, and functional recovery were evaluated against the contralateral finger. The aim was to determine whether meaningful differences existed in sensory recovery, contour, donor site morbidity, and rehabilitation.

Results: Static two-point discrimination was significantly improved in the reverse flap cohort, a finding attributed to the earlier reinnervation potential afforded by the preserved dorsal volar digital nerve anastomosis. This enhanced sensory recovery reflects the inherent neural continuity of the subcutaneous flap, whereas standard cross-finger flaps depend on slower secondary reinnervation.

Reverse flaps also provided better dorsal contour due to their thinner structure and more favorable vascular pattern, while standard flaps tended to appear bulkier. Although six-month ROM values were comparable, patients in the reverse flap group achieved earlier functional recovery because immobilization time was shorter. Donor-site morbidity was likewise reduced, as preservation of the skin island facilitated more favorable healing compared with the full-thickness harvest required in standard flaps.

Both techniques demonstrated reliable survival without major complications. Venous congestion was observed less frequently in reverse flap patients, likely due to the preserved vascular architecture. These findings support the reverse cross-finger subcutaneous flap as a strong reconstructive option, particularly for dorsal and pulp defects where contour and early sensory function are priorities.

Conclusions: Reverse cross-finger subcutaneous flaps demonstrated sensory recovery, favorable contour, early functional return, and reduced donor-site morbidity compared with standard cross-finger flaps. While both flaps remain dependable

for appropriate indications, the reverse technique offers distinct advantages in dorsal and pulp reconstruction due to its thin pliable tissue and capacity for early reinnervation.

A-0730 BALANCING EFFICACY AND PATIENT EXPERIENCE: A COMPARATIVE STUDY OF ULTRASOUND-GUIDED PERCUTANEOUS VS. OPEN A1 PULLEY RELEASE

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Introduction: Trigger finger (stenosing flexor tenosynovitis) disrupts the delicate balance between tendon mobility and pulley restraint, leading to impaired hand function through painful locking or catching of the digit. Restoring this biomechanical balance is central to regaining coordinated, pain-free hand use. While open A1 pulley release is the standard surgical treatment, ultrasound-guided percutaneous release offers a less invasive option that may reduce tissue trauma and enhance recovery. Given the increasing emphasis on patient-centered care, it is essential to assess not only surgical efficacy but also functional recovery, pain, satisfaction, and esthetic outcomes. This study compares clinical and patient-related outcomes between percutaneous and open A1 pulley release for trigger finger.

Aim: To compare ultrasound-guided percutaneous versus open A1 pulley release in terms of clinical effectiveness, safety, and patient related outcome in adults with primary trigger finger.

Material & Methods: A retrospective cohort study was conducted including 264 trigger finger cases treated between May 2024 and October 2025. Patients were divided into two groups: ultrasound-guided percutaneous release (n=72) and open release (n=192). Baseline variables included age, sex, diabetes status, smoking, occupation (manual vs non-manual), multiple finger involvement, affected digit, and preoperative Green-Quinnell grade. Outcome measures included trigger resolution, postoperative complications, and need for postoperative corticosteroid infiltration. Statistical comparisons used chi-square or Fisher's exact tests for categorical data and Mann-Whitney U tests for continuous variables. Patient-reported outcome measures (pain, function, satisfaction, return to activity) were collected prospectively and are being analyzed.

Results: Demographic characteristics were comparable between groups, although smoking was more frequent in the ultrasound group (12.5% vs 4.2%, $p=0.03$). Green-Quinnell grades were mostly II–III in both groups. The middle finger was most commonly affected (33%), followed by the thumb (27%) and ring finger (25%). Complete resolution of triggering was achieved in nearly all cases (100% ultrasound vs 99.5% open, $p>0.05$). Postoperative corticosteroid infiltration was required in 1.4% of ultrasound and 4.2% of open cases ($p=0.45$). Complication rates were significantly lower in the ultrasound group (2.8%) than in the open group (10.4%, $p=0.04$); all were minor. These results demonstrate that ultrasound-guided percutaneous A1 pulley release is not inferior to open surgery in achieving clinical resolution, with a lower complication burden. Detailed patient-reported outcome measures—including return to activities, pain, esthetic satisfaction, and functional scores—are currently under analysis and will be presented at the congress to further explore whether the minimally invasive approach provides a more favorable balance between procedural success and patient-centered recovery.

Conclusions: Ultrasound-guided percutaneous A1 pulley release achieves comparable resolution rates to open surgery while maintaining a lower complication rate. Ongoing analysis of patient-reported outcomes will clarify whether this minimally invasive approach offers a superior balance between effectiveness and recovery from the patient's perspective.

A-0731 BIPARTITE SCAPHOID MISDIAGNOSED AS SCAPHOID FRACTURE BY AI-ASSISTED RADIOLOGIC INTERPRETATION: A FIVE CASE SERIES

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Introduction: Bipartite scaphoid is a rare congenital variation resulting from the absence of fusion between the os centrale carpi and the radial chondrification centre. Often asymptomatic, it can be misinterpreted as a fracture or nonunion, leading to inappropriate immobilization or unnecessary surgical planning. AI-assisted radiologic interpretation has improved the detection of carpal and wrist fractures, but rare anatomical variations remain underrepresented in training datasets, increasing the risk of misclassification.

Aim: To describe a series of bipartite scaphoid cases initially misinterpreted as scaphoid fractures by AI-assisted radiologic analysis, and to identify the morphometric criteria that differentiate this variant from a true scaphoid nonunion.

Material & Methods: Five adult patients with bipartite scaphoids were retrospectively included after wrist trauma with suspected scaphoid fracture. Clinical examination was performed routinely, and standard wrist radiographs (AP and scaphoid views) were analysed by an AI-assisted radiologic system that diagnosed all cases as scaphoid fractures. Three-dimensional CT imaging was performed for all patients, supplemented by SPECT/CT in two cases. Three-dimensional imaging enabled detailed morphometric assessment of fragment volume, shape, contour regularity, position, and cortical continuity of the main scaphoid.

Results: Three-dimensional CT revealed in all five patients two separate osseous structures with smooth, regular contours and no sclerosis or lytic changes, consistent with a congenital bipartite scaphoid. The distal fragment was consistently smaller than the main scaphoid. It showed an ovoid or bean-like shape oriented along a proximodistal axis, with smooth, regular contours and no evidence of remodeling. It was always located distally, most often adjacent to the scaphoid tubercle. The main scaphoid maintained uninterrupted cortical continuity, clearly distinguishing this configuration from a typical nonunion. In the two patients who underwent SPECT/CT, the absence of increased tracer uptake supported a nonprogressive condition.

Conclusions: This series highlights the limitations of AI-assisted radiologic analysis in identifying rare anatomical variations and underscores the importance of three-dimensional CT imaging whenever standard radiographs raise uncertainty.

A-0732 OUTCOMES OF SEMI-CONSTRAINED DRUJ ARTHROPLASTY

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Introduction: Symptomatic DRUJ arthritis can be a challenging clinical problem for hand surgeons. Ulnar head implants have recently been difficult to use due to regulatory and manufacturing issues. Semi-constrained DRUJ arthroplasty has been used with improvement in clinical outcomes, especially for unstable DRUJ arthritis. Good results have been reported as well as series with complications.

Aim: To assess clinical outcomes and reoperation rates with semi-constrained DRUJ arthroplasty in our institution between 2012–2024.

Material & Methods: We identified 44 implants in 39 patients who underwent surgery for symptomatic DRUJ arthritis with a semi-constrained joint arthroplasty in our hand surgical unit between 2012 and 2024. Consent for participating in the study was given for 35 implants/30 patients. The mean age of the patients was 52 (range 27–74) years. The average

number of previous surgeries was 2.2 (range 0 -12). The indications were arthritis with pain and instability in 14 cases, pain and impingement after Darrach resection in ten cases, arthritic deformity with Madelung deformity in five cases, arthritic pain alone in one case, and pain with a previous ulnar head implant in five cases. Pain level, ROM, grip strength, and complications were recorded. PRWHE and Q-DASH were collected. Mayo Wrist Scores were calculated. For statistical analysis, descriptive statistics and p-values for pre- to postoperative values were calculated.

Results: The PRWHE improved from a mean of 62 to 28, and the mean Quick Dash improved from 59 to 31. The Mayo Wrist Score improved from a mean of 31 to 66. The pain score during activity decreased from 7.8 to 3.1. The grip strength increased from a mean of 18.7 to 23.6 kg postoperatively. The supination increased from a mean of 66° to 79° while the pronation stayed stable. The follow-up time was a median of 3,6 years. Nine patients had reoperations related to the implant. Four had periprosthetic fractures in the initial months after surgery, four had surgery due to ECU tendinitis, and one had shortening of a long radial screw. All implants were salvaged

Conclusions: Semi-constrained DRUJ arthroplasty is a valuable option for selected DRUJ problems. Pain, supination, self-reported symptoms, and strength tests improved in our patients. As in many forms of arthritic DRUJ surgery, some residual complaints were not uncommon.

A-0733 SOLID TUMORS OF THE HAND: A 13-YEAR RETROSPECTIVE ANALYSIS

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Introduction: The hand consists of various complex anatomical units and histological tissues, making it susceptible to a broad spectrum of solid tumors. Despite their relative frequency in the setting of a specialized hand surgery practice, diagnostic and therapeutic challenges arise due to tumor heterogeneity. A comprehensive understanding of tumor-specific characteristics is essential for accurate diagnosis and optimal management. This study presents our institutional experience to enhance clinical insight into solid hand tumors.

Aim: The aim of this study was to describe the demographic, anatomical, and histological characteristics of solid tumors of the hand managed at our referral center over a 13-year period, with particular focus on tumor locations, age and sex distribution.

Material & Methods: We conducted a retrospective study including all histologically confirmed solid tumors of the hand and wrist treated between January 2012 and May 2025. Data collected included age, sex, tumor location, and histological diagnosis.

Results: A total of 513 patients were included (277 women and 236 men), with a mean age of 54 years. The most frequent tumor locations were the digits (38.2%). Histological analysis showed a predominance of benign lesions, with giant cell tumor of the tendon sheath being the most frequent (45.6%), followed by lipomas (15,3%), glomus tumors (10,9%), histiocytomas (8.8%), hemangiomas (3.2%), and squamous cell carcinoma (2.9%), which is consistent with the typical spectrum of solid tumors encountered in hand surgery. Rare tumor types and sarcomas were also identified, emphasizing the importance of systematic histopathological evaluation.

Conclusions: These findings highlight the significant anatomical and clinical variability of solid hand tumors and emphasizes the importance of a thorough diagnostic approach, including targeted complementary investigations tailored to the suspected lesion.

A-0734 RESTORING UPPER EXTREMITY BALANCE: FUNCTIONAL REEQUILIBRATION THROUGH FREE FLAP RECONSTRUCTION IN COMPLEX CONTRACTURES

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Introduction: Upper extremity contractures not only restrict joint range of motion but also disrupt the biomechanical, functional, and aesthetic balance of the limb. The inelastic nature of scar tissue compromises the coordinated motion chain and leads to segmental imbalance across adjacent joints. In complex cases, free tissue transfer offers more than simple contracture release; it restores pliable soft tissue, enables multi-planar joint mobility, and re-establishes global upper extremity harmony. For this reason, free flaps represent a critical reconstructive option in patients with extensive scarring or multilevel motion deficits, providing a comprehensive solution to both mechanical restriction and tissue deficiency.

Aim: The aim of this study is to evaluate the impact of free flap reconstruction on joint mobility, functional balance, and patient-reported outcomes in individuals with upper extremity contractures. In accordance with the main theme of the congress, the study emphasizes how reconstructive surgery contributes to the restoration of “upper extremity balance” through biomechanically sound tissue replacement.

Material & Methods: A retrospective analysis was conducted on 25 patients who underwent free flap reconstruction for upper extremity contractures between January 2023 and August 2025. The mean age was 29.1 ± 6.8 years, and most contractures resulted from burn or post-traumatic scarring. The free flaps utilized included the anterolateral thigh (ALT) flap (12 patients), the profunda artery perforator (PAP) flap (7 patients), and the thoracodorsal artery perforator (TDAP) flap performed as a true free flap (6 patients). Preoperative joint range of motion was recorded for all patients, followed by standardized goniometric assessments at postoperative one and three months. Functional outcomes were examined using the RAPID–DASH questionnaire, while subjective results were evaluated through patient satisfaction surveys. The mean follow-up duration was 13.6 ± 3.9 months.

Results: All patients demonstrated marked improvement in joint mobility. Mean shoulder abduction increased from 72° to 124° , elbow flexion from 60° to 129° , and wrist dorsiflexion from 16° to 49° . By the third postoperative month, the average gains were 52° in shoulder abduction, 71° in elbow flexion, and 33° in wrist dorsiflexion, all statistically significant ($p < 0.01$). RAPID–DASH scores improved by an average of 68%, reflecting substantial enhancement in movement fluidity, joint coordination, and overall functional equilibrium of the upper extremity. Patient satisfaction averaged 8.6 out of 10, with patients noting both functional improvement and restoration of visual symmetry as major contributors to satisfaction. The complication rate was low; two patients experienced minor issues such as superficial infection or limited partial loss, all resolved with conservative management. No total flap loss occurred. The ALT flap provided reliable bulk and stable reconstructive coverage, while the free TDAP flap, owing to its thin and highly mobile nature, proved especially advantageous in regions requiring multidirectional motion and fine biomechanical balance. This study demonstrates that free flap reconstruction not only releases contracture but also re-establishes biomechanical integrity, inter-joint motion continuity, and aesthetic harmony. These findings underscore the role of free flaps as a comprehensive and effective modality for restoring upper extremity balance in complex contracture cases.

A-0735 PATIENT EXPECTATIONS IN HAND CARE: VARIATION ACROSS CONSULTATION STAGES AND DIAGNOSES

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Introduction: Hand disorders often disturb not only the anatomical or biomechanical balance required for optimal function, but also the balance between what patients hope to gain and what clinicians can realistically provide. Expectations therefore play a central role in shaping satisfaction, adherence and perceived success of treatment. Most available studies in hand surgery describe expectations in surgical patients, typically highlighting pain relief and functional improvement as major concerns. Much less is known about what patients expect when they first seek care, or how these priorities vary across the diverse clinical scenarios encountered in hand and wrist practice. Because hand disorders differ in functional implications and often evolve over time, understanding how expectations shift according to consultation stage, personal context and diagnosis may clarify what patients truly need at each point of their clinical journey.

Aim: To describe the expectations of patients attending a specialist hand clinic and analyse how these expectations vary according to consultation type, demographic characteristics, employment status and diagnosis.

Material & Methods: A descriptive cross-sectional study was conducted in a university referral hospital from March to June 2025. Consecutive adults completed a questionnaire before clinical assessment, listing up to three expectations for the consultation or treatment. Open-ended responses were coded independently by two researchers into 14 thematic domains, with discrepancies resolved by consensus. Recorded variables included age, sex, employment status, consultation type (first visit, second opinion, conservative treatment or preoperative evaluation) and final diagnosis. Descriptive statistics summarised expectation frequencies. Associations between expectations and patient characteristics were analysed using chi-square or Fisher's exact tests, with adjusted standardised residuals identifying the categories driving significant associations.

Results: A total of 183 patients were included. The most frequent first expectations were pain relief, understanding the condition and preventing worsening. Expectations varied substantially across consultation types: first visits and second opinions were mainly associated with informational goals, whereas conservative and preoperative evaluations prioritised symptom control and function. Age and employment status also influenced expectations, with younger and working individuals focusing more on information and prevention, and older or retired patients more often seeking pain reduction. Diagnostic groups showed distinct patterns: osteoarthritis and fractures were predominantly linked to pain relief; Dupuytren disease to preventing deterioration; neuropathies to sensory and mobility-related concerns; and ligament injuries to understanding the underlying problem. Overall, expectations reflected the interplay between pathology, personal circumstances and the point reached in the care pathway.

Conclusions: Patient expectations in hand and wrist care are diverse and shift with clinical context. Differences across consultation types, demographic groups and diagnoses indicate that patients pursue distinct goals rather than a single, uniform set of priorities. Accordingly, understanding these nuances may help clinicians tailor communication, anticipate needs and strengthen shared decision-making. Communication, when used with intention and clarity, becomes a therapeutic act—an instrument as powerful and as necessary as the scalpel we hold Patient Expectations in Hand Care: Variation Across Consultation Stages and Diagnoses

A-0736 HOMODIGITAL DORSAL ADIPOFASCIAL FLAP FOR FINGER RECONSTRUCTION IN HAND SURGERY: OUR EXPERIENCE

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Introduction: The anatomy of the dorsum of the hand has peculiar features comparing to the palmar side; the exiguous depth of extensor tendon apparatus and the underlying bone makes their exposition and subsequent damage more frequent than with volar side injuries.

Furthermore, finger reconstruction of this side has to take in account structures as the nail lamina, the nail bed and the nail matrix.

Technical progress in the biomedical field made available new solutions in the reconstructive toolbox for the hand surgeon, such as dermal substitutes (e.g. Integra, Nevelia, etc.).

Nevertheless, the dorsal homodigital adipofascial flap still represents a good and cost effective alternative.

Aim: Here we present the step-by-step surgical technique for this flap with clinical and intraoperative pictures to ease its reproduction. We also present the most common complications of this flap and our solutions to deal with them.

Material & Methods: The case serie we briefly present shows the possible applications of this flap for a 1) finger osteomyelitis of the 3rd phalanx, 2) a complex skin loss and extensor tendon injury at the distal interphalangeal joint, and 3) a fingertip reconstruction of a fingertip, with the most frequent complications that surgeons might face.

Results: Clinical results are presented to consolidate the reliability and effectiveness of this flap

Conclusions: With the clinical cases and complications here illustrated we hope to contribute to enrich the hand surgeon's reconstructive toolbox.

A-0737 COMBINED SURGICAL AND RADIOLOGICAL INTERVENTION FOR DUPUYTREN'S DISEASE: EARLY PROGRESSION AND HAND FUNCTION OUTCOMES

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Introduction: Dupuytren's disease (DD) is a benign, progressive fibroproliferative disorder that disrupts the balance between collagen deposition and degradation within the palmar fascia, resulting in nodules, cords, and flexion contractures that compromise hand function.[1] Surgical and enzymatic treatments—such as limited fasciectomy, needle aponeurotomy, and collagenase injections[2,3]—exist. Early-stage non-invasive interventions like radiation therapy (RT) may reduce fibroblast activity and slow progression,[4,5] yet outcomes in patients receiving both surgery and RT remain limited.

Aim: To evaluate short-term progression and complications in DD patients treated with a sequential RT-surgery regimen.

Material & Methods: A retrospective analysis was performed on 61 patients (85 hands) treated with RT for DD at our institution between 2015 and 2025 at our institution. Surgical history, timing of RT relative to surgery, pre-RT and pre-surgery disease stage, and post-RT and post-surgery outcomes were collected in REDCap. RT fields encompassed clinically defined areas of nodularity or cording; most extremities received 30Gy in 10 fractions with en face electron therapy (6–12 MeV) and custom bolus. Outcomes were analyzed per extremity. Surgical intervention was defined as any fasciectomy. Progression was defined as increased contracture or nodularity at follow-up after completing treatment. Descriptive statistics, crosstabs, and univariate logistic regression were performed using SPSS.

Results: Of the 85 treated extremities, 10 (11.8%) had prior surgery; these demonstrated a modal Tubiana Stage I, compared with Stage N for RT-only extremities. At initial follow-up (median 5.5 months), progression rates were similar between prior-surgery (10.0%) and RT-only (9.3%) extremities. Overall, 12 extremities (14.1%) required post-RT surgical salvage; prior surgery did not predict need for salvage, and salvage cases did not exhibit higher rates of RT-related erythema, pruritus, dry desquamation, or pigmentation changes, or higher rates of manual labor, trauma, or rapid progression. Patients undergoing both RT and surgery were more likely to have a personal history of DD (77.8% vs. 51.8%; $p = 0.078$). Surgical complications were limited to swelling, temporary numbness, and reduced PIP joint flexion, with no infections. **Conclusions:** In this cohort, sequential RT and surgical intervention were well-tolerated and achieved short-term disease stability comparable to RT alone. Prior surgery did not increase the likelihood of early progression or the need for post-RT surgical salvage, suggesting that combined-treatment patients may have had more aggressive DD. Surgical-salvage patients did not exhibit higher rates of RT-related skin toxicity or clinical risk factors. However, they were more likely to have a personal history of DD, indicating an underlying predisposition to recurrent fibroproliferation. Postoperative complications after surgical salvage were limited, and no infections occurred. Preliminary patterns suggest that a shorter time between RT and surgery (< 1 year) may be associated with fewer recurrences than delayed sequential treatment, but larger studies are needed to confirm timing effects. Overall, these findings indicate that RT can be safely integrated with surgery and may help stabilize disease in patients with more active DD.

A-0738 FUNCTIONAL AND RADIOLOGICAL RESULTS OF ADVANCED KIENBÖCK'S DISEASE TREATMENT USING FREE VASCULARIZED MEDIAL FEMORAL CONDYLE GRAFTS

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Background: Avascular necrosis of the lunate (Kienböck's disease) is rare and is one of the main causes of progressive, painful wrist arthritis requiring surgical intervention. Various approaches have shown benefits in treating Kienböck's disease but remain limited. This study aims to analyze the functional and radiological outcomes of patients with advanced Kienböck's disease (Lichtman stage IIIb and above) who were treated in our clinic between 2020 and 2025 using medial femoral condyle free vascularized bone grafts (VBGs) as the first-line treatment.

Materials and Methods: This retrospective analysis included 12 patients with Kienböck's disease who underwent microsurgical revascularization or reconstruction of the lunate using medial femoral condyle free vascularized bone grafts between 2020 and 2024. Characteristics of lunate necrosis and postoperative functional and radiological outcomes were reviewed.

Results: Osteochondral VBGs were used in all 12 patients for lunate reconstruction. No postoperative complications, including median nerve irritation or donor/recipient site infection, were encountered. All patients demonstrated complete graft healing at 12-month follow-up, with acceptable functional and radiological outcomes.

Conclusions: Medial femoral condyle free vascularized bone grafting represents a reliable method for lunate reconstruction in advanced Kienböck's disease (Lichtman stage IIIb and above).

Keywords: Kienböck's disease · Avascular bone necrosis · Lunate · Medial femoral condyle · Bone reconstruction · Vascularized bone graft · Microsurgery · Bone flap

A-0739 BENNETT'S FRACTURE: A SMALL BREAK WITH A BIG FUNCTIONAL IMPACT

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Introduction: Bennett's fracture is an intra-articular and inherently unstable fracture at the base of the first metacarpal. Even though the fracture line is small, the resulting instability can lead to major functional impairment. This study evaluates treatment modalities, radiological reduction quality, and functional outcomes using comparative statistical analysis.

Aim: The aim of this study is to evaluate the effectiveness of different treatment modalities for Bennett's fracture by comparing radiological reduction quality, bone healing, and functional recovery outcomes. Additionally, the study aims to determine the impact of anatomical reduction on long-term thumb stability and hand function, using statistical analyses to identify the most reliable treatment approach.

Material & Methods: A retrospective review was performed on 18 patients treated for Bennett's fracture between 2023 and 2025. Evaluated parameters included demographics, mechanism of injury, treatment method (screw fixation, K-wire fixation, or conservative treatment), radiological measures (step-off, axial angulation), functional outcomes (grip strength, opposition score, DASH), and bone healing time. Statistical analysis used ANOVA and Mann-Whitney U tests with significance at $p < 0.05$.

Results: Although small in appearance, Bennett's fracture can significantly compromise thumb stability.

Screw fixation yielded superior radiological and functional recovery. Early anatomical reduction and structured rehabilitation are critical for optimal outcomes.

Conclusions: Although small in appearance, Bennett's fracture can significantly compromise thumb stability.

Screw fixation yielded superior radiological and functional recovery. Early anatomical reduction and structured rehabilitation are critical for optimal outcomes.

A-0740 FUNCTIONAL OUTCOMES OF INFERIOR TRAPEZIUS TRANSFER TO INFRASPINATUS USING THE ELHASSAN TECHNIQUE IN PATIENTS WITH BRACHIAL PLEXUS INJURY

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Introduction: Traumatic brachial plexus injuries in adult patients are a devastating condition with profound physical, psychological, social, and economic consequences. Loss of active external rotation of the shoulder leads to the "hand-on-belly" sign, significantly limiting upper-limb function. In our country, there are no published studies reporting the functional outcomes of this type of muscle transfer, which underscores the scientific value of the present study.

Aim: To evaluate the functional outcomes of inferior trapezius transfer to the infraspinatus using the Elhassan technique in patients with brachial plexus injury.

Material & Methods: This was an observational, retrospective, cross-sectional study in which the medical records of 18 adult patients with brachial plexus injury who underwent inferior trapezius transfer to the infraspinatus for restoration of shoulder external rotation were reviewed. From the records, we collected data on external rotation, the Disabilities of the Arm, Shoulder and Hand (DASH) score, and the Mallet score at 6 months postoperatively.

Results: A total of 18 records were analyzed, with a mean patient age of 26.22 years. Male patients were more frequently affected (88.9%), and the dominant upper limb was involved in 61.1% of cases. At 6 months postoperatively, the mean DASH score was 31.08 points, the mean Mallet grade was III, and the mean active external rotation was 14.72°.

Conclusions: Inferior trapezius transfer to the infraspinatus using the Elhassan technique is a safe treatment option that provides satisfactory functional outcomes in adult patients with brachial plexus injury, allowing partial restoration of shoulder external rotation.

A-0741 MUSCLE-RIB FLAP TRANSFER FOR RECONSTRUCTION OF COMPOSITE UPPER LIMB DEFECTS

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Introduction: Direct traumatic open fractures or their complications represent the main etiology of bone defects. If soft tissue defects are also present, the management of these lesions becomes more challenging. The most used flaps in these cases are the vascularised fibula osteoseptocutaneous flap, the vascularised iliac osteocutaneous flap, and the vascularised muscle-rib flap. we previously reported about the advantages and the few complications by using the muscle-rib flap, and about the advantages of all-in-one reconstruction in in complex injuries of the limbs involving both bone and soft tissue defects by using these flaps.

Aim: To demonstrate the possibility of using muscle-rib flaps in solving big complex defects in the upper extremity

Material & Methods: The study refers to 32 patients operated for acute or sequelar traumatic composite bone and soft tissue defects in upper limb, between March 1997 and March 2023, 8 females and 24 males, with an average age of 30,5 years (range, 5 to 66 years). The etiology of the defects was an acute trauma in 17 cases, and a posttraumatic complication in 15 cases. The average length of the bone defect was 5.2cm (range, 3 to 8cm), and the surface of soft tissue defect ranged between 6 and 475sqcm. The flap used was the serratus anterior-rib in 14 cases, the latissimus dorsi-rib in 11 cases, and the latissimus dorsi-serratus anterior-rib in the remaining 7 cases; 23 were free flaps, and 9 pedicled flaps.

Results: The average follow-up in our 32 patients was 23.1 months (range, 12 to 48 months). We had complete flap survival in all the cases. In only one case we registered a superficial wound infection, which was solved consecutively. Regarding the long-term results, we registered a rate of bone union in 100%, with an average time of 6.6 months.

Conclusions: The vascularised rib(s) as part of a composite flap represents a good indication in bone defects associated with large soft tissue defects.

A-0742 EVALUATION OF SHOULDER COMPLEX IN INDIVIDUALS WITH TYPE II DIABETES

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Introduction: Aim: To evaluate shoulder joint range of motion, muscle strength, proprioception, skapular dyskinesia and upper extremity functionality in individuals diagnosed with type II diabetes.

Material & Methods: The study included 32 individuals diagnosed with Type II diabetes mellitus and 38 non-diabetic individuals aged 50–65. Shoulder joint range of motion was assessed using a digital goniometer. Muscle strength was measured with a digital dynamometer. Proprioception was evaluated using a laser pointer. Upper extremity functionality was assessed with the Upper Extremity Closed Kinetic Chain Stability Test and the Upper Extremity Functional Index.

Scapular dyskinesis was evaluated using the Lateral Scapular Slide Test and the Observational Scapular Dyskinesis Test. Results: Individuals diagnosed with Type 2 diabetes mellitus demonstrated significantly lower shoulder joint range of motion in flexion, abduction, and right external rotation compared to non-diabetic individuals ($p < 0.05$). Internal rotation muscle strength was also significantly lower in individuals with Type 2 diabetes than in healthy controls ($p < 0.05$). Moreover, individuals with Type 2 diabetes exhibited significantly greater deviations in left arm flexion and abduction at 90° and 125° compared to non-diabetic individuals ($p < 0.05$). The Upper Extremity Closed Kinetic Chain Stability Test score and the Upper Extremity Functional Index score were significantly lower in individuals with Type 2 diabetes than in healthy controls ($p < 0.05$). However, no statistically significant difference was found between the groups in terms of the presence of scapular dyskinesis ($p > 0.05$).

Conclusions: Type 2 diabetes mellitus negatively affects upper extremity functionality through its impact on joint range of motion, muscle strength, and proprioception. Considering that shoulder problems may often progress silently without early symptoms, it may be beneficial to incorporate preventive rehabilitation programs that include strength training, joint range of motion exercises, proprioception training, and functional exercises. Such interventions may help mitigate the adverse effects of diabetes on upper extremity function.

A-0743 RESTORING FUNCTIONAL BALANCE THROUGH VIRTUAL HAND THERAPY: INSIGHTS FROM EIGHT DIVERSE CASES

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Introduction: Balanced hand function is traditionally viewed as the interplay between skeletal alignment, ligamentous integrity, muscular coordination, and neuromuscular control. However, functional outcomes can also be influenced by perceptual and central regulatory mechanisms. The emergence of virtual rehabilitation models offers a unique opportunity to isolate these variables.

Aim: To assess the efficacy of a Virtual Hand Clinic in achieving objective and subjective patient outcomes.

Material & Methods: A Virtual Hand Clinic model was implemented for eight patients with diverse conditions, ranging from nerve compression injuries and syndromes to hand fractures and trigger finger. Treatment incorporated physics-based rehabilitation strategies aimed at recalibrating sensory–motor coherence: targeted attention, frequency-based techniques, perceptual reframing, sensory–motor reorganisation strategies, and targeted modulation of energetic and bioelectrical patterns within the limb.

Results: All eight cases demonstrated functional improvement, including decreased pain, improved range of motion, enhanced dexterity, or reduction in neuropathic symptoms, despite the absence of mechanical input. This indicates that restoring balance within the sensory–motor and bioelectrical systems of the limb may be a key therapeutic driver.

Conclusions: Findings suggest that balance in hand function may extend beyond biomechanics to include bioelectrical coherence. This expands the definition of balance beyond structure alone. Virtual physics-based rehabilitation presents a novel framework for restoring functional balance and opens a new frontier for integrating physics-based medicine into upper-limb rehabilitation.

A-0744 A VALID OPTION STILL IN USE FOR CIRCUMFERENTIAL FINGER DEFECTS: INTERPOLATION FLAPS

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Introduction: Fingers are essential components of fine motor control, grip strength, and sensory feedback, and they play a critical role in maintaining overall hand balance. This balance refers to the coordinated interaction of tendinous, musculoskeletal, and neurovascular structures that ensures stable force distribution, precise movement, and functional harmony within the hand. Circumferential soft-tissue defects of the fingers disrupt not only local tissue integrity but also this delicate biomechanical equilibrium, posing significant challenges for functional restoration.

Although microsurgical free tissue transfers represent current reconstructive standards, interpolation flaps remain a valuable option in selected cases due to their reliable vascularity, technical feasibility, and ability to provide robust tissue that facilitates the preservation of hand balance. This study presents our clinical experience with interpolation flaps for circumferential finger defects, focusing on functional outcomes and their contribution to restoring balanced hand mechanics.

Materials and methods: Between May 2024 and May 2025, ten patients with circumferential finger defects were operated on using the interpolation flap technique in our clinic. The etiologies of the defects included replantation necrosis, crush injuries, post-burn tissue loss, and traumatic amputations. All patients were selected based on the defect location and size, vascular status of the finger, and general health conditions.

The flaps were designed according to defect size and elevated from the groin or paraumbilical region, based on the superficial inferior epigastric artery and vein. The pedicles were preserved during transfer to the defect site. Primary closure of the donor area was aimed for when possible; however, grafting was required in four cases. Postoperatively, patients were monitored for an average of 21 days (14–24 days), followed by an interval ischemia protocol and a second-stage division procedure. Patients were instructed regarding regular wound care, early identification of complications, and activity restrictions.

Results: All defects were successfully reconstructed with the applied flaps. No flap necrosis occurred. One patient developed an infection requiring surgical debridement. Hematoma/seroma formation occurred in one patient and was treated with drainage. Two patients experienced wound dehiscence, resulting in prolonged healing but resolving with conservative management. Maceration in the axillary region was observed in four patients; however, it did not lead to significant functional impairment or require additional intervention. The flaps demonstrated good adaptation to the defect sites and contributed positively to the preservation of finger function. Follow-up evaluations revealed satisfactory outcomes, particularly in grip strength and finger flexibility.

Discussion: Despite the prominence of free tissue transfer, interpolation flaps remain a practical and reliable option for circumferential finger defects, providing adequate tissue, dependable vascularity, and technical simplicity, though they require two stages and may leave donor-site scars. In our study, complication rates were comparable to the literature and no major flap loss occurred, underscoring the value of proper patient selection, meticulous technique, and close follow-up. The versatility of these flaps contributed to favorable functional outcomes. Overall, although microsurgical free flaps are the modern standard, interpolation flaps remain a relevant and effective choice, offering reliable, functional, and aesthetically acceptable results for circumferential finger reconstruction.

A-0745 TRAPEZIOMETACARPAL PROSTHESIS AND THUMB METACARPOPHALANGEAL JOINT FUSION: RESTORING BALANCE ALONG THE THUMB RAY

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Introduction: Restoring optimal thumb function relied on the delicate balance between trapeziometacarpal (TM) motion, metacarpophalangeal (MCP) stability, and overall thumb length. The MCP joint range of motion is variable across individuals, particularly in flexion.

Aim: A trapeziometacarpal (TM) prosthesis, by restoring thumb length, can correct pre-existing MCP hyperextension or prevent its progression. Conversely, MCP flexion could become limited due to individual anatomy or prosthesis positioning, generally without compromising overall thumb function when global balance is maintained.

Material & Methods: Dual-mobility TM prostheses allows an arc of motion between 114 and 118°, ensuring dynamic stability at the basal joint. Persistence or development of symptomatic MCP pathology (painful instability or osteoarthritis) after TM replacement could disrupt thumb-ray balance. In this context, MCP fusion re-established stability but raised concerns regarding mechanical constraints on the prosthesis. The method of fixation for MCP joint fusion is limited at times by the small available space due to the prosthetic stem.

We reported three cases of definitive MCP fusion performed after TM prosthesis implantation and evaluated their impact on thumb balance and function. The surgical indication was painful MCP osteoarthritis. A segmental MCP brace simulating definitive MCP fusion was worn for 6 weeks preoperatively to assess functional tolerance. The MCP bony fusion was adjusted to ensure full contact between the thumb and index pulps (functional positioning): after cartilage removal, the proximal phalanx was derotated, with the MCP placed in 30° flexion and compression applied between the two bones. Fixation was performed twice with a 2.0 locking plate and once with staples. The thumb was immobilized in a thumb plaster cast (Alpine splint-type) for three months, leaving the IP and trapeziometacarpal joints free for postoperative mobilization. **Results:** At three months, all MCP joints had fused. At a minimum of four years from MCP fusion and 60 months from TM arthroplasty, patients reported satisfactory functional use. All noted subjective thumb shortening. Kapandji opposition score was 10; thumb extension reached 25% of normal (Kapandji classification), and strength was restored. One plate breakage occurred, but MCP fusion remained solid with an asymptomatic valgus deformity. Importantly, no adverse effects were observed on the TM prosthesis (loosening, wear, dislocation, or overloading), and all patients remained pain-free at the TM joint.

Conclusions: Although limited in number, these cases suggested that MCP fusion could successfully restore thumb-ray balance and function in selected patients with combined MCP and TM osteoarthritis, without compromising the longevity of a TM prosthesis. Larger series are required to confirm these preliminary findings.

A-0746 COCOHERENCY TOOLS IN UPPER-LIMB REHABILITATION: SPECTROCHROME LASER & 111HZ TUNING FORK APPLICATIONS (THIS PROPOSAL IS FOR A 2 HOUR WORKSHOP)

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Introduction: Functional balance in the upper limb depends not only on biomechanics but also on bioelectrical coherence and sensory–motor organisation. This hands-on workshop introduces physics-based medicine as an adjunct to traditional rehabilitation. Biomedical engineer Kimberly Schipke, M.S., and specialist hand therapist Robyn Midgley will outline the

scientific principles underlying energetic balance, frequency-based modulation, and sensory–motor coherence. Participants will observe live demonstrations using coherency tools such as the Spectrochrome Laser and the 111 Hz tuning fork to assess and correct energetic imbalances. Hands-on practice will enable attendees to apply these interventions in real time and integrate them with established therapeutic approaches to support functional balance in complex upper-limb conditions. **Aim:** Physics-based medicine offers a novel framework for understanding balance in the upper limb beyond biomechanics alone. This hands-on workshop, delivered by biomedical engineer Kimberly Schipke, M.S. and specialist hand therapist Robyn Midgley, introduces the science underlying bioelectrical regulation, sensory–motor coherence, and energetic balance. Participants will learn how to assess subtle energetic imbalances in the hand and upper limb using non-invasive tools such as the Spectrochrome Laser and the 111 Hz tuning fork, and observe how coherency techniques can influence function, pain, and neuromuscular response. The session combines scientific explanation with live demonstrations and supervised practice to bridge physics-based concepts with clinical application. Attendees will gain new insights into restoring balance in complex cases where structural interventions alone are insufficient.

Material & Methods: This workshop introduces a physics-based, coherency-focused approach to clinical care, integrating the expertise of Kimberly Schipke, M.S., a biomedical engineer and thermographer known for developing the Spectrochrome Laser, and Robyn Midgley, a specialist hand and upper limb therapist recognised for her work in advanced rehabilitation strategies. The session begins with an accessible overview of the science behind physics-based medicine, including concepts of energetic imbalance, coherence, frequency-based stimulation (with emphasis on 111 Hz), and how these influence tissue behaviour, pain perception, and hand function. Participants will then observe live demonstrations on assessing energetic disturbances using coherency tools and structured observation.

Hands-on practice will allow attendees to apply the Spectrochrome Laser and tuning fork techniques under guided supervision, learning how to identify imbalances, track immediate responses, and integrate these approaches into standard rehabilitation protocols. Clinical case examples—including neuropathies, stiffness, trauma, and pain syndromes—will illustrate where physics-based interventions can complement traditional therapy.

This workshop provides clinicians with a practical skillset for restoring functional balance through non-mechanical means, offering an innovative adjunct for complex or treatment-resistant presentations.

Results: This workshop provides clinicians with practical, physics-informed assessment and treatment skills that complement traditional biomechanical approaches, enabling them to address functional balance in complex or treatment-resistant upper-limb cases.

A-0747 CONGENITAL HAND ANOMALIES TREATMENT BY RESTORING NORMAL TENDON BALANCE AND NO PINNING. THE DIRECTED GROWTH EVIDENCE

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Introduction: The treatment of congenital hand anomalies has long relied on transposing adult orthopedic techniques to the child's hand. Mechanisms of these deformities, mostly due to tendon unbalance, were poorly understood. Surgical approach to cleft hands, thumb duplications and synpolydactylies have traditionally focused on immediate realignment using osteotomies and pinning, and addressed mobility deficits with invasive articular procedures. However, surgical results most often deteriorate over the long term and are finally very disappointing.

Observation of normal development and of congenital malformations show that the epiphyses produce longitudinal growth, while the tendons direct that growth.

Aim: Thirty-five years of observation have led us to propose a paradigm shift, which we call Directed Growth. Because malunions in children can correct themselves only through the balancing forces of normal tendons, we supposed that restoring normal tendon balance and correcting epiphyseal malformations would allow congenital deformities to remodel through subsequent growth without osteotomies. We trialed this new concept on a prospective follow up

Material & Methods: Thirty thumb MP duplications, thirty synpolydactylies and twenty five cleft hands have been treated by restoring a normal tendon balance and no pinning, prospectively with a follow up reaching 22 years (mean 5 years). This requires changing surgical approaches: favor tendon gliding so that tendons can exert their realigning dynamics, and avoid osteotomies and pinning.

Results: This marks a true disruption from radiograph-driven twentieth century techniques. The “No Pinning” strategy tolerates minor residual operative clinodactyly or camptodactyly, that can remodel further on by Directed Growth. The rate of surgical revision was important for skin contracture or tendon adhesion, to allow favorable tendon dynamics

Conclusions: These breakthrough principles have become an evidence-based surgery and were validated prospectively. We therefore propose a new approach to thumb duplications, cleft hands (including management of the transverse bars) and synpolydactylies, treated in two stages. A palmar approach is essential. Simply ask yourself: where are the tendons? where are the epiphyseal malformations? Restore a normal tendon balance by rerouting anomalous pathway, recreate pulley systems, and refrain from pinning. Mobilize immediately, Do not tolerate skin contractures which disturb the final result, and revise them as soon as necessary. Directed Growth will complete finger alignment. Follow these children until puberty with a critical, analytical eye and evaluate the accuracy of your predictions.

A-0749 TRANSLATION AND CROSS-CULTURAL ADAPTATION OF THE PATIENT EVALUATION MEASURE INTO HEBREW AND ARABIC

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Introduction: The Patient Evaluation Measure (PEM) is a patient reported outcome measure (PROM) focused on the hand that was developed in Derby, UK and first presented by Macey et al in 1995. It has since been used in clinical practice and research in the UK and throughout the world. Several studies have validated the questionnaire, showing it to be a reliable PROM applicable to a multitude of common hand conditions and sensitive enough to measure changes following treatment. Its simplicity is a major advantage with the main questionnaire consisting of only ten questions and an additional 8 questions available to assess patient experience and satisfaction when desired.

Whilst many Israeli citizens speak English in most cases it is not their primary language. Previous PEM validation studies have involved native English speakers and it is likely that the questionnaire will not accurately portray the views of patients who do not speak English as their primary language. The PEM has not previously been translated into Hebrew or Arabic, the two official languages of Israel.

Aim: We aimed to perform a translation and cross-cultural adaption of the PEM into Hebrew and Arabic and validate these translated, adapted versions of the questionnaire for clinical use.

Material & Methods: We followed a recognised and well described method of translation and cross-cultural validation using the following seven steps.

1. Translation of the PEM by two native speakers of the target language who are fluent in English. One translator with a professional medical background and the other with a different background.

2. Synthesis of the two translated renderings into a single translated version in the target language.
3. Back-translation of the synthesised translation into English by two native English speakers who are fluent in the target language. One translator with a professional medical background and the other with a different background.
4. Preparation of a pre-final version using an "expert committee" of the study investigators and a language expert. All translations reviewed and any discrepancies resolved.
5. Trial of pre-final version using volunteers fluent in the target language
6. Preparation of final version accounting for feedback received from volunteers in the previous stage.
7. Validation of final version using more volunteers fluent in the target language. The translated PEMs were validated for language and comprehension. Clinical application was not investigated.

Results: We successfully translated and adapted the PEM into both languages. Only minor changes were required to account for cross-cultural differences. Over 80 volunteers were used to validate the translations, showing them to be readily understandable to native Hebrew and Arabic speakers. During the course of the project we identified some areas of the original PEM that would benefit from improvement to increase its comprehension and performance. A future project will investigate these areas and aims to create and validate a modified PEM in all three languages.

A-0751 DEL SIGNORE INTERPOSITION ARTHROPLASTY IN BASAL JOINT ARTHRITIS. DOES COLLAPSE MEANS PAIN? RESULTS AT 5 YEARS OF FOLLOW UP

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Introduction: Basal joint arthritis is one of the most frequent degenerative diseases in hand. There has been described multiple surgical techniques for the disease: simple trapezium excision, interposition arthroplasty, trapeziometacarpal arthrodesis, and implant arthroplasty, with different outcomes.

Aim: We review the results of Del Signore interposition arthroplasty at 5 years follow up.

Material & Methods: Restrospective study of patients with basal joint arthritis treated surgically at Hospital de la Princesa with Del Signore technique, from 2012 to 2020: Trapezium excision plus tenodesis between hemitendon from abductor pollicis to flexor carpi radialis tendon. 64 patients, 57 women, mean age of 65 years (44-82). Eaton Littler clasification includes 16 patients in grade II, 13 patients in grade III and 35 patients in grade IV. Associated treatment at metacarpophalangeal joint was performed in 18 cases. Pain was assessed by means of a visual analog scale (VAS) at one month, 12 months and 5 years of follow up. Kapandji index for mobility, and Kadiyala index to asses the colapse of the trapezium space were also measured.

Results: VAS results showed 54 patients at 0 pain at one year of follow up. The other 10 patients were between 3 and 5 scores. The follow up at 5 years showed 50 patients at 0 pain. Kapandji index showed 62 patients at grade 10, at one and 5 years of follow up. Kadiyala index showed a progressive lost of trapezial space with time. Mean preoperative index was 0,41. The postoperative index was 0,25, and 0,18 at one year of follow up, and 0,14 at 5 years of follow up. Statistically there were no significative association between collapse and sex, age, side, or Eaton Littler classification. But we do found a relationship between collapse and pain.

Conclusions: Del Signore suspension arthroplasty is a simple and efficient surgical technique in basal joint arthritis, with a statistical significant reduction in pain, without the comorbidity asociated to obtaining tendon graft of other techniques, and a shorter surgery time.

There is a collapse of the trapezial space with time, without losing mobility of first finger, or increasing pain, except for the worst cases.

A-0753 INNERVATED PERFORATED ISLAND FLAP FOR SOFT TISSUE RECONSTRUCTION AFTER FINGER TUMORS

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Introduction: Soft tissue defects of the fingers commonly arise as a consequence of resection of tumors. Restoring a thin and pliable soft tissue envelope is critical to restoring mobility and optimizing functional outcomes. But also, its blood and sensitive support.

Aim: To defend the role of innervated vascular flaps for functional results after tumor excision.

Material & Methods: Finger hand tumors whose oncological resection created a neurovascular defect in the finger with bone or tendon exposure were collected. Its treatment consisted on providing coverage with reinnervation and perforated vascular supply. Follow-up, physiotherapy protocol, mobilization and final outcomes are registered.

Results: The homodigital island flap based on dorsal branches of the proper digital artery (PDA) is the selected method for repair of finger-pulp defects with sensitive recovery as we apportioned nerve transfer. The dorsal metacarpal artery perforator flap (Quaba flap), was the option for covering defects located in the volar area of the adjoining proximal fingers. Both flaps reach a full motion of an neurovascular recovery long fingers.

Conclusions: These flaps feature consistent vascular anatomy, minimal donor site morbidity, a good rotation arc, and a low complication rate, with the possibility of providing sensory innervation. They allow covering defects of moderate size, with an adequate quality of the tissue after radical finger tumors of the hand.

A-0754 HAMMERING DOWN INDICATIONS: ANALYSIS OF MALLET FRACTURES

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Introduction: Mallet finger fractures are characterized by an avulsion fragment of the distal phalanx at the insertion of the extensor tendon. This results in a 'drop' or 'hammer' finger with an inability for active extension. Conservative treatment consists of splinting the finger for a minimum of six weeks. Guidelines indicate surgical extension block pinning with Kirschner wires for mallet fractures with subluxation or large fragment sizes. Literature is inconclusive about the optimal treatment for mallet fractures. This study aimed to contribute to this knowledge gap and gain insight into outcomes in local practice.

Aim: This study aimed to contribute to the existing literature and provide insight into local treatment outcomes for mallet finger fractures. We hypothesized that surgical treatment would result in a comparable extension lag compared to conservative treatment, with potential differences in secondary outcomes such as a higher complication rate in the operative group.

Material & Methods: A retrospective cohort analysis was performed to compare conservative and surgical treatment. Adult patients with a closed mallet fracture between 2019 and 2023 were eligible. The primary outcome was distal interphalangeal joint (DIP) extension lag, secondary outcomes were DIP flexion and complications. Avulsion fragment sizes were measured on lateral X-rays. Data was extracted from patient records and statistically tested.

Results: In total, 117 patients were analysed of whom 86 patients received conservative treatment and 31 surgical treatments. Median DIP extension lag was 5° in the conservative group versus 4° in the surgical group ($p=0.82$). No correlation was found for the avulsion fragment size in the conservative or surgical group ($p=0.74$, $p=0.05$). The complication rate was 14% in the conservative group compared to 34% in the operative group ($p=0.001$).

Conclusions: Results show no difference in extension lag, regardless of fragment size. The surgical group had more complications. Therefore, this study showed the need for re-evaluating indications for surgical treatment of mallet fractures.

A-0755 THE POTENTIAL ROLE OF OLFACTORY STEM CELLS IN PERIPHERAL NERVE REGENERATION – A LITERATURE REVIEW

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Introduction: Peripheral nerve injuries are common and often lead to long-term disability. Despite advances in microsurgical techniques, functional outcomes after nerve-gap repair remain limited, with fewer than half of patients regaining protective sensation or meaningful motor function. Regenerative medicine offers a promising avenue to enhance peripheral nerve regeneration.

Olfactory ecto-mesenchymal stem cells (OEMSCs), derived from the olfactory mucosa—an accessible and minimally invasive source of neural derived stem cells—exhibit both neural and mesenchymal characteristics. OEMSCs have emerged as an ideal candidate for peripheral nerve repair. We hypothesized that, given their shared developmental origin with peripheral nerves (neural crest-derived), OEMSCs may represent an optimal cell source for promoting peripheral nerve regeneration); With the growing interest in cell-free regenerative strategies, we also reviewed the potential of extracellular vesicles (EVs) derived from OEMSCs as an alternative therapeutic approach.

Aim: We conducted a literature review to delineate the effects of OEMSCs on peripheral nerve regeneration and to assess the therapeutic relevance of their extracellular vesicles as a potential cell-free substitute.

Materials and Methods: A systematic review of the literature identified ten preclinical in vivo studies conducted in rats, evaluating injuries of the facial, sciatic, and peroneal nerves. One additional preclinical study assessed the effects of OEMSC-derived EVs in a peroneal nerve defect model. Ten complementary in vitro studies were analyzed to explore the intrinsic biological mechanisms that may account for the regenerative capacity of OEMSCs.

Results: OEMSCs exhibit both neural and mesenchymal stem cell characteristics, and the olfactory mucosa is the only known source of neural stem cells obtainable under local anesthesia in humans, making them an ideal candidate for clinical translation. Across in vivo studies, behavioral and electrophysiological assessments consistently demonstrated enhanced motor recovery and improved functional outcomes in animals treated with OEMSCs. OEMSC therapy also increased axonal sprouting and elongation, with particularly strong regenerative effects observed in delayed repair models. In addition, treated nerves contained a greater number of myelinated fibers with thicker myelin sheaths, indicating improved remyelination. Clinical-grade protocols for OEMSC expansion and manufacturing have now been established, supporting their potential for translational application. Furthermore, extracellular vesicles derived from human OEMSCs showed excellent immune tolerance in rat models and reproduced many of the parent cells' regenerative effects. Both fresh and cryopreserved EVs yielded strong outcomes in a peroneal nerve defect model, in some instances surpassing the autograft gold standard. Finally, their demonstrated cross-species tolerance suggests robust immune compatibility, supporting the feasibility of off-the-shelf allogeneic human EV-based therapies.

Conclusion: OEMSCs significantly enhance axonal regeneration, promote myelination, improve functional recovery, and modulate the neuroimmune microenvironment in preclinical peripheral nerve injury models. Their effectiveness in delayed repair scenarios underscores their clinical relevance.

Emerging evidence highlights OEMSC-derived EVs as a promising next-generation, cell-free therapeutic strategy, offering scalability, safety, and substantial regenerative potential. Further translational and clinical investigation is warranted.

A-0756 EFFECT OF CERVICAL RADICULOPATHY SIGNS ON PAIN AND FUNCTION AFTER PERIPHERAL NERVE DECOMPRESSION: A PILOT STUDY

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Introduction: Peripheral nerve compression syndromes such as carpal and cubital tunnel syndrome can cause persistent pain and functional impairment even after surgical decompression. Cervical radiculopathy may coexist with these conditions and potentially influence postoperative recovery. The Spurling test is a commonly used clinical tool to detect cervical nerve root irritation, yet its impact on postoperative pain and functional outcomes following distal nerve decompression has not been clearly defined.

Aim: The aim of this pilot study was to evaluate whether Spurling test positivity, as a clinical indicator of cervical radiculopathy, is associated with postoperative pain intensity and functional outcomes in patients undergoing carpal or cubital tunnel release surgery.

Material & Methods: Patients who underwent carpal or cubital tunnel decompression were evaluated postoperatively. The Spurling test was performed to assess the presence of cervical radiculopathy and recorded as positive (1) or negative (0). Functional outcomes were assessed with the Quick DASH, and pain levels were evaluated using VAS at rest, during activity, and at night.

Initially, descriptive comparisons were made between Spurling-positive and Spurling-negative groups. Then, to determine the independent effect of Spurling positivity, multivariable linear regression analyses were conducted, adjusting for age, type of surgery, and symptom duration.

A significance level of $p < 0.05$ was considered statistically meaningful.

Results: A total of 46 patients were included in the study (carpal tunnel syndrome: $n=39$, cubital tunnel syndrome: $n=5$, combined surgery: $n=2$). The mean age of the participants was 56.8 ± 10.4 years (range: 36–77). The Spurling test was positive in 31 patients and negative in 15. Mean pain scores were 1.83 ± 2.97 for VAS at rest, 3.28 ± 3.29 for VAS during activity, and 2.41 ± 3.25 for VAS at night. The mean Quick DASH score was 28.0 ± 9.7 , and the mean symptom duration was 5.7 ± 5.8 years.

After adjusting for age, type of surgery, and symptom duration, patients with a positive Spurling test had Quick DASH scores approximately 9.1 points higher ($\beta = 9.1$; 95% CI: 2.5–15.8; $p = 0.009$) compared with Spurling-negative patients. Pain during activity (VAS activity) was also significantly higher in the Spurling-positive group ($\beta = 1.3$; 95% CI: 0.3–2.2; $p = 0.018$). However, VAS at rest and VAS at night did not differ significantly between the groups ($p > 0.05$).

Conclusions: Spurling test positivity, indicating possible cervical radiculopathy, is associated with greater postoperative functional limitation and increased activity-related pain in patients undergoing carpal or cubital tunnel surgery. These findings highlight the importance of evaluating proximal cervical contributions in patients with distal nerve entrapments and suggest that preoperative cervical assessment may help improve postoperative outcomes.

A-0757 MULTICENTER ANALYSIS OF TREATMENT PATTERNS FOR THUMB CARPOMETACARPAL OSTEOARTHRITIS IN THE NETHERLANDS

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Background: In osteoarthritis (OA) of the thumb carpometacarpal (CMC-1) joint, the balance between mobility and stability is disrupted, resulting in pain and impaired thumb function. Treatment strategies aim to restore this balance through a wide range of nonsurgical and surgical interventions targeting joint stability, motion, and pain relief. While survey-based studies have provided insight into surgeons' treatment preferences, it remains unclear how patients are managed in routine clinical practice. The objective of this study was to provide the first large-scale overview of treatment patterns for CMC-1 OA.

Methods: We conducted a retrospective multicenter observational study of patients with CMC-1 OA diagnosed between October 2021 and February 2025 across 27 specialized hand surgery and therapy clinics in the Netherlands. Treatment trajectories were mapped to evaluate primary and subsequent treatments, with secondary surgical management defined as either conversion to surgery following primary nonsurgical treatment or reoperation after primary surgery. Subgroup analyses were performed for the five largest centers and for patients receiving surgical versus nonsurgical primary treatment.

Results: Of the 3,950 CMC-1 OA cases, 95.5% received nonsurgical primary treatment, mostly hand therapy with orthosis (84.1%). Despite guideline recommendations, 4.5% underwent primary surgery, more often in case of severe symptoms or physically demanding work. Primary surgery rates varied across centers (4–18%) and surgeons (0.7–16.1%). Reoperations after primary surgery were infrequent (2.8%) and typically occurred after the first year (median: 12 months). Among nonsurgically treated patients, 3.8% converted to surgery, usually within the first year (median: 7 months). Across the five largest centers treatment trajectories and conversion rates differed.

Conclusions: This multicenter study reveals that the management of CMC-1 OA involves a wide range of treatment options, yet is primarily predominantly nonsurgical in accordance with current national guidelines. Importantly, most patients are treated with a single intervention, underscoring the effectiveness of non-surgical management as the primary treatment strategy. However, despite generally high adherence, variation across centers and surgeons highlights the need for more consistent guideline implementation. Overall, this study supports better alignment of patient expectations and contributes to optimizing routine care pathways.

A-0758 CLINICAL APPLICATION OF NOVEL ABSORBABLE MAGNESIUM CANNULATED COMPRESSION SCREW IN METACARPAL FRACTURES: FIRST EXPERIENCES (CANAMGCCSFIX)

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Introduction: Intramedullary fixation (IMF) with cannulated compression screws (CCS) is routinely used for short-oblique or transverse metacarpal fractures. Although overall complication rates are low, reoperation for refracture, infection, or symptomatic hardware remains challenging. Bioresorbable magnesium (Mg) alloy screws were introduced to overcome the need for implant removal. Earlier generations corroded rapidly with hydrogen gas accumulation and peri-implant osteolysis. Newer designs aim to slow degradation to balance degradation and gas formation with resorption. In our recent biomechanical testing of the mm.CS screw system (KLS Martin, Germany), their mechanical safety for intraoperative

application (IMF of metacarpal fractures) could be shown. Clinical evidence for mm.CS use in the upper extremity remains limited.

Aim: To report clinical outcomes, complications and reoperations after intramedullary fixation of metacarpal fractures using bioresorbable mm.CS screws.

Material & Methods: We performed a retrospective cohort study including 9 consecutive patients with metacarpal fractures treated between 2024 and 2025 using the bioresorbable mm.CS (KLS Martin, Germany). Patient characteristics, operative details and functional outcomes were abstracted from the patient records.

Outcomes included radiographic and clinical time to union, total active motion (TAM), grip strength, complications and revisions. A standardized retrograde intramedullary technique under fluoroscopic guidance was used.

Results: Nine patients (10 metacarpals) were included with a mean follow-up of 6 months. The predominant trauma mechanism was a fist punch. A 3.5mm mm.CS was used in all cases, the length ranged between 36 and 40mm, with a mean surgery time of 24.4 minutes. Total active motion (TAM) of the affected finger improved from $223.8 \pm 22.2^\circ$ at 6 weeks postoperatively to $255.0 \pm 10.5^\circ$ at 3 months postoperatively, all patients achieved full fist closure after 6 weeks. Grip strength on the operated side was about 8% lower than the contralateral side at 6 weeks and equalized by 3 months. Mean time to clinical and radiographic union was 6 weeks. Mild peri-implant radiolucency consistent with gas accumulation was seen in all cases. One screw cut out at the metacarpal head occurred, most likely due to subprime operation technique. The patient was asymptomatic and refused revision surgery. No other intraoperative or postoperative complications were observed.

Conclusions: Biodegradable cannulated compression screws for intramedullary fixation in metacarpal fractures show promising early results both in intraoperative handling and postoperative outcome.

A-0759 ADVANTAGES OF ARTHROSCOPIC-ASSISTED FIXATION OF CARPAL BONE FRACTURES

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Introduction: The management of joint injuries that affect the carpal bones is complex if we seek an anatomical reduction and minimal soft tissue invasion. With advancements in surgical instrumentation and techniques, the role of arthroscopic and arthroscopic-assisted surgical procedures is ever-growing.

Aim: To defend arthroscopic reduction and fixation of articular carpal bone complex fractures.

Material & Methods: Displaced fractures of hamate, triquetrum, trapezium, lunate and scaphoid were recorded to be fixed percutaneously after arthroscopic-assisted reduction. CT scan was completed before surgery to plan to procedure. The technique was supported by fluoroscopy. Vertical traction and dry arthroscopy helped to reduce. Additional intra-articular injuries were reviewed and repaired if necessary.

Results: We included 35 patients with intra-articular displaced carpal bone fractures, 22 scaphoid fractures, surgery in the last 3 years. Tourniquet time reduced to 44 minutes and scope control to 2 min on average during surgeries. No immobilization time apart from soft bandage, except in case of SLL adjuvant injury repair. No cases of secondary displacement although they moved from the beginning. Measurements of key pinch was 73% and grip strength 85% of the contralateral side. Signs of bone healing were detected in 3.2 months. No others complications were found. 100% cases returned to work in less than 4 months.

Conclusions: Arthroscopic technique offers direct, magnified visualization of fracture and reductions and is more accurate than relying on intraoperative fluoroscopy. It diminishes soft tissue stripping of fracture fragments and injury to the

ligamentous complex, which is important for stability. And it also helps to ensure that percutaneous screw fixation does not penetrate the joint surface and also allows for debridement of any posttraumatic loose bodies or cartilaginous flaps.

A-0760 THE HIDDEN DISRUPTOR OF UPPER-EXTREMITY BALANCE: CLINICAL PITFALLS OF CONGENITAL ABSENCE OF THE FIFTH-DIGIT FDS TENDON

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Introduction: Balanced interaction between the flexor–extensor apparatus and intrinsic musculature is essential for maintaining functional integrity of the upper extremity. The flexor digitorum superficialis (FDS) is a central component of this system, and the congenital absence of its fifth-digit slip is a well-described anatomical variation. Although typically asymptomatic in daily activities, absence of the FDS-5 tendon can imitate a partial flexor tendon laceration following trauma, potentially leading to diagnostic errors. Awareness of this variation is therefore important during the evaluation of flexor zone V injuries.

Aim: This study presents five patients in whom limited proximal interphalangeal (PIP) flexion of the small finger initially suggested a partial FDS-5 laceration, while surgical exploration ultimately revealed congenital absence of the tendon. The aim is to illustrate how this anatomical variation may mislead trauma assessment and influence clinical interpretation.

Materials & Methods: A retrospective review was conducted of five patients who presented with flexor zone V injuries between January 2024 and August 2025, caused by knife or glass lacerations. All patients exhibited restricted PIP flexion of the small finger, raising suspicion of partial FDS-5 disruption. In several cases, additional neurological findings suggested possible median or ulnar nerve involvement. Definitive diagnosis in all cases was established through surgical exploration.

Results: Case 1: A 48-year-old female sustained a glass-related laceration to the left volar wrist. Examination revealed limited PIP flexion of the small finger accompanied by sensory deficits in the median and ulnar nerve territories. Exploration identified a 90% median nerve laceration, a 50% ulnar nerve injury, complete ulnar artery transection, and partial FCU rupture. The FDS-5 tendon was rudimentary, consistent with congenital absence. Neural and vascular repairs were performed.

Case 2: A 35-year-old male presented with a knife laceration to the right volar wrist and limited small-finger PIP flexion. Exploration demonstrated complete congenital absence of the FDS-5 tendon. Soft-tissue repairs were carried out as indicated.

Case 3: A 42-year-old female presented with a left-sided knife laceration, ulnar nerve symptoms, and reduced PIP flexion of the small finger. Surgical exploration confirmed absence of the FDS-5 tendon. The ulnar nerve and associated injured structures were repaired.

Case 4: A 33-year-old male with a knife laceration exhibited restricted PIP flexion of the small finger. Intraoperative assessment revealed a hypoplastic, nonfunctional FDS-5 slip rather than a traumatic tendon injury. Additional damaged structures were repaired as required.

Case 5: A 30-year-old female sustained a glass laceration to the right wrist, presenting with isolated limitation of small-finger PIP flexion. Exploration identified a thin connective-tissue remnant instead of a functional FDS-5 tendon. Remaining structures were repaired to maintain flexor mechanism balance.

Across all five patients, congenital absence or marked hypoplasia of the FDS-5 tendon produced examination findings highly suggestive of partial tendon injury. This series underscores the diagnostic challenges associated with this anatomical variant and highlights the importance of considering FDS-5 absence when evaluating upper-extremity trauma.

A-0761 3D-PLANNED PATIENT-SPECIFIC OSTEOTOMIES FOR INTRAARTICULAR MALUNION OF FINGER FRACTURES. RADIOLOGICAL AND CLINICAL OUTCOMES

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Introduction: Intraarticular malunions of the finger joints (MCP, PIP, DIP) may result in pain, reduced grip strength, and rotational or radioulnar deviation. Traditional free-hand corrective osteotomies rely on visual estimation and are technically demanding, especially for multiplanar deformities or articular steps. Three-dimensional (3D) planning with patient-specific instrumentation (PSI) facilitates accurate transfer of the digital plan to the operative field and has shown promising results in distal radius and phalangeal malunions.

Aim: The purpose of this study was to evaluate the feasibility, safety, and early clinical outcomes of 3D-planned, PSI-guided corrective osteotomies for malunions of intraarticular finger fractures.

Material & Methods: Fourteen patients with post-traumatic intra-articular malunions, three MCP metacarpals, eight PIP (seven proximal one distal phalange), three DIP (two middle and one distal phalange) who underwent 3D-planned PSI-guided corrective osteotomy between 2014 and 2025 were retrospectively reviewed. Preoperative planning was based on bilateral CT scans, mirrored contralateral anatomy was used to quantify deformities (deviation, articular steps) and plan the correction using CASPA software. Patient-specific cutting and reposition guides were 3D-printed. Outcomes were assessed clinically by evaluating range of motion (ROM), grip strength (measured with a Jamar dynamometer normalized to the contralateral hand), and patient satisfaction using the Single Assessment Numeric Evaluation (SANE) score. Radiologic accuracy analysis was based on radiographic imaging and postoperative CT imaging using 3D surface registration to quantify residual rotational and translational deviations as well as the intraarticular steps if available (three MCP metacarpals, three PIP proximal phalanges, two DIP middle phalanges).

Results: Mean age at surgery was 24 years (12 - 51 years), mean time from injury to surgery was 16 months (4 - 74 months). All operations were completed as planned without intra- or postoperative complications. Bone graft was used in one patient (osteochondral os hamatum graft). Quantitative assessment of correction accuracy (in depth radiologic data analysis pending) demonstrated close alignment between planned and achieved intraarticular alignment. At mean follow up of 12 months (4 - 24 months) the median active ROM improved in MCP from 88 (55 - 120°) to 103 (88 - 120°), in PIP from 37 (0 - 80°) to 50 (40 - 85°), in DIP from 48 (10 - 69°) to 56 (15 - 85°) postoperatively. Mean grip strength improved compared to the contralateral side from preoperatively -12% (-34% - +16%) to -8% (-15% - +30%). Radioulnar deviation or rotational deviation was present in 64% preoperatively and could be corrected in all cases. Implant removal was performed in 6 cases (43%). Patient reported satisfaction improved (results pending).

Conclusions: 3D-planned, PSI-guided corrective osteotomy for intra-articular finger malunions is a feasible and safe technique that enables precise restoration of joint congruency and bone alignment, with good functional outcomes. The workflow reliably transfers the virtual plan to surgery, offering high precision and reproducibility. It is a valuable tool for managing complex intra-articular finger malunions by achieving anatomical reconstruction and helping prevent long-term complications such as post-traumatic osteoarthritis

A-0762 BIOMECHANICAL ANALYSIS OF TORQUE APPLICATION IN NOVEL BIODEGRADABLE CANNULATED COMPRESSION SCREWS FOR METACARPAL FRACTURES

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Introduction: Intramedullary fixation (IMF) with cannulated compression screws (CCS) is an established treatment for metacarpal fractures, particularly if short-oblique and transverse. Although the procedure has a low complication rate, revision surgery for refracture, infection, or symptomatic hardware remains challenging. Bioabsorbable implants such as magnesium (Mg) alloys were developed to overcome the need for implant removal. Earlier designs degraded too rapidly, causing intraosseous hydrogen gas accumulation and osteolysis. Newer designs aim to slow corrosion to balance degradation, gas formation and resorption. Although thoroughly used in lower extremity surgery, indications in the upper extremity remain limited and insufficiently studied.

Aim: To evaluate the biomechanical stability of a newer generation Mg CCS, the mm.CS (KLS Martin, Germany), for IMF of metacarpal fractures.

Material & Methods: The study comprised two arms. First, maximum torsional stability of the mm.CS screws (diameters 2.8 mm and 3.5 mm; lengths 20–60 mm) was measured by advancing screws into polyurethane blocks (PU) to mechanical failure. Second, screws were retrogradely inserted into metacarpal bones of three cadaveric hands (12 metacarpals). Insertion torque was recorded at each half-turn. Safety margin was calculated by comparing peak insertion torque in cadaveric bone with torque at failure in polyurethane.

Results: Matched analysis between cadaveric peak insertion torque and PU torque of failure was performed for the screws in the cadaver trials (3.5×28, 3.5×32, 3.5×40, 3.5×60, 2.8×34 mm). Mean differences (PU–cadaver) were: 102.0, 81.0, 55.0, 59.9, and 76.3 N·cm, respectively, corresponding to cadaveric peaks of 20.3%, 16.9%, 36.3%, 21.1%, and 16.9% of torque at failure in PU tests. The mean difference (PU–cadaveric) was 74.9 N·cm (SD 18.7; 95% CI 51.7–98.0), implying a substantial intraoperative safety margin for these screws in IMF of metacarpal fractures.

Conclusions: The Mg cannulated compression screw has a comfortable biomechanical safety margin for intramedullary fixation of metacarpal fractures.

A-0763 ARTHROSCOPIC TREATMENT OF LUNATE NONUNION

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Introduction: The absence of healing in lunate bone is a rare complication of these low incidence fractures whose treatment has ignored or failed. The risk of bone necrosis, degenerative changes and carpal collapse force us to expedite the treatment.

Aim: To acknowledge this topic and to defend our clinical experience.

Material & Methods: We recorded the lunate nonunion cases in which reconstructive surgery was an option, MRI image of viable bone and no surrounding chondral damage. Three patients were included in this study. Arthroscopic-assisted technique was completed to debride, reduce, supply bone graft and fix the bone. We registered data of follow-up.

Results: After 1 year of follow-up, patients had reduced pain to VAS 2, they lost 23 degrees of range of motion and Quick-DASH score improved 81% compared to preoperative measures. One case associated a scapholunate ligament (SLL) repair, and another patient developed midcarpal osteoarthritis. All cases returned to work without significant limitations and adapted sport life.

Conclusions: Surgical procedure depends on the morphology of the nonunion in the lunate. Debridement and bone autograft supply is necessary to reach the healing. Fragment excision can be a good option when the fragment is small, preserving SL stability. Arthroscopic treatment allows early mobilization and preservation of soft tissues, which improves prognosis.

A-0764 RESTORING ELECTROMAGNETIC BALANCE IN THE HANDS: A BIOFIELD-INFORMED FRAMEWORK FOR UPPER-LIMB HEALING

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Introduction: Emerging research suggests that the human biofield—a complex, ultraweak electromagnetic system produced by cellular, ionic, photonic, and thermal activity—plays a significant role in physiological organization and sensory–motor regulation. For the hand, one of the body’s most densely innervated and behaviorally complex structures, disruptions in bioelectrical coherence may contribute to pain, dysesthesia, delayed healing, and impaired functional integration. With modern biophysical tools capable of measuring subtle electric, magnetic, and photonic activity around tissues, new clinical models are exploring how restoring electromagnetic balance may complement traditional surgical and rehabilitative approaches.

Aim: To investigate whether electromagnetic rebalancing of the hands can enhance healing and functional recovery.

Material & Methods: This summary integrates scientific research in bioelectromagnetics, mechanotransduction, biophoton activity, infrared thermography, and subtle-energy mapping with clinical observations from physics-based rehabilitation methods. Particular focus is given to hand-specific interventions using coherent green light (a frequency band associated with autonomic balancing and tissue-calming effects) and a 111 Hz weighted tuning fork, both applied to the upper extremities and the biofield. These modalities introduce coherent electromagnetic and vibratory input to regions rich in mechanoreceptors, nerve plexi, and microvascular networks.

Results: Early clinical observations indicate that applying coherent green light to the hands may promote local bioelectrical stabilization, reduce sympathetic overactivation, and support neurosensory recalibration. Similarly, 111 Hz vibratory input appears to enhance relaxation responses, modulate dysregulated sensory–motor loops, and improve subjective hand “coherence.” These hand-based interventions align with broader biophysical data showing that subtle electromagnetic fields from the heart, brain, and peripheral nerves extend into surrounding space, respond to coherent stimulation, and correlate with emotional and functional states.

Conclusions: Restoring balance to the biofield of the hands may represent a novel adjunctive pathway for reducing pain, improving neurosensory regulation, and enhancing functional outcomes following injury or surgery. Integrating coherent light and sound into postoperative or non-operative care may support recovery through physics-informed mechanisms that complement traditional anatomical and biomechanical approaches.

A-0765 REHABILITATION AND MANAGEMENT OF ELDERLY CIRCULAR SAW INJURIES: FINDINGS FROM A SINGLE-CENTER STUDY IN NORTH EAST , UK

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Introduction: DIY-related hand injuries among adults aged 65 and above are increasingly encountered in hand surgery units. These injuries often involve complex trauma and lead to significant functional impairment, making understanding their patterns and outcomes essential for improving prevention and management.

Aim: To analyse the patterns of DIY-related hand injuries in individuals aged 65 or older, evaluate the surgical interventions performed, and assess functional and social outcomes to guide future prevention strategies.

Material & Methods: A prospective observational study was conducted at County Durham and Darlington University Hospital from July 2017 to January 2022. Patients aged ≥ 65 presenting with DIY-related hand injuries were included. Data collected comprised injury type, operative management, and follow-up details. Functional recovery was assessed using the QuickDASH score, and social independence was evaluated at final review.

Results: Nineteen patients (aged 66–94; mean 72) were identified. Injuries included 15 digit amputations, two flexor tendon divisions, one thumb degloving injury, and one open comminuted metacarpal fracture. Eight of the 15 amputations were successfully replanted or revascularised; the remaining digits were terminalised, with two requiring local flap reconstruction and one bone grafting. Rehabilitation averaged 10 months for replantations and 5 months for tendon repairs. QuickDASH scores demonstrated functional improvement, with MCID values ranging from 7.8 to 56.8. At final follow-up, 16 patients were fully independent, two were partially dependent, and one required full social care.

Conclusions: DIY-related hand injuries in older adults frequently result in severe trauma requiring complex surgical management and prolonged rehabilitation. These injuries have substantial implications for functional independence and quality of life. Targeted education, safety awareness, and preventive strategies are essential to reduce injury incidence and the associated burden on patients and healthcare services.

A-0766 PHALANGEAL AVULSION FRACTURE FIXATION USE THE HOOK PLATE: OUR OUTCOMES AND A TECHNICAL GUIDE

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Introduction: Avulsion fractures involving the terminal extensor tendon, flexor digitorum profundus (FDP), volar plate, or collateral ligaments present unique challenges in achieving stable fixation while preserving joint mobility. Conventional fixation methods can be limited by fragment size, soft-tissue tension, or difficulty achieving reliable purchase. The hook plate offers a versatile solution capable of securing small avulsion fragments across multiple anatomical sites.

Aim: This study presents our case series evaluating clinical outcomes following hook-plate fixation for phalangeal avulsion injuries and provides a detailed technical guide for plate preparation and application across different indications.

Material & Methods: We retrospectively reviewed 51 patients treated at our institution with hook-plate fixation for phalangeal avulsion injuries. Indications included terminal extensor tendon avulsions, FDP avulsion injuries, volar plate avulsion fractures, and collateral ligament avulsion injuries. All procedures were performed using a modified low-profile plate fashioned into a hook construct tailored to the fracture morphology. Postoperative rehabilitation protocols were

individualized based on injury pattern and fixation stability, with early controlled motion encouraged when appropriate. Patients were assessed for range of motion, pain, complications, and return to function. Minimum follow-up was 12 months, with an average follow-up duration of 18 months.

Results: Hook-plate fixation was successfully applied to all indications. Stable fixation allowed early mobilization in the majority of cases. At final follow-up, patients demonstrated good functional outcomes with very good range of motion across all treated joints. Union was achieved in all cases with only a single case of proximal tendon migration which required further procedure. Minor complications were limited to transient stiffness, resolving with hand therapy.

Conclusions: The hook plate is a reliable and versatile option for fixation of phalangeal avulsion fractures. In this case series, the technique demonstrated consistently good outcomes, high union rates, and excellent postoperative range of motion with minimal complications. Its adaptability and ability to securely capture small osteochondral fragments make it a valuable tool in the management of complex digital avulsion injuries. The included technical guide illustrates practical steps for fashioning and applying the hook plate, supporting broader adoption of this method in appropriately selected cases.

A-0767 THE CENTRAL PILLAR OF THE HAND: EVIDENCE OF THE BIOMECHANICAL AND CLINICAL SUPERIORITY OF THIRD-DIGIT REPLANTATIONS

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Introduction/Aim : The functional success of digital replantation relies not only on survival but also on restoring overall hand balance, axial stability, and coordinated grip patterns. The third digit (D3) functions as the central biomechanical column of the hand. This study aimed to compare the survival outcomes of D3 Zone I–II replantations with adjacent digits (D2 and D4) in a single-center cohort and to contextualize these findings using large clinical series reported in the literature.

Material & Methods: A retrospective review was performed of 32 digital replantations involving D2–D4 over an 18-month period. Injury distribution was as follows: D2 (n=11; Zone I=5, Zone II=6), D3 (n=12; Zone I=6, Zone II=6), and D4 (n=9; Zone I=5, Zone II=4). The primary outcome was survival at final follow-up. Data were summarized using basic descriptive statistics. Observed survival patterns were descriptively compared with ranges reported in large replantation series by Tamai, Urbaniak, Adani, and others.

Results: For D3, survival was 66.7% in Zone I (4/6) and 50.0% in Zone II (3/6), with an overall rate of 58.3% (7/12).

For D2, survival was 60.0% in Zone I (3/5), 33.3% in Zone II (2/6), and 45.5% overall (5/11).

For D4, survival was 60.0% in Zone I (3/5), 50.0% in Zone II (2/4), and 55.6% overall (5/9).

D3 demonstrated the highest overall survival, despite globally lower Zone II outcomes compared with standard literature. The pattern aligns with previously described anatomical and biomechanical advantages of D3.

Conclusions: D3 acts as the biomechanical keystone of the hand. In this cohort, D3 replantations showed the most favorable survival profile across both zones. Prioritizing D3 salvage may be essential for restoring postoperative hand stability and functional symmetry

A-0768 REFRAINING FROM CLOSED REDUCTION OF DISPLACED DISTAL RADIUS FRACTURES IN THE EMERGENCY DEPARTMENT (RECORDED TRIAL)

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Introduction: Distal radius fractures are among the most common fractures in the emergency department. Closed reduction is routinely performed in displaced fractures awaiting surgery.

Aim: The aim of this study is to determine whether closed reduction can be safely abandoned in these patients to prevent unnecessary pain and time waste.

Material & Methods: In this multicenter RCT, adults (18–75 years) with displaced distal radius fractures requiring surgery were randomized to closed reduction with casting or casting alone. Pain was assessed daily with VAS until surgery. Secondary outcomes included surgical duration, PRWHE scores during follow-up, grip strength and complications.

Results: 134 patients were included. No significant difference in VAS pain scores was found in the first postoperative week. Surgery duration was similar between groups. a trend of higher opioid use was seen in the reductoin group. At one year, there was no significant difference in PRWHE scores and complication rates.

Conclusions: Our findings suggest that closed reduction may be safely omitted in patients with displaced distal radius fractures awaiting surgery

A-0769 THE LEVEL OF EMOTIONAL BURNOUT AMONG RECONSTRUCTIVE ORTHOPEDIC SURGEONS DURING WARTIME-RELATED CHANGES IN CLINICAL PRACTICE: THE UKRAINIAN EXPERIENCE

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Introduction: The full-scale war in Ukraine has significantly altered the professional workload and the domestic, social, and working conditions of surgeons performing reconstructive procedures on the hand and limbs. Changes in patient demographics, increased work intensity, continuity of care, and sustained psychological pressure raise the risk of emotional burnout. Assessing this condition is essential for maintaining professional performance and mental well-being.

Aim: To evaluate the level of emotional burnout among reconstructive orthopedic surgeons working under wartime conditions and to compare outcomes between surgeons treating combat-related injuries and those working with civilian patients presenting with routine trauma and deformities.

Material & Methods: An anonymous survey of 37 surgeons was conducted: 21 involved in managing combat-related injuries and 16 working predominantly with civilian patients. The Copenhagen Burnout Inventory (direct Ukrainian translation) was used. Three domains were assessed: Personal Burnout (PB), Work-related Burnout (WB), and Client-related Burnout (CB). **Results:** Among surgeons treating military patients: PB: 53 (range 29–63; IQR 18), WB: 55 (25–71; IQR 22), CB: 35 (29–75; IQR 20). Among civilian surgeons: PB: 46 (29–63; IQR 12), WB: 50 (25–63; IQR 17), CB: 35 (25–75; IQR 20). Differences in PB and WB between the groups were statistically significant ($p < 0.05$).

Conclusions: Under wartime conditions, reconstructive surgeons demonstrate predominantly moderate levels of professional burnout. Work involving patients with combat-related injuries is associated with higher levels of emotional exhaustion and burnout.

A-0770 THE SEARCH FOR HARMONY AND BALANCE IN CARPAL TUNNEL SURGERY: CLINICAL ANALYSIS OF OPEN AND MINI-OPEN APPROACHES

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Introduction: Carpal tunnel syndrome is the most common entrapment neuropathy of the upper extremity, resulting from compression of the median nerve at the wrist. This study aimed to compare open and mini-open carpal tunnel release techniques in terms of clinical outcomes, functional recovery, and wound healing.

Materials and Methods: Forty patients who underwent surgery for carpal tunnel syndrome between 2023 and 2025 were retrospectively evaluated. The diagnosis was confirmed by clinical examination and electromyography. Patients were divided into two groups based on the surgical technique used: open surgery (n=20) and mini-open surgery (n=20). Postoperative pain (VAS), handgrip strength, time to functional recovery, wound healing, and complication rates were recorded during follow-up.

Findings: The mean age of the patients was 49.2 ± 9.8 years, and 65% were female. Postoperative pain relief was faster and wound healing was completed earlier in the mini-open surgery group ($p < 0.05$). Functional recovery was more pronounced in patients who underwent open surgery. Handgrip strength increased significantly in both groups. No significant difference was found between complication rates.

Conclusion: The findings of this study indicate that functional recovery was more pronounced in the open (long incision) surgical approach, while wound healing, early postoperative recovery, and patient comfort were more advantageous in the mini-open technique. While both methods are safe and effective, when choosing a surgical technique, the patient's functional expectations, healing, and wound closure priorities should be considered together, and a personalized surgical approach should be chosen accordingly.

A-0771 COMPARISON OF VOLAR PLATE AND KIRSCHNER WIRE FIXATION IN DISTAL RADIUS FRACTURES TREATED BETWEEN 2019 AND 2024

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Introduction: Distal radius fractures are among the most common upper-limb injuries and can significantly impair hand function. Selecting an appropriate treatment method is crucial for restoring wrist mobility and ensuring a rapid return to daily activity.

Aim: To compare functional outcomes after distal radius fracture stabilization using volar plate fixation versus Kirschner wire fixation.

Material & Methods: This retrospective cohort study included patients surgically treated at the hospital in Trzebnica between 2019 and 2024. A total of 280 patients were operated on, of whom 30% were male and 70% female. Twenty percent of fractures were stabilized with Kirschner wires, and 80% with a volar plate. Clinical data were collected from medical records and supplemented with physical examination and MAYO and PRWE questionnaires. Grip strength and wrist range of motion were assessed relative to the contralateral limb. Patients were divided into two groups according to the stabilization method.

Results: At a minimum one-year follow-up, no significant differences were observed in grip strength, range of motion,

MAYO score, or PRWE score between the volar plate and Kirschner wire groups. Both methods yielded similar functional outcomes when applied to appropriately selected patients and followed by structured rehabilitation.

Conclusions: Volar plate fixation and Kirschner wire fixation provide comparable functional results at one year. Both techniques are effective options for distal radius fracture stabilization when patient selection and postoperative rehabilitation are properly managed.

A-0772 RESTORING BALANCE IN HAND FUNCTION: LONG-TERM OUTCOMES IN PATIENTS UNDERGOING LUMBRICOPLASTY AND OPPONENSPLASTY

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Background: Lumbricoplasty and opponensplasty are established reconstructive procedures performed to restore intrinsic muscle balance, thumb opposition, and fine motor coordination in patients with nerve injuries or intrinsic muscle dysfunction. Despite their widespread use, long-term comparative outcomes remain limited in the literature.

Methods: Between June 2023 and June 2025, a total of 13 patients underwent tendon transfer–based reconstruction at our Plastic, Reconstructive and Aesthetic Surgery Department. Lumbricoplasty was performed in 8 patients and opponensplasty in 5 patients. The mean age was 32 years (range 20–48). All patients completed a 24-month follow-up. Functional assessments were conducted preoperatively and at 6, 12, and 24 months postoperatively, including grip and pinch strength measurements, Kapandji opposition score, intrinsic muscle function tests, range of motion, and DASH scores. A standardized rehabilitation protocol was applied to all patients.

Results: Both surgical groups demonstrated significant functional improvement after two years. Opponensplasty resulted in greater enhancement of fine motor skills, thumb opposition, and pinch strength (mean Kapandji increase: +5 points; pinch strength +42%). Lumbricoplasty yielded superior improvement in intrinsic muscle–dependent movements, particularly MCP joint flexion and IP joint extension control (grip strength +33%). DASH scores improved substantially in both groups, indicating better performance in daily activities. No major complications were observed.

Conclusion: Lumbricoplasty and opponensplasty are effective techniques that provide durable long-term functional gains. Opponensplasty offers superior outcomes in tasks requiring thumb opposition, precision, and pinch strength, whereas lumbricoplasty is more advantageous for restoring intrinsic muscle balance and coordinated MCP/IP joint motion. These findings support selecting the surgical technique according to the patient’s specific functional deficits.

A-0773 THE USE OF REGIONAL VASCULARIZED FLAPS IN DIGITAL RECONSTRUCTION. A SERIES OF 50 CASES

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Introduction: The use of local mini pedicled flaps have some advantages in comparison to free flaps for the reconstruction of soft tissue defects of the fingers.

Aim: The presentation and results analysis of the use of local pedicled flaps for covering soft tissue defects of the fingers.

Material & Methods: 50 men, median age 36(19-75), during the period 2017–2024 were treated surgically. 22 patients sustained traumatic distal phalanx thumb amputation, 7 patients with volar defects and 21 with dorsal defects of

index, middle or ring finger. 16 patients were treated with kite flap, 10 with reverse flow island intermetacarpal (second) artery flap, 19 with reverse cross finger flap and 5 with cross finger flap.

Results: The mean postoperative follow up lasted 8 months (6-12). Full healing and defect coverage. Active kinesiotherapy was achieved from the 4th postoperative week. 25 (64%) patients achieved full range of motion of the finger. 14 presented little or moderate residual stiffness.

Conclusions: The above mentioned mini flaps proved to be very effective for the covering of soft tissue defects. They provoke small stiffness and are safer in the surgical practice and follow up from the free flaps.

A-0774 UPPER QUADRANT STABILITY AND PAIN IN YOUNG MUSICIANS: A COMPARATIVE STUDY USING THE Y-BALANCE TEST AND FUNCTIONAL MOVEMENT SCORE

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Introduction: Musicians often experience musculoskeletal pain due to the repetitive and sustained postures required by their instruments. Stability in the upper quadrant is crucial for optimal performance. However, the relationship between upper quadrant stability and the prevalence of pain in musicians remains underexplored.

Aim: This study aims to investigate how upper quadrant stability correlates with pain levels in musicians, seeking to identify muscle imbalance contribution to musculoskeletal health and performance longevity in this population.

Material & Methods: Twenty six musicians (mean age 22.43 ± 1.54 years) and 22 non-musician (mean age 22.43 ± 1.54 years) youngsters participated in the study. The demographics of the participants were recorded. The upper extremity Y-balance test, which is currently the well known objective measure that assesses shoulder and trunk stability, was used to state upper quadrant stability. The Functional Movement Score (FMS) is a screening procedure designed to identify musculoskeletal dysfunction among individuals affected by pain. FMS is used to identify imbalances in mobility and stability in a set of seven fundamental movement patterns. The Visual Analogue Scale (VAS) was used to measure severity of pain affecting the daily life of musicians. Upper extremity Y-balance test results of musicians and non-musicians were compared to state musicians' upper quadrant stability. The relation of the Y balance test with other assessment results were analyzed with SPSS-25.

Results: Musicians Y balance test score (99.86 ± 8.08) was significantly higher than nonmusicians (86.63 ± 6.64) ($p < 0.01$). The average score of the Y-balance test was higher in string players (100.65 ± 8.4) than piano players (98.15 ± 7.86), however the difference was not statistically significant ($p < 0.05$). Pain intensity was higher in string players, however upper quadrant stability was also high. Pain was not correlated with upper extremity stability scores ($p > 0.05$). When the scores compared according to FMS score, Y balance score differed between groups ($p = 0.042$).

Conclusions: In the literature, deficiencies in postural stabilization systems have been reported in the development of musculoskeletal pain and performance related disorder in musicians, but the data analysis of our study revealed there may be other underlying causes of pain in musicians other than postural stabilization. Data results showed better balance in musicians compared to their non-musician peers, suggesting that playing an instrument against the force of gravity has an impact on balance and stability. The functional movement screen score was associated with variations in balance performance, indicating that musculoskeletal dysfunction exhibit different levels of balance as measured by the Y balance test.

A-0775 SYNTHETIC BONE GRAFT USE IN UPPER LIMB FRACTURE MANAGEMENT: A CASE SERIES

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Introduction: BonAlive (S53P4 bioactive glass) is frequently employed to facilitate bone regeneration and serves as one of many autologous grafting alternatives, each characterised by differing structural, osteoconductive and osteoinductive potentials. Upon implantation, Bonalive contains a silica-rich surface layer which functions as a template for calcium phosphate deposition, thereby promoting bonding with surrounding bone.

Aim: In this study, we evaluated patients who received BonAlive intraoperatively and assessed their postoperative course to determine the integrity of osseous repair and its impact on functional outcomes.

Materials and Methods: This was a retrospective single-surgeon, single-centre case series reported in accordance with STROBE guidelines and registered in the local hospital registry. This study included patients who underwent hand and distal forearm procedures for fractures of the upper limb between 2021 – 2025. Only patients who required the use of BonAlive intraoperatively were included. Data sources included operative logs and operative note entries kept on a local hospital database. Procedures were divided into six categories: Distal Radius Fracture (DRF) Open Reduction Internal Fixation (ORIF); Thumb ORIF; Little Finger ORIF; Middle Finger ORIF; Ring Finger ORIF; and adjunctive use for infection.

Data was collected by two independent authors, and analysed for patient demographics, type of procedure, time to surgery and the Quick Disability of Arm, Shoulder and Hand (DASH) score. Complications included incidence of malunion, non-union, surgical site infection (SSI), refracture, revision surgery, plate loosening and stiffness. Data extraction and analysis was performed using Microsoft Excel. Continuous data were reported as median with range. Dichotomous data were reported as numbers with percentages.

Results: A total of 30 patients were identified for a total of 31 procedures. Overall, there were 24 DRF ORIF (77.4%), 3 Little Finger ORIF (9.7%), 1 Thumb ORIF (3.2%), 1 Middle Finger ORIF (3.2%), 1 Ring Finger ORIF (3.2%) and 1 as an adjunct during debridement following an infection (3.2%). The median age was 44 years (range 20 – 86), and 55% were male (n=17/31). Two patients (n=2) required additional augmentation with an autograft. Two patients (6.5%) were identified as smokers. The median time to surgery was 10 days (range 2 – 38). Stiffness was reported in 42% of cases (n=13). Revision surgery was reported in two patients (6.5%). Malunion and SSI were reported in one patient in each category, respectively (3.2%). There were no cases of refracture, loosening or non-union. The median QuickDASH reported was 14.8 (range 0 – 54.5).

Conclusion: BonAlive use may have a role in reducing the incidence of non-union in patients managed operatively for hand and wrist fractures. Stiffness remains a common challenge with cases treated with BonAlive.

A-0776 STACK FINGER SPLINTS IN FRACTURES OF THE DISTAL PHALANX SHAFT MAY LEAD TO PALMAR APEX ANGULATION - A FOLLOW-UP EXAMINATION OF 25 PATIENTS TREATED AT A LEVEL I TRAUMA CENTER OVER THE PAST 10 YEARS

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Introduction: Distal phalanx fractures are a common injury to the hand. Despite of bony tendon avulsions, fractures of the distal phalanx can usually be treated conservatively. Various splints, casts, and functional bandages can be used for

the non-operative management. Due to its simplicity, the Stack finger splint is widely applied for several fracture types of the distal phalanx.

Aim: This study aimed to evaluate the clinical and radiological outcomes of patients with distal phalanx shaft fractures and to assess whether the Stack finger splint represents an appropriate treatment option. Furthermore, we investigated whether the radiographic findings at final follow-up correlate with the clinical outcomes.

Material and Methods: All patients treated for distal phalanx fractures at a Level I trauma center over a 10-year period were retrospectively reviewed. Among 171 identified shaft fractures, 25 patients underwent clinically and radiological follow-up examination. Clinical charts and radiographs were analyzed for trauma mechanism, fracture characteristics, treatment type, and outcomes.

Results: The cohort included 14 female and 10 male patients with a mean age of 43.7 ± 17.6 years. Twelve patients were treated with customized thermoplastic splints and 13 with Stack splints. Patients treated with Stack splints showed a statistically significant secondary dorsal displacement ($9.1 \pm 8.6^\circ$; $p = 0.006$), whereas those treated with customized thermoplastic splints showed an improvement in fracture angulation ($8.5 \pm 18.5^\circ$) compared to the first radiograph after trauma. Functional and patient reported outcome measurements were comparable between both groups, with a median DASH score of 3 [0.5–12.5] and MHQ score of 92 [80.5–98].

Conclusions: Stack splints appear unsuitable for the management of distal phalanx shaft fractures due to the risk of secondary displacement. Customized thermoplastic splints seem to preserve improved fracture alignment; however, differences in radiographic alignment did not translate into clinically relevant differences in function or patient reported outcome measurements.

A-0777 AI-BASED SHARED DECISION MAKING TOOL FOR THUMB BASE OSTEOARTHRITIS

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Introduction: Thumb base osteoarthritis (TBOA) is a prevalent condition, and treatment options range from conservative measures to a variety of surgical interventions. With implant survival rate being over 90% for first carpometacarpal joint replacement using modern implants, prosthetic arthroplasty is increasingly adopted, and the advantages of these over other surgical techniques are becoming well recognised. Trapeziectomy alone or combined with ligament reconstruction tendon interposition remains a standard surgical approach. Each modality offers a distinct balance of pain relief, stability, mobility, and recovery profile. Shared decision-making tools have been shown to enhance patient understanding and satisfaction, yet they remain underutilised within hand surgery. We have developed an online, AI-assisted decision aid to support patients with TBOA in exploring treatment options, understanding associated risks and benefits, and making choices aligned with their individual values and preferences.

Aim: To evaluate whether use of an AI-based decision aid improves patient knowledge, reduces decisional conflict, and enhances patient satisfaction and preference alignment regarding treatment options for individuals with TBOA.

Material & Methods: A systematic literature search (PubMed, 2020–2025) was undertaken to identify contemporary evidence comparing trapeziectomy with the two prosthetic implants licensed for use in the United Kingdom for TBOA with 28 studies reviewed. This evidence informed the development of an interactive, web-based decision aid (tja.lovable.app) incorporating AI-driven tailoring of information to patient preferences and priorities. Validation was conducted in two phases: (1) expert review by consultant hand surgeons and specialist hand therapists to establish content validity, and (2) usability testing and a pilot study involving patients diagnosed with TBOA. Participants complete the Decisional

Conflict Scale (DCS), System Usability Scale (SUS), and Decision Aid Acceptability Questionnaire (DAAQ) before and after using the tool to assess its impact on decision quality, usability, and acceptability.

Results: The AI-based decision aid has been successfully developed and is undergoing initial expert validation and usability testing. Preliminary clinician feedback indicates high face validity and strong perceived usefulness in structuring patient discussions. The forthcoming pilot study will evaluate its effectiveness in improving patient knowledge, reducing decisional conflict, and supporting informed decision-making regarding chosen management.

Conclusions: This study presents the first AI-assisted decision-making tool for TBOA. Its validation will provide insight into how digital tools can strengthen shared decision making in hand surgery, aligning treatment selection with patient values and enhancing informed consent and satisfaction with outcomes.

A-0780 CLINICAL OUTCOMES OF THE SIDE TO SIDE RUNNING SUTURE TECHNIQUE IN EXTENSOR INDICIS PROPRIUS TO EXTENSOR POLLICIS LONGUS TENDON TRANSFER AFTER EXTENSOR POLLICIS LONGUS RUPTURE

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Introduction: The extensor indicis proprius to extensor pollicis longus tendon transfer is one of the most successful operations for the reconstruction of extensor pollicis longus rupture. The side to side running crossing suture technique has been proven to be biomechanically superior in comparison with the Pulvertaft suture technique.

Aim: The aim of this study is the presentation of clinical experience of the use of the side to side running crossing suture technique in the extensor indicis proprius to extensor pollicis longus tendon transfer.

Material & Methods: During the period 2020 to 2022, 12 patients (7 men and 5 women), were treated from the same hand surgeon with the side to side running crossing suture technique in the extensor indicis proprius to extensor pollicis longus tendon transfer for extensor pollicis longus rupture. The rupture aetiology was internal fixation for distal radius fractures in 5 patients (41,7%), conservative treatment with cast in 4 patients (33,3%) and rheumatoid arthritis in 3 patients (25%). Postoperatively the cast was removed in 3 weeks, followed with kinesiotherapy.

Results: The mean age of the patients was 52 years old (48-79) and in 58.3% surgery concerned the dominant upper limb. The mean postoperative follow up was 1,5 year (6 months to 3 years). No rupture was noticed in any patient. The quick DASH score was high with mean $14,2 \pm 9,3$. All patients were satisfied from the result and returned to their former activity of daily living.

Conclusions: The results of this study prove that the use of the side to side running crossing suture technique in the extensor indicis proprius to extensor pollicis longus tendon transfer permits early mobilization and very satisfactory functional rehabilitation.

A-0781 ARTHROSCOPICALLY ASSISTED REFIXATION OF THE ULNOCARPAL DISC IN CASES OF DRUG INSTABILITY (ATZEI TYPES II AND III)

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Introduction: In addition to magnetic resonance imaging, arthroscopy is the gold standard in wrist diagnostics. The superiority of arthroscopy is demonstrated by the possibility of a differentiated view of the ulnocarpal disc, the exclusion

of accompanying injuries, and the possibility of treating injuries simultaneously and in a stage-appropriate manner. The Palmer classifications are used to distinguish between traumatic and degenerative injuries. The Atzei classification extends this to include ulnar-sided tears of the ulnar carpal disc and thus instabilities of the distal radioulnar joint (DRUG). Based on clinical experience, histological anatomical and biomechanical studies, the part that is important for stability is the insertion of the deep tethers of the radioulnar ligaments in the fovea ulnaris. Consequently, type II and type III lesions according to Atzei result in relevant instability of the DRUG. The technique and results of arthroscopically assisted refixation of the deep foveal ligament are presented and compared.

Aim: stabilisation of the distal radio ulnar joint

Material & Methods: Twenty-four patients with instability of the distal radioulnar joint and arthroscopically assisted fixation of the foveal ligament were retrospectively examined. Eighteen men and six women were involved. The median age was 42 years (range 15 to 58). Symptoms persisted for between 6 weeks and 6 years. The follow-up period was 36 months (range 3 to 36). All patients complained of ulnar-sided wrist pain and restricted pronation of the DRUG. All patients were diagnosed with avulsion of the insertion of the deep tethers of the radioulnar ligaments in the fovea ulnaris (Atzei II and III). Treatment consisted of arthroscopically assisted bony refixation of the ligaments in the fovea (ulnar fossa) using bone anchors. Follow-up treatment consisted of 3 weeks of immobilization with an upper arm splint, followed by a Bower's splint. Mobility, pain, usability, and Mayo wrist score were recorded.

Results: Almost all patients were very satisfied with the treatment outcome and were able to resume their original occupational activities. This is reflected in the results of this study. Grip strength and usability improved. Postoperative pronation/supination of the DRUG achieved equal range of motion (ROM) on both sides, and stability of the DRUG on the opposite side was achieved. Mayo wrist score results were excellent in 54%, good in 33%, satisfactory in 12.5%, and poor in 4% (range 30-100). The technique can also be used for combined injuries of the ulnocarpal disc.

Conclusions: Arthroscopically assisted bony refixation of the deep foveal ligament with bone anchors in cases of DRUG instability (Atzei types II and III) is a simple procedure for treating ulnar-sided disc tears, with good medium- and long-term results. Even delayed treatment was not associated with poorer outcomes.

A-0782 DISTAL PHALANX DEFECTS MANAGED USING THE 'SANDWICH' NPWT TECHNIQUE: DUAL-CONTEXT CLINICAL EXPERIENCE

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Introduction: Soft tissue defects of the distal phalanx remain a reconstructive challenge, particularly when bone or tendon exposure precludes primary closure. Flap reconstruction is effective but invasive and often unsuitable for small or contaminated wounds. Negative pressure wound therapy (NPWT) promotes angiogenesis and granulation, yet very little literature exists regarding its use in fingertip traumatic amputations and infections.

Aim: To demonstrate the feasibility and effectiveness of the NPWT "sandwich technique" in achieving soft-tissue coverage of distal phalanx defects in two distinct clinical contexts (infectious and traumatic) and to assess its potential to stimulate granulation over the exposed wound tissue.

Material & Methods: We portray two cases managed with NPWT "sandwich technique". A 47-year-old man with a volar felon and acute osteomyelitis of the distal phalanx of the left index finger and a 63-year-old man with a dorsal avulsion of the distal phalanx of the right thumb after a saw injury. Following serial local debridement and targeted antibiotics for

the infectious case and immediate NPWT initiation after trauma in the second case, NPWT systems were renewed weekly until complete epithelization. Photographic logs were obtained for each case. Full epithelization time was recorded. Active range of motion of the affected and contralateral fingers, digital length and functional score through Disabilities of Arm, Shoulder and Hand (DASH) were documented. All complications during the process were recorded.

Results: Both cases showed rapid granulation and wound contraction. It took on average 34 days (24 to 45 days) for the fingertip wounds to epithelize. In the infectious scenario we used NPWT as an adjunct therapy to serial wound debridement and were able to see granulation tissue developing directly over exposed bone, achieving full epithelialization without fingertip shortening at the cost of loss of volar padding. Minor adhesion and distal interphalangeal stiffness occurred but without functional limitation. No nail deformities were noted. The patient reported a DASH and work DASH score of 0. The patient with the traumatic dorsal avulsion of the thumb progressed with consistent granulation with NPWT for 24 days until full epithelization. Nail plate deformity developed and minor fingertip shortening of -0.25 cm was noted. This patient reported worse functional outcomes with a DASH score of 74 and work DASH of 81, however it must be taken in consideration that this patient had 3 amputated fingers on the contralateral hand from a previous work accident, severely affecting his daily activities.

Conclusions: These two cases illustrate the capacity of the NPWT “sandwich technique” to provide reliable coverage of distal phalanx defects across distinct clinical contexts. The occurrence of granulation directly over exposed cortical bone suggests that this configuration may create a biological environment beyond expected patterns. Both patients achieved stable, sensate coverage and preserved distal mobility without requiring flap surgery or bone shortening. Given the scarcity of reports on NPWT for fingertip traumatic amputations, this experience supports the “sandwich technique” as a practical, minimally invasive, and function-preserving conservative strategy for selected distal phalanx injuries, while highlighting the need for broader studies to validate these findings.

A-0783 DO PAEDIATRIC NAIL BED INJURIES NEED SUTURING?

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Introduction: 10,000 nail-bed repair operations are performed annually in the UK. Current preference is surgical repair rather than dressings. In young children this typically requires a general anaesthetic with inherent risks. Alternative treatment is to apply dressings, which is simpler and more cost effective. However, high-quality evidence comparing these approaches is lacking. We audited outcomes before and after a change in local policy favouring non-surgical management.

Aim: To evaluate the clinical outcomes of paediatric nail bed injuries managed with suturing versus dressings.

Material & Methods: All paediatric nail bed injuries referred to our department during the same four-month period in 2022 and 2023 were identified using the electronic health record system. Patient and injury demographics, treatment details, duration of follow-up, objective and subjective outcomes were recorded. Parental satisfaction with nail appearance was assessed via telephone at a minimum of 6-months follow-up.

Results: Ninety-eight digits in ninety-four patients were included. Overall, 55% were managed with dressings (41% in 2022 vs 65% in 2023). The mechanism of injury was a crush in 98% of cases. Prophylactic antibiotics were administered in 56% of patients. Only one infection was recorded, occurring in a sutured single-digit injury. There were no readmissions or reoperations. Parental assessment of nail appearance was rated 'good' or 'very good' in both groups (sutured 90% vs dressed 98%). The mean number of post-treatment hospital encounters was higher in the sutured group compared with the dressed group (2.19 vs 0.76).

Conclusions: In this single-centre experience, we found no difference in the outcomes and observed lower healthcare use in conservatively managed injuries. We propose a randomised controlled trial of dressing versus suturing for nail bed injuries in children.

A-0784 EFFECT OF EARLY CONTROLLED MOTION ON GRIP STRENGTH AND PROPRIOCEPTION AFTER ZONE II FLEXOR TENDON REPAIR: A RETROSPECTIVE CLINICAL STUDY

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Introduction / Aim: Zone II flexor tendon injuries remain one of the most challenging conditions in hand surgery due to the narrow fibro-osseous canal, the intimate relationship of the FDP and FDS tendons, and the high risk of adhesion formation. Advances in multi-strand tendon repair techniques have led to increased interest in early controlled mobilization, which has been shown to enhance tendon glide, decrease stiffness, and improve final digital motion. However, the relationship between early rehabilitation and recovery of proprioception, neuromuscular coordination, and global hand function has not been clearly defined. This study aimed to retrospectively evaluate the outcomes of patients treated with early controlled active mobilization after primary Zone II flexor tendon repair, focusing on grip strength, proprioceptive accuracy, tendon glide, and functional scores, and to compare findings with established rehabilitation principles

Material & Methods: retrospective review was performed on 38 patients who underwent primary repair of FDP $\pm$ FDS tendon injuries in Zone II between February 2023 and October 2025. All repairs were performed using 4- or 6-strand core suture techniques supplemented with an epitendinous running stitch. Patients with associated fractures, secondary reconstructions, tendon grafting, re-rupture, or peripheral neuropathy were excluded.

Postoperative rehabilitation followed a standardized modified Duran–Kleinert hybrid protocol, including passive flexion–active extension exercises from day 1, place-and-hold flexion beginning at week 2, controlled active digital flexion by week 3, and progressive strengthening from week 8 onward.

Outcomes were assessed through QuickDASH scores, grip strength measured with a Jamar dynamometer, proprioception testing based on joint-position sense error (in degrees), tendon glide ratio, pain levels using the VAS scale, and complication rates. Mean follow-up was 12–18 months.

Results: Patients demonstrated significant functional improvement after early controlled active motion. QuickDASH scores improved by 41% from baseline ($p < 0.01$). Final grip strength reached 82% of the contralateral side. Proprioception improved markedly, with joint-position sense error decreasing from 4.1° to 1.3° ($p < 0.01$). Tendon glide ratio averaged $73\% \pm 9\%$, while pain scores decreased from 6.1 to 2.4 within three months.

Complication rates were low: two patients (5%) required tenolysis due to adhesions, and no tendon ruptures were observed. Adhesion formation demonstrated a moderate negative correlation with both grip strength and proprioceptive accuracy. Patients with higher tendon-glide recovery showed superior neuromuscular balance and smoother digital motion patterns. **Conclusion:** Early controlled active mobilization following Zone II flexor tendon repair leads to meaningful improvements in grip strength, proprioception, tendon glide, and overall functional performance. Recovery of neuromuscular balance appears closely linked to restoration of tendon mobility and early sensory reactivation. The findings support early controlled motion protocols as a safe and effective strategy in modern flexor tendon rehabilitation, without increasing the risk of rupture. These results reinforce the importance of structured rehabilitation and targeted proprioceptive training in optimizing long-term outcomes after flexor tendon repair.

A-0785 SURGICAL TREATMENT OF PROXIMAL RADIOULNAR SYNOSTOSIS USING A PEDICLED EXTENDED LATERAL ARM FLAP

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Introduction: Proximal radioulnar synostosis is a relatively rare post-traumatic or congenital pathology which can lead to partially or complete movement impairment. Over the years a considerable number of surgical procedures have been proposed. However, it remains elusive which treatment should be the gold standard. Literature shows that resection only is associated with high risk for recurrence. In view of the slight variations in pathophysiology the most widely employed technique for congenital cases is derotational osteotomy. In contrast, for post-traumatic cases it is surgical excision of the synostosis with optional use of interposition grafts. The most significant distinction between the two treatments being that one aims to leave the forearm in a more functional position whereas the other focuses to increase or reestablish the ability to pro and supinate.

Aim: After review of the current literature, the aim of our case series was to critically analyze and compare the results of interposition of the extended lateral fasciocutaneous arm flap with other treatment options in regard to improvement in range of motion, recurrence and complication rate.

Methods: The cases under review included three cases of proximal radioulnar synostosis, of which two were post-traumatic and one was congenital. The surgical technique involves excising the synostosis and harvesting an extended lateral arm flap with a true distal skin island on a long pedicle. The flap is then routed through the cubital fossa, positioning the vascular pedicle where the synostosis excision was performed. The skin island is reinserted in the skin just proximal to the harvest zone. In order to secure vascularization intraoperative range of motion control is needed. The flap monitors vascularity of the fascia during exercises, which start immediately. The outcome was analyzed by chart review of range of motion, complication rate and recurrence.

Results: The mean long-term follow-up was 13 months. With regard to the range of motion, two highly promising results were observed, demonstrating a gain of 60° and 80° pronosupination. The third case was the sole instance of synostosis recurrence which needed a revision surgery. In this particular case a gain of only 40° pronosupination was observed. Both results are most likely a consequence of the patients noncompliance and a lack of adherence to physical and occupational therapy. As for the complications there was one temporary radial nerve palsy with a full recovery without intervention and one marginal necrosis of the skin island which required operative revision. All three patients were very satisfied with their results. They claimed to be able to complete all activities of daily life again and to be completely pain free.

Conclusion: For treatment of proximal radioulnar synostosis, especially using a pedicled flap, preoperative assessment and planning is crucial. Patients should be carefully chosen as the outcome depends on their post-operative compliance. Considering this, our proposed technique demonstrated highly promising results in both congenital and post-traumatic cases, exhibiting relatively low complication and recurrence rate.

A-0786 EXPANDING MCP ARTHROPLASTY OPTIONS: INITIAL EXPERIENCE WITH AN INVERSE TOUCH PROSTHESIS

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Introduction: Metacarpophalangeal (MCP) joint arthrosis can lead to pain, restricted motion, and loss of function. When conservative treatment fails, surgical alternatives include silicone implants, pyrocarbon devices, and surface gliding

metal polyethylene prostheses, each with distinct advantages and limitations described in current literature. To date, the implantation of an inverse Touch prosthesis for MCP joint reconstruction has not been reported but has potential advantages due to its design.

Aim: This case report presents the use of an inverse Touch prosthesis in the MCP-II joint and evaluates early postoperative functional results.

Material & Methods: A 58-year-old male patient with post-traumatic MCP-II arthrosis underwent implantation of an inverse Touch prosthesis after exhaustion of all conservative measures. Clinical evaluation at six months included measurement of active range of motion (ROM) of the MCP, PIP, and DIP joints, as well as grip strength assessment using a Jamar dynamometer.

Results: Six months after surgery, MCP-II ROM was 70/0/0° (flexion/extension). PIP and DIP ROM measured 60/0/0° and 80/0/0°, respectively. Isolated MCP-II flexion with maintained PIP and DIP extension was possible up to approximately 50°. Grip strength reached 40 kg. The prosthesis remained stable, and the patient reported improved hand function without major complications.

Conclusions: This first reported implantation of an inverse Touch prosthesis in the MCP-II joint demonstrated promising early functional outcomes, with stable motion and satisfactory grip strength at six months. The technique may serve as a valuable alternative in selected cases of post-traumatic MCP arthrosis, particularly when conventional implant options are limited. Additional clinical experience and long-term follow-up are needed to clarify durability, complication risk, and broader applicability.

A-0787 LONG-TERM OUTCOMES OF SURGERY VERSUS BOTULINUM TOXIN INJECTIONS FOR UPPER LIMB SPASTICITY IN ADULTS

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Introduction: Upper limb spasticity following central nervous system injury often leads to muscle overactivity, joint contractures and impaired arm and hand function. Botulinum toxin (BoNT) injections are widely used to reduce tone, but their transient effect limits long-term functional benefit. Spasticity-corrective surgery may provide more durable improvements.

Aim: evaluate the long-term efficacy of spasticity-correcting surgery and botulinum toxin treatment in patients with upper limb (UL) spasticity.

Material & Methods: Pretest-posttest quasi-experimental study. The patients were divided into surgery (n=17) and BoNT (n=17) groups, based on patient treatment preference. Interventions included tendon length/release in the surgery- and BoNT injections in the BoNT-group. The primary outcome measure was the Modified Ashworth Scale (MAS). The secondary outcomes included pain, range of motion, grip strength, grasp tests, and activity performance. Assessments were conducted at baseline for both groups, 3 months post-BoNT injection, and 6 months post-surgery, with an additional Results: The surgery group showed significantly greater reductions in composite MAS scores (mean change (SD) 2.7(0.8))

than the BoNT group at both the peak 1.1(0.6) and long-term 0.3(0.5) follow-up ($p<0.001$). The superiority of surgical treatment was further strengthened by significantly larger gains in secondary outcome measures, including range of motion, grip strength, task performance, and patient satisfaction. Surgery provides sustained benefits, whereas the effects of BoNTs are transient.

Conclusions: Spasticity-correcting surgery produces beneficial gains that exceed and last beyond those achieved with BoNT treatment in patients with disabling UL spasticity. These findings support considering surgical intervention in appropriate patients seeking long term benefit.

A-0788 POST-OPERATIVE RETURN OF TIP-TIP PINCH STRENGTH DIRECTLY AFTER MEDIAN NERVE DECOMPRESSION: COMPARING LACERTUS, CARPAL TUNNEL, AND DOUBLE CRUSH RELEASE

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Introduction: Tip-tip pinch weakness is typical for proximal median nerve compression (PMNC) and may assist in differentiating PMNC from carpal tunnel syndrome (CTS). The muscles responsible for tip-tip pinch—flexor pollicis longus (FPL) and flexor digitorum profundus of the index finger (FDP2)—are innervated by the anterior interosseous nerve. This median nerve branch remains unaffected in CTS. Proximal median nerve decompression has a positive influence on the anterior interosseous nerve and its motor signals, potentially leading to a restoration of strength.

Aim: Evaluate immediate and long-term tip-tip pinch strength after median nerve decompression, assessing Lacertus, Carpal Tunnel release, and double crush release.

Material & Methods: Sixty median nerve decompression patients were included: LR (n=20), combined LR and CTR (n=20), and CTR (n=20). Diagnoses were based on clinical examination and neurophysiological testing. Tip-tip pinch strength was measured using a Baseline Pinch Gauge, immediately preoperatively, and at 5-10 minutes, 3, 6, and 12 months postoperatively. Measurements were repeated three times and compared to normative ranges based on sex, age, and hand dominance. Changes in strength were assessed relative to baseline.

Results: The median strength gain for LR patients was +54% immediately postoperative, and remained stable at +54% after twelve months. CTR patients changed by -3% and +12%, respectively. Combined LR and CTR patients improved by +16% and +32%, respectively, and were stable between 3 and 12 months. A decrease in strength may be attributed to patients' fear of complications. Preoperatively, three LR patients (15%) met their normative strength range, improving to 15 (79%) after three months, compared to 10 CTR patients (50%) preoperatively and 11 (65%) after three months.

Patients reported high satisfaction rates, with 88% of LR, 94% of combined LR and CTR, and 81% of CTR patients would recommend their treatment to friends and family.

Conclusions: Tip-tip pinch strength improves immediately and remains increased after Lacertus release, whether alone or combined with CTR. Strength after Solitary CTR did not change, highlighting the importance of proximal decompression in restoring tip-tip pinch strength. The return of tip-tip pinch strength after proximal median nerve decompression is evident and may be a valuable diagnostic tool for differentiating it from CTS.

A-0789 EXPECTED OUTCOMES FOR RECONSTRUCTIVE HAND SURGERY AFTER SPINAL CORD INJURIES: INFLUENCE OF INJURY LEVEL AND SEX

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Introduction: Cervical spinal cord injury (cSCI) resulting in tetraplegia significantly impairs upper limb function. Tendon transfer surgery is a well-established method for restoring grasp and pinch function. However, the influence of injury level and sex on surgical outcomes remains underexplored.

Aim: This study aimed to assess postoperative grip and pinch strength, as well as grasp ability, in relation to the International Classification for Surgery of the Hand in Tetraplegia (ICSHT) and sex.

Material & Methods: A retrospective multicenter study was conducted, analyzing medical records of 143 patients (200 arms) who underwent tendon transfer surgery in Sweden (2006–2023) and New Zealand (1987–2019). Grip and pinch strength were measured using a hydraulic hand dynamometer and pinch gauge, respectively, while grasp ability was assessed with the Grasp and Release Test (GRT). Data were analyzed using paired and independent t-tests, with a significance threshold of $p < 0.05$.

Results: One year post-surgery, mean grip strength in the whole study population was 5.2 kg (SD 2.9), mean pinch strength was 2.1 kg (SD 1.2), and mean GRT score was 108 (SD 51). Men demonstrated significantly higher grip (5.8 kg vs. 3.5 kg, $p < 0.001$) and pinch strength (2.4 kg vs. 1.4 kg, $p < 0.001$) compared to women. Patients classified as ICSHT ≥ 4 achieved significantly higher grip strength (5.7 kg vs. 4.2 kg, $p = 0.001$) and grasp ability (120 vs. 93 repetitions, $p = 0.013$) compared to those classified as ICSHT ≤ 3 , though no significant difference in pinch strength was observed between ICSHT groups.

Conclusions: Grip and pinch strength, as well as grasp ability, improve significantly after tendon transfer surgery in individuals with cSCI. Postoperative outcomes are influenced by injury severity and sex, with men achieving greater strength and individuals with less severe injuries demonstrating higher grip strength and grasp ability, even when undergoing the same surgical procedure. These findings provide valuable reference values to guide clinical decision making and patient counseling regarding expected surgical outcomes.

A-0790 SCAPHOLUNATE INSTABILITY SURGERY FOR DORSAL INTERCALATED SEGMENT DEFORMITY (DISI) AND ITS SATISFACTORY RESULTS

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Introduction: Scapholunate instability is the most common form of carpal instability and represents the leading cause of post-traumatic wrist osteoarthritis. Excessive dorsiflexion of the wrist and pronation of the forearm are principal etiological mechanisms underlying this condition. Clinically, it is characterized by persistent dorsolateral wrist pain and difficulty during grasping activities.

In this case, surgery was performed for a patient presenting with severe pain and limited joint motion due to scapholunate dissociation. The objective of the procedure was to restore the anatomical alignment of the carpal bones, improve restricted joint mobility, and reduce pain.

Material & Methods: This study evaluates the scapholunate instability surgery performed in our clinic in September 2024 for a patient diagnosed with scapholunate dissociation (DISI deformity) accompanied by significant pain and reduced range of motion, as well as the postoperative follow-up process.

Results: A 57-year-old male patient presented with a 4-month history of pain and marked tenderness upon palpation over the dorsolateral aspect of the left wrist. Physical examination revealed significant loss of wrist extension and radial deviation, with partial limitation in flexion and ulnar deviation. Finger flexion was preserved; however, hyperextension was restricted due to pain, accompanied by motor weakness. Sensory examination demonstrated numbness in all digits. Preoperative anteroposterior and lateral radiographs showed a 3-mm gap between the scaphoid and lunate bones, with the scaphoid in a flexed position and the lunate dorsally angulated into extension.

Intraoperatively, scapholunate dissociation and laxity of the scapholunate ligament were observed. Two K-wires were used to fix the scaphoid and lunate in their anatomical positions. An additional oblique K-wire was inserted to maintain scaphoid–capitate alignment. Fixation was reinforced using an anchor suture applied to both the scaphoid and lunate. The procedure was completed with repair of the remnant ligament, joint capsule, and extensor retinaculum. The postoperative course was uneventful, and the patient was discharged. After one month of wrist splinting, the K-wires were removed and early physiotherapy was initiated.

Discussion: DISI deformity is a condition that can lead to substantial loss of hand function and, when diagnosis or treatment is delayed, rapid progression to osteoarthritis. Early surgical intervention has been shown to yield favorable outcomes. In this report, we highlight the significance of hand surgery techniques grounded in plastic surgery principles, describe the surgical procedure performed, and present the encouraging postoperative results. Patients were observed to return to their occupations in the long term.

Conclusions: Although scapholunate instability surgery for DISI deformity is technically demanding, it remains an essential treatment modality due to its high long-term success rates and its ability to prevent severe carpal bone and joint deformities.

A-0791 A NEW APPLICATION OF FASCIA LATA AUTOGRAFTS TO IMPROVE PERIPHERAL NERVE GLIDING: A CLINICAL FEASIBILITY STUDY

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Fascia Lata (FL) grafts have been widely used in diverse reconstructive procedures of the upper and lower extremities; however, their application to enhance nerve gliding has not been previously described. FL possesses favorable gliding properties that may improve neural excursion and reduce the risk of perineural fibrosis and adhesion. These characteristics are attributed to its high hyaluronic acid (HA) content, which contributes to tissue hydration and lubrication of interfacing surfaces. Fascia Lata harvesting is minimally invasive, associated with low donor-site morbidity, and more cost-effective than allograft alternatives. We propose using FL autografts to facilitate nerve gliding and provide external neural protection. **Surgical technique:** This method was applied to 8 patients with severe perineural fibrosis and to patients with neuroma in continuity of the median nerve at the wrist after multiple revision surgeries. FL was harvested in variable sizes, preserving the lubricant surface along the length of the affected nerve and, when indicated, the outer layer of FL as an external protective layer.

Results: Five patients had undergone carpal tunnel decompression. They had Recurrent and persistent compressive neuropathies with the sequelae of severe perineural fibrosis and scarring. The other three patients had a neuroma in

continuity after a distal forearm injury. The average follow-up for the patient was 10 months. All patients had full wrist extension without skin tethering or induced pain. Patients improved in terms of electrical shooting, with an average Visual Analog Scale (VAS) score of 2.

Conclusion: In this series, FL provided a biologically favorable, low-morbidity, and cost-effective autologous option that preserved nerve excursion while reducing pain associated with tethering. The consistent postoperative findings suggest that FL may offer meaningful functional benefits by enhancing neural gliding and mitigating adhesion formation.

A-0792 EXCISION OF A WELL-DIFFERENTIATED SQUAMOUS CELL CARCINOMA (SCC) ON THE DORSAL ASPECT OF THE MIDDLE FINGER AND CLOSURE USING A PERIOSTEAL FLAP AND FULL-THICKNESS SKIN GRAFT: A CASE REPORT

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Introduction: Case about a 91-y.o woman with dementia presented with a well-differentiated SCC on the dorsal aspect of the left middle finger (zone 2-3). Given the patient's significant comorbidities, ray amputation was initially considered. But considering the family's wish to avoid amputation, a conservative surgical approach was chosen.

Aim: To report a conservative surgical option for dorsal finger SCC in the absence of intact peritenon.

Material & Methods: After marking the lesion with a 3 mm safety margin, complete excision of the tumor on the proximal phalanx was performed. The epitenon was intact proximally to the proximal interphalangeal joint (PIP) but infiltrated the epitenon distally in the zone 2, making a direct skin graft impossible. Two random-pattern periosteal flap were elevated from beneath the extensor apparatus in zone 2 and mobilized dorsally over the extensor tendon. The surface was then covered with a full-thickness skin graft harvested from the anterior aspect of the left forearm.

Results: Postoperative follow-up at 2, 6, and 8 weeks showed complete healing of the skin graft without recurrence of the tumor. At 2 months the patient had a satisfactory motion.

Conclusions: Dual periosteal flaps combined with a full-thickness skin graft provide a reliable and function-preserving alternative to digital amputation in elderly patients with dorsal finger SCC when lacking of peritenon make a direct skin graft impossible.

A-0793 ENCHONDROMA OF THE DISTAL PHALANX: A COMMON ENTITY IN A RARE LOCATION

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Introduction: Enchondromas are intramedullary tumors composed of hyaline cartilage and represent the most common benign tumors of the hand and wrist, most frequently affecting the proximal phalanx. With an incidence peak between 10 and 30 years of age, diagnosis is generally made radiographically and is often incidental, as these lesions are commonly asymptomatic. When symptoms are present, they are often associated with pathological fracture or, more rarely, malignant transformation into osteosarcoma.

Aim: We present a case of an enchondroma of the distal phalanx of a finger, with clinical and radiological progression, as well as the selected surgical approach for its management and follow-up

Material & Methods: We report the case of a 40-year-old man, with no relevant medical or surgical history, presenting with

pain in the fourth finger of the hand with a 4-year duration. He attended the emergency department due to worsening pain after direct trauma and difficulty mobilizing the digit. Physical examination revealed swelling of the finger, mainly in the distal phalanx, nail-plate deformity, and limited flexion of the DIP joint.

Radiographs demonstrated an intramedullary lytic lesion with chondroid calcification, a narrow transition zone, and no periosteal reaction, consistent with an enchondroma, without signs of pathological fracture.

Results: Given the clinical presentation and risk of fracture, an open approach through the radial border was performed, with drilling of an entry window, curettage of the lesion, and filling of the cavity with synthetic bone substitute (Cerament®), followed by immobilization with a dorsal splint. The procedure was uneventful.

The distal phalanx and DIP joint were immobilized for 3 weeks. Histopathological examination confirmed the initial diagnosis.

The patient was followed for 2 months, showing favorable evolution, without residual joint stiffness, sensory deficits, and persistence of the nail-plate deformity, which did not represent an aesthetic concern for the patient.

Conclusions: Enchondromas are mostly asymptomatic and often detected incidentally. In the present case, trauma combined with worsening pre-existing discomfort led to diagnosis, with classical radiological findings. As the lesion occupied the entire distal phalanx, it should be considered a giant enchondroma according to the classification proposed by Takigawa in 1971. This location is atypical, as is the clinical presentation, and the chosen treatment approach mitigated the risk of complications (such as pathological fracture) and improved the patient's symptoms without associated adverse events. With this case, we aim to illustrate an atypical presentation of a common tumor, highlighting the role of surgical treatment and its favorable outcome.

A-0794 SIMULTANEOUS BILATERAL CARPAL TUNNEL RELEASE: A PROSPECTIVE STUDY

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Introduction: Simultaneous bilateral carpal tunnel release is traditionally deemed “impractical,” and surgeons seldom propose it. Yet, selected patients—often for logistical reasons—request concurrent surgery to avoid prolonged intervals between procedures and to decrease absence from work. Existing literature is sparse but raises no objections to this approach.

Aim: To evaluate the safety, functional outcomes, patient satisfaction, and recovery timeline of simultaneous bilateral open carpal tunnel release in patients with confirmed bilateral carpal tunnel syndrome.

Material & Methods: Prospective single-center study of 27 patients with bilateral carpal tunnel syndrome (CTS) confirmed by nerve conduction study, operated between January 2024 and May 2025 (14 women, 13 men; mean age 55 years [range 32–78]). Twelve patients were manual workers, 7 office workers, 7 retirees, and 1 unemployed. All but two underwent simultaneous open bilateral carpal tunnel release under local anesthesia, the other two had general anesthesia. Outcomes were evaluated using the Boston Carpal Tunnel Questionnaire (BCTQ), Symptom Severity Scale (SSS), and Functional Status Scale (FSS), completed preoperatively and at 2 weeks, 6 weeks, and 3 months postoperatively. Satisfaction was assessed via a 5-point Likert scale at 6 weeks and 3 months. The minimum clinical follow-up was 3 months.

Results: No intraoperative or postoperative complications were documented. Mean time return to leisure activities was 30 days; mean time to return to work was 33.5 days. SSS improved markedly at 2 weeks, with progressive increase at 6 weeks and 3 months. FSS showed transient decrease at 2 weeks, followed by recovery at 6 weeks and complete resolution by 3 months. All patients were satisfied or very satisfied (mean Likert score: 4.5/5).

Conclusions: Bilateral CTS occurs in 60–70% of cases. Comparative studies confirm rapid functional recovery (<5 days to autonomy in daily activities) and equivalent safety of simultaneous compared to staged surgery. The bilateral simultaneous approach is safe, effective, well-tolerated, and associated with high patient satisfaction. It minimizes work absenteeism, overall costs, delivering superior convenience without compromising outcomes.

A-0795 FUNCTIONAL AND AESTHETIC OUTCOMES AFTER COMPOSITE GRAFT IN TRAUMATIC FINGERTIP AMPUTATIONS: PRACTICAL RESULTS AND LESSONS FROM THREE CASES

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Introduction: Composite graft is a valuable reconstructive option for distal fingertip defects when microvascular replantation is not feasible due to vessel unavailability, severe crush or patient-specific limitations. This technique preserves digital length and contour while avoiding donor-site morbidity, offering an aesthetic and functional alternative to stump closure or local flaps. Even though the good results in children, historical concerns about graft viability in adults persist. **Aim:** The goal of the present study was to evaluate functional recovery, aesthetic results and technical details that optimize graft survival.

Material & Methods: We reviewed the cases of traumatic distal phalanx amputations treated with composite grafts. All cases were treated with meticulous debridement under digital block and the amputated tips were sutured, serving as non-vascularized composite grafts. All cases have done a protocol of thrombophylaxis and anti-platelet for 14 days. Every case had weekly wound care therapy and follow-up. Photographic logs were obtained. The time until surgery and timing of skin necrosis spontaneous separation was recorded. Active range of motion of the affected and contralateral fingers, digital length and functional score through Disabilities of Arm, Shoulder and Hand (DASH) were documented. All complications during the process were recorded. **Exclusion criteria:** Revision amputation or closure with local skin flaps. **Results:** Three patients met the inclusion criteria. One patient had a crush Ishikawa zone III injury and two had a cut injury in Ishikawa zones II and III respectively. The average time until surgery was 4.5h after trauma. Mean follow-up time was 21 months (9 to 28 months). Mean full epithelialization time was 82 days (57 to 101 days). Nailbed irregularities and mild stiffness were observed but caused no functional limitation. We observed a mean flexion deficit of -21° (-15° to -30°) regarding the distal interphalangeal joint of the injured finger when compared to the uninjured contralateral one. Loss of fingertip length ranged from -0.2 to -0.35 cm. All patients developed adequate pulp padding for fine pinch and regained protective sensibility though residual hypoesthesia was noted. Patients reported a mean DASH score of 4.98 and work DASH of 12.5. No major complications were noted.

Conclusions: This small series aligns with current evidence that composite graft provides favorable outcomes in clean-cut or minimally crushed distal phalanx injuries. Even when partial necrosis occurs, the graft frequently acts as a biological dressing until full wound healing.

We report near normal range of motion, high functional scores and high overall patient reported satisfactory results. Time until full wound healing may be superior to other surgical options and require more follow-up. Nevertheless, the simplicity of this technique makes it a good option for patients who want to preserve fingertip length. The limitations of our study are its small sample and non-comparative nature. Larger and comparative studies are necessary to validate these results.

A-0796 RIGHT PROCEDURE, RIGHT PLACE: OUTCOMES FOR PATIENTS UNDERGOING PROCEDURES FOR CARPAL TUNNEL RELEASE SURGERY IN NON-FORMAL THEATRE SETTINGS

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Introduction: The Right Procedure, Right Place (RPRP) initiative aims to enhance efficiency, optimise resource use, and improve patient outcomes by performing suitable elective procedures under local anaesthesia outside conventional operating theatres. Carpal tunnel release (CTR) surgery is a key candidate for this model, as it can be safely performed in non-formal theatre settings. RPRP seeks to increase patient satisfaction, reduce waiting list pressures, and minimise on-the-day cancellations by streamlining care pathways. Despite growing interest in this approach, evidence evaluating its impact on clinical outcomes at scale within the National Health Service (NHS) remains limited.

Aims: This study examined the implementation of RPRP for CTR surgery in selected NHS trusts and its effect on two safety and quality indicators: (1) 30-day emergency readmission and (2) repeat CTR on the same side within one year. We aimed to compare outcomes before and after RPRP adoption in trusts that had clearly defined transition timelines, and to evaluate whether performance differed from national trends.

Methods: CTR procedures were identified from the Hospital Episodes Statistics (HES) Admitted Patient Care dataset using OPCS-4 code A651, restricted to procedures listed in the first position. Eligible cases included patients aged ≥ 17 years undergoing CTR between 1 January 2018 and 30 June 2024. To avoid duplication, only the first CTR procedure per patient per laterality within the study window was included. Data from University Hospitals Birmingham and Royal Devon NHS Trusts—both with established pre- and post-RPRP periods—were analysed. A difference-in-difference framework was used to compare outcome changes in these trusts with the rest of England, with statistical significance defined as $p < 0.05$.

Results: Across the two trusts, 220,449 CTR admissions were identified, of which 217,083 (98.5%) met inclusion criteria as first-side procedures. Following RPRP implementation, no statistically significant difference was observed in the rate of repeat CTR within one year compared with national changes ($\beta = -0.22$, $p = 0.567$). Repeat surgery rates decreased from 0.84% to 0.53% in Birmingham/Devon and from 0.70% to 0.64% across the rest of England.

Similarly, no significant difference was found in 30-day emergency readmission rates post-implementation when compared with national trends ($\beta = -0.52$, $p = 0.052$). Local readmission rates improved from 1.47% to 0.47%, whereas the rest of England remained relatively stable (0.90% to 0.89%).

Conclusions: CTR performed under the RPRP model appears safe and effective, with outcomes comparable to or better than those observed in traditional theatre settings. Both participating trusts demonstrated reductions in repeat surgery and emergency readmissions following RPRP adoption, without evidence of adverse impact relative to national patterns. These findings support the wider integration of non-formal theatre environments for selected hand surgery procedures. As healthcare systems face increasing fiscal, workforce, and environmental pressures, RPRP offers a practical and scalable strategy to expand capacity, reduce waiting times, and maintain high-quality surgical care. Further research should evaluate patient-reported outcomes, cost-effectiveness, and implementation factors to inform broader adoption.

A-0797 RESTORING FUNCTIONAL BALANCE OF THE ULNAR WRIST: OUTCOMES OF ARTHROSCOPIC TFCC REPAIR

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Triangular fibrocartilage complex (TFCC) injuries are a common cause of ulnar-sided wrist pain and may lead to reduced grip strength and distal radioulnar joint (DRUJ) instability, ultimately disrupting the biomechanical balance of the wrist.

Preserving this delicate functional balance is essential for maintaining hand performance in daily activities. With continued advancements in minimally invasive techniques, arthroscopic management has become a central component of contemporary treatment strategies for TFCC injuries.

A retrospective review was conducted on 14 patients who underwent arthroscopic treatment for TFCC injury between January 2023 and January 2024.

Patients presented with wrist pain, weakness, and clicking sensations. Physical examination included the press, fovea and shear tests, and MRI was used to support diagnostic accuracy.

The mean patient age was 37.6 years (13–66), and 13 patients were female. Twelve procedures were performed under axillary block and two under general anesthesia.

Arthroscopy was carried out using the standard 3-4 and 6R portals. Synovial hypertrophy and torn edges were debrided. Peripheral TFCC tears were repaired with 3-0 PDS sutures using the outside-in technique, while central avascular tears were left unrepaired.

Outcomes were assessed based on pain level, grip strength and postoperative complications.

No cases of suture exposure, dorsal ulnar sensory neuropraxia, infection, hypertrophic scarring, joint stiffness or ECU tendinitis occurred.

Postoperative symptom changes were as follows:

- 6 patients reported complete resolution of pain,
- 4 patients reported significant improvement,
- 2 patients continued to experience symptoms,
- 2 patients were in the early postoperative period and excluded from final evaluation.

TFCC injuries remain a significant cause of ulnar-sided wrist pain and DRUJ instability. Physical examination supported by MRI is sufficient for diagnosis and treatment planning.

Arthroscopic repair is a minimally invasive technique with low complication rates and offers reliable restoration of the wrist's functional balance.

Findings from this series indicate that arthroscopic TFCC repair is a safe and effective treatment option when appropriately indicated.

A-0798 CRITICAL PATTERNS IN FLEXOR ZONE V TRAUMA, A FOUR MONTH RETROSPECTIVE STUDY

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Introduction: Flexor tendon injuries are common among hand traumas and can lead to significant functional impairment. Zone V is an anatomically critical area where the flexor tendons run proximally to the carpal tunnel and where numerous neurovascular structures are present. Structures such as the median nerve, ulnar nerve, and radial/ulnar arteries traverse this region, and Zone V injuries are frequently associated with multi-structure damage.

Therefore, Zone V injuries require a multidisciplinary approach in terms of diagnosis, treatment, and rehabilitation⁽¹⁾

The aim of this study is to evaluate, in the light of the literature, the clinical characteristics, injured structures, and surgical outcomes of patients who underwent surgery for flexor Zone V injuries

Methods: A total of 38 patients who underwent surgery for flexor Zone V lacerations between January 2025 - May 2025 were retrospectively reviewed. Patient data including age, sex, trauma etiology, injured and repaired anatomical structures, operative time, length of hospital stay, and drain usage were analyzed. Injured structures were categorized into tendon,

muscle, nerve, and vessel groups. Interpretations were based on descriptive data without performing statistical analysis.

Results:

- Total number of patients: 38
- Sex distribution: Male: 31 (81.6%), Female: 7 (18.4%)
- Mean age: 29.4 years (range: 13–45)

Trauma Etiology

- Glass laceration: 33 (86.8%)
- Spiral cutting tool: 3 (7.9%)
- Knife: 1 (2.6%)
- Metal impalement: 1 (2.6%)

Distribution of Injured Structures

Tendons

- FDS: 18
- FDP: 8
- FCU: 16
- FCR: 17
- PL: 7
- FPL: 6
- FPL muscle belly: 1
- BR (Brachioradialis): 1
- ERCL/ERCB: 2
- APL: 1

Muscles

- FCU muscle: 2
- Pronator teres: 2
- Brachioradialis muscle: 1

Nerves

- Median nerve: 9
- Ulnar nerve: 3
- AIN (anterior interosseous nerve): 2
- Radial nerve and radial cutaneous branch: 2

Vessels

- Ulnar artery: 5
- Radial artery: 3

Other Clinical Findings

- Mean operative time: 1 hour 52 minutes (range: 30 min – 3 h 50 min)
- Mean hospital stay: 2 days
- Drain usage:
 - Present: 29 (76.3%)
 - Not used: 9 (23.7%)
- Complex repairs (combined nerve/tendon/vessel): 13 patients (34.2%)

Discussion: Our study demonstrates that flexor Zone V injuries predominantly occur in young males and are most commonly caused by glass lacerations. The most frequently injured tendon was the FDS, followed by the FCR, FCU, and FDP. These findings are consistent with previous literature reporting that tendon, nerve, and vascular structures are frequently injured together in Zone V lesions.⁽²⁾

During the surgical repairs, modified Kessler core sutures with epitendinous augmentation were used. Neurovascular repairs were performed under a microscope, employing epineural nerve repair and arterial anastomosis when indicated. Drain placement was more common in cases involving combined muscle and nerve injuries, with the aim of preventing hematoma formation and potential compartment syndrome⁽³⁾

Conclusion: Flexor Zone V injuries are typically characterized by multi-structure involvement and represent a complex patient group in terms of surgical management and postoperative care. Glass laceration was the most common mechanism of injury, and a clear male predominance was observed. The findings of this study contribute to refining patient management protocols for Zone V injuries and provide a basis for future studies focusing on functional outcomes.

A-0799 PSYCHOSOCIAL CONSEQUENCES OF INCREASED CENTRAL SENSITIVITY IN RHEUMATOID ARTHRITIS: A TWO-GROUP COMPARISON BASED ON CUTOFF VALUE

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Introduction: Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disease primarily affecting the joints, yet its impact extends beyond musculoskeletal involvement. Patients often experience persistent pain, fatigue, functional limitations, and significant psychological burden, all of which compromise quality of life. Recent evidence suggests that RA-related pain cannot be fully explained by peripheral inflammation alone; central sensitization (CNS), reflecting heightened responsiveness of the central nervous system and lowered pain thresholds, contributes to pain amplification. CNS in RA has been linked to psychosocial factors such as depression, anxiety, and kinesiophobia, influencing the perception and experience of pain. Despite its clinical relevance, research exploring how CNS affects quality of life and psychosocial outcomes in RA remains limited.

Aim: This study aims to investigate whether there are significant differences in quality of life and other psychosocial factors based on the presence of CNS in individuals with RA.

Material & Methods: This cross-sectional study included 130 individuals with RA (118 females, 12 males), aged 19–65 years (mean 45.35 ± 13.17). Demographic and clinical data (age, education, marital status, smoking, alcohol use, disease duration, medications, comorbidities) were recorded. Central sensitization was assessed using the Central Sensitization Inventory (CSI), categorizing participants as $CSI < 40$ (no central sensitization) or $CSI \geq 40$ (central sensitization). The primary outcome was health-related quality of life (RAQoL), while secondary outcomes included pain (Short-Form McGill Pain Questionnaire), kinesiophobia (Tampa Scale), pain catastrophizing, learned helplessness, anxiety and depression (HADS), and biopsychosocial impact. All measures were self-reported. Between-group differences were analyzed using ANCOVA, with age, gender, disease duration, and medications as covariates. Holm–Bonferroni correction and partial η^2 (95% CI) were reported; $p < 0.05$ was considered significant. Analyses were performed using SPSS 23.

Results: In the ANCOVA model for RA-QoL, gender ($F(1,110)=1.64$, $p=0.202$), age ($F(1,110)=0.43$, $p=0.514$), diagnosis duration ($F(1,110)=0.56$, $p=0.456$), and medication use ($F(1,110)=0.58$, $p=0.448$) were not significant covariates. In contrast, central sensitization showed a robust effect ($F(1,110)=83.60$, $p<0.001$, partial $\eta^2=0.432$), indicating that higher sensitization levels substantially impair quality of life. Overall, the model was significant and explained 48% of the variance. ANCOVA results for secondary outcomes revealed significant group differences in sensory, emotional, and total pain, biopsychosocial impact, anxiety, depression, kinesiophobia, and pain catastrophizing (Holm–Bonferroni-corrected $p<0.01$; partial $\eta^2=0.16–0.47$). Learned helplessness did not differ between groups ($p=0.104$).

Conclusions: These findings indicate that high central sensitization in individuals with RA strongly affects quality of life and psychosocial status. Elevated pain intensity, biopsychosocial impact, depression, anxiety, kinesiophobia, and pain catastrophizing in the high-sensitization group further emphasize the role of psychosocial factors in disease experience. The absence of a difference in learned helplessness suggests involvement of distinct psychological mechanisms. Overall, assessing central sensitization may be valuable in guiding multidisciplinary treatment and individualized management strategies in RA.

A-0800 COMPLICATIONS IN TRAPEZIECTOMY SURGERY: TO RECONSTRUCT OR NOT TO RECONSTRUCT

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Background: First carpometacarpal I (CMCI) osteoarthritis can lead to significant pain in the hand and wrist. Established treatment consists of physical therapy or splinting, and operative procedures. Surgical management most commonly consists of trapeziectomy. The remaining cavity, may be left empty or can be filled through reconstructive procedures like ligament reconstruction and tendon interposition (LRTI) or Weilby procedures. Both procedures are proven to be effective. However, the superior technique remains unclear. reconstruction may potentially provide better outcome. However, it is a more invasive technique and may also be more prone to complications. This study aims to assess the complication rate in trapeziectomy with and without reconstructive efforts. We hypothesize that trapeziectomy with reconstruction does not yield more complications than trapeziectomy without reconstruction.

Methods: This study uses retrospective chart review of patients undergoing trapeziectomy in three Dutch medical centers. Patients who underwent surgical management were identified using financial registration codes. Reconstructive efforts were divided into LRTI procedures and Weilby procedures. Data was gathered on patient demographics, surgical details, and the presence, nature, and management of complications. To assess patient satisfaction, a supplementary questionnaire alongside the quickDASH were used. Currently, data collection of the questionnaires is still being completed.

Results: A total of 118 procedures were identified in 106 patients. Of which 73 trapeziectomies without reconstruction and 45 reconstructions of which 21 LRTI procedures, 24 Weilby procedures. The complication rate in the trapeziectomy group 19.2%, the reconstruction group was 31.1%. Reoperation rates were 1.4% in the trapeziectomy group and 4.4% in the reconstruction group. Chi-squared testing did not show a statistically significant difference in complication presence or reoperation rate. The quickDASH scores were not significantly different across the groups. However, the reconstruction group did report significantly more difficulties in exercising their hobbies. The supplementary questions did not show any significant differences. However, a trend was observed which showed the trapeziectomy group may be more likely to recommend the treatment to others (p-value 0.061).

Conclusion: In this analysis, reconstruction does not show significantly more complications than simple trapeziectomy. Patient satisfaction was largely similar.

A-0801 COMPLICATIONS IN TRAPEZIECTOMY SURGERY: TO RECONSTRUCT OR NOT TO RECONSTRUCT

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Conclusion In this analysis, reconstruction does not show significantly more complications than simple trapeziectomy. Patient satisfaction was largely similar.

A-0802 LATE FLEXOR TENDON RECONSTRUCTION IN TWO STAGES WITH MODIFIED PANEVA-HOLEVICH TECHNIQUE: CLINICAL RESULTS AND RELATED PATIENT OUTCOMES

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Introduction: Flexor tendon injuries of the hand remain a major challenge in reconstructive surgery, particularly in cases with delayed presentation or extensive damage to soft tissues that precludes primary repair. When primary tendon repair or one-stage reconstruction is not feasible, two-stage reconstruction techniques are indicated. The modified Paneva-Holevich method represents a reliable two-stage approach that uses a silicone rod to create a pseudosheath for later placement of a tendon graft.

Aim: The aim of this study was to evaluate the clinical outcomes and patient satisfaction following late flexor tendon reconstruction performed in two stages using the modified Paneva-Holevich technique.

Material & Methods: A retrospective review was conducted on ten patients (seven male and three female) who underwent two-stage flexor tendon reconstruction with the modified Paneva-Holevich technique between 2022 and 2025. The mean patient age was 37 years (range 27–47 years). All patients presented with neglected isolated digit flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) tendon injuries in zone II. The average interval between the first and second stage was seven months and seven days. In the first stage the proximal stumps of the superficialis and profundus tendons were sutured together at the level of the palmar crease making a loop and tagged with a suture. A tiemann catheter of appropriate diameter was attached to the FDP stump distally. Then reconstruction of A2 and A4 pulleys was performed using a tendon autograft, if necessary. After sufficient maturation of the pseudosheath, confirmed clinically and functionally, the second stage was performed during which the tiemann catheter was removed and replaced by a tendon autograft of the FDS as described in the Paneva-Holevich technique. Postoperative rehabilitation followed a standardized early passive motion protocol. Functional outcomes were assessed using TAM (Total Active Motion) score and patient satisfaction was evaluated through self-reported measures of hand function and appearance.

Results: All six patients completed both stages of the procedure and the rehabilitation protocol without major complications.

The mean follow-up period was six months after the second stage. Total active motion ranged between 170° and 240°. Grip strength recovery averaged 80% compared with the contralateral hand. No cases of tendon rupture, adhesion requiring tenolysis or significant contracture were observed. All patients reported satisfactory to excellent functional recovery, with return to daily activities and manual work. Cosmetic appearance of the operated fingers was also rated satisfactory by all patients.

Conclusions: The modified Paneva-Holevich two-stage technique remains a reliable and effective method for late reconstruction of flexor tendon injuries, especially in complex or delayed cases where primary repair is not possible. In this small series, all patients achieved good to excellent functional outcomes, with high levels of satisfaction and minimal complications, despite the long interval time between the two stages. These results confirm that the modified Paneva-Holevich approach is a valuable option for staged flexor tendon reconstruction in carefully selected patients.

A-0803 NICKEL ALLERGY CMC JOINT ARTHROPLASTY: CLINICAL OUTCOMES AND RELEVANCE

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Introduction: Symptomatic thumb carpometacarpal (CMC) osteoarthritis represents the most common degenerative condition of the hand that ultimately requires surgery. Over recent years, a noticeable shift in surgical management has occurred, moving from trapezectomy toward total joint arthroplasty of the CMC joint. As the number of patients considered candidates for CMC joint replacement continues to rise, the proportion of individuals with known or suspected material hypersensitivities is increasing as well. This issue is particularly relevant because the neck component of currently used modular “dual mobility” CMC prostheses is made of stainless steel, which contains nickel. Consequently, concerns have emerged about whether pre-existing nickel allergy may negatively influence clinical outcomes. Despite the high prevalence of nickel sensitization in the general population, evidence regarding its importance in CMC arthroplasty remains scarce. This study therefore investigates whether nickel allergy plays a clinically meaningful role after CMC joint replacement.

Aim: The objective of this study was to analyze postoperative outcomes, patient satisfaction, functional parameters, and complication rates in patients with confirmed nickel allergy who underwent thumb CMC joint arthroplasty. We aimed to determine whether nickel sensitization could be associated with inferior results or higher revision rates compared with typical outcomes reported for this procedure.

Material & Methods: Since 2022, a total of 223 CMC joint prostheses have been implanted at our specialized hand surgery center. As part of the routine preoperative evaluation, all patients were systematically asked about nickel allergies. We retrospectively identified and assessed eight patients with a dermatologically confirmed nickel allergy. Three patients were diagnosed with nickel allergy only after surgery, while five were aware of their allergy preoperatively yet opted—after detailed counselling—to proceed with implantation. Standardized clinical and radiographic follow-up was performed, including a comprehensive evaluation using PROMs (DASH, MHQ), NRS, Kapandji score, grip and pinch strength.

Results: The mean follow-up period was 14.6 months. Patients had an average age of 63 years at the time of surgery. Postoperatively, mean NRS scores were 1.7 at rest and 4.9 during activity. The Kapandji score improved from a preoperative average of 8 to 9.4 postoperatively. Mean DASH and MHQ scores were 23.5 and 22 points, respectively. Average grip strength measured 22.5 kg, pinch strengths of 3.6 kg (tip pinch) and 4 kg (key pinch). Four of the six employed patients successfully returned to their previous occupation. Overall patient satisfaction was 63%, and six patients indicated they would choose the procedure again. Three patients experienced complications requiring revision to trapezectomy; no clear hypersensitivity reactions attributable to nickel were observed.

Conclusions: CMC arthroplasty in nickel-allergic patients did not achieve the typically reported high levels of satisfaction, strength improvement, and pain relief. Although causality cannot be established due to the small sample size, and no overt implant hypersensitivity reactions occurred, the comparatively lower satisfaction rates and functional scores suggest that the choice of implant material may play a role. For patients with confirmed nickel allergy, the use of a nickel-free titanium prosthesis should therefore be considered.

A-0804 FUNCTIONAL OUTCOMES AFTER GANGLION CYST SURGERY

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The aim of this study was to evaluate the clinical outcomes and recurrence rates of patients who underwent surgical treatment for wrist ganglion cysts in our clinic between 2024 and 2025.

Materials and Methods: A total of 43 patients (13 men and 30 women) who underwent surgery for wrist ganglion cysts between January 2024 and September 2025 were retrospectively reviewed. The mean age was 32.4 ± 8.6 years. Eleven patients were followed up clinically for at least six months postoperatively. All patients underwent open excision for dorsal or volar wrist ganglion cysts. Recurrence was assessed based on clinical examination and ultrasonographic findings. **Results:** Among the 11 followed patients, symptoms completely resolved in 9 cases (81.8%), while 2 patients (18.2%) experienced cyst recurrence at the same site. One recurrence was dorsal and one was volar in location. The recurrence rate was consistent with previously reported rates (5–15%) following open excision. No major complications such as infection, neurovascular injury, or persistent stiffness were observed during follow-up.

Conclusion: Our findings support open excision as an effective and safe treatment method for wrist ganglion cysts, providing substantial symptom relief and acceptable recurrence rates consistent with the literature. Longer follow-up periods and comparative studies with arthroscopic techniques are needed to further optimize treatment strategies.

Keywords: Ganglion cyst, wrist, surgical treatment, open excision, recurrence

A-0805 VOLAR PLATE RECONSTRUCTION IN THE SURGICAL MANAGEMENT OF POST-TRAUMATIC FLEXION CONTRACTURES - A CASE REPORT

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Introduction: Flexion contracture of the proximal interphalangeal (PIP) joint can have a profound negative impact on daily activities. There are few studies in the literature on the results of surgical release of the PIP joint.

Aim: The aim of this study is to report the surgical treatment method and the results of this surgery in a patient with post-traumatic flexion contracture of the PIP joint.

Material & Methods: An 18-year-old female patient presented to us with the complaint of difficulty in extending her left index, middle and ring fingers. The patient's history was that her complaints started approximately 2 years ago after a suicide attempt from the 6th floor, multiple trauma surgeries and a long-term intensive care history.

In the physical examination, when the left hand fingers were brought into forced extension, there was a 90 degree opening in the left hand D2 PIP joint, a 40 degree opening in the left hand D3 PIP joint, a 170 degree opening in the left hand D4 PIP joint, a 160 degree opening in the left hand D3 DIP joint, and a 70 degree opening in the left hand D5 PIP joint. At the same time, the flexion of the left hand D4-5 MP joint was limited.

In the surgical exploration of the patient, Lazy-s incisions performed for skin incision. Tenolysis was applied to the left hand D2-3-5 Flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) tendons. The volar plate was loosened at the level of the left hand D3 PIP joint with an incision. Then, in order to prevent the developing PIP joint hyperextension and possible swan neck deformity, the FDS slip on the left hand D3 radial side was incised from a point close to the insertion of the volar plate and sutured to the proximal part of the volar plate, and PIP joint stabilization was achieved. No splint was applied to the patient. Results: Active movement was started on the patient's 3rd day of the postoperative period. The patient then received 15 sessions of physical therapy. In the 6th month postoperatively, the patient's almost perfect active movements, passive range of motion and pain reduction were observed.

Conclusions: Although the volar plate is important in joint stabilization, it can cause contracture in long-term immobilization and the absence of physical therapy. Unfortunately, tenolysis and skin expander techniques (z-plasty etc.) alone are not sufficient in the most cases management of advanced flexion contractures. In such cases, it may be necessary to resort to volar plate release and reconstruction. One of the most important points to be considered in surgery is to prevent the joint from going into hyperextension and to minimize the development of additional deformity. Of course, protecting the neurovascular bundles during surgery, preventing their excessive tension and performing staged surgery if necessary should also be considered as an option.

A-0806 CONTINUOUS SUTURATION VS CORE SUTURATION IN EXTENSOR TENDON LACERATION COMPLICATION OUTCOMES

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Introduction: Extensor tendon injuries are lesions that significantly affect hand function and require careful surgical repair. The aim of this study was to compare two different suture techniques—continuous suture and core suture—used in extensor tendon repairs presented to our emergency department between January 2024 and August 2024, in terms of clinical success, complication rates, and functional outcomes.

Aim: Material & Methods: A total of 50 patients who underwent surgical repair for extensor tendon injuries resulting from lacerations on the extensor aspect of the hand in 2025 were retrospectively analyzed. Patients were divided into two groups based on the suture technique used: Group A (n=29) underwent continuous suture repair, and Group B (n=23) underwent core suture repair. Postoperative tendon rupture rates, extension loss, need for repeat surgery, and functional outcomes (TOM – Total Active Motion) were evaluated. Categorical variables—such as tendon rupture rate and need for repeat surgery—were compared between groups using the Chi-square test or Fisher's exact test when expected cell counts were <5. Continuous variables—such as extension loss and TAM—were assessed for normality using the Shapiro–Wilk test. Normally distributed variables were compared using an independent samples t-test, whereas non-normally distributed variables were analyzed with the Mann–Whitney U test.

Results: Mean follow-up was 6 months. The tendon rupture rate was 16.7% in Group A; it was found to be 3.3% in Group B ($p>0.05$). The mean TAM score was 185° in Group A and 192° in Group B ($p>0.05$). No significant difference was found between the groups in terms of infection rates and healing times. However, it was observed that early mobilization protocols were safer in the core suture group.

Conclusions: Both continuous and core suture techniques yield similar clinical results in extensor tendon repairs. However, the core suture technique may offer advantages in early rehabilitation. The choice of surgical technique should be made considering the location of the injury, the quality of the tendon, and the surgeon's experience.

A-0807 ANATOMICAL BASIS FOR POOR TREATMENT OUTCOMES OF DISTAL RADIAL METAPHYSIS FRACTURE WITH EXTERNAL FIXATION DEVICE

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Introduction: The use of external fixators for distal radial metaphysis fractures in traumatology and orthopedics is an element of so-called damage control. This can be either an intermediate or a definitive fixation method. When using the distraction method as a definitive fixation option, we often observe incorrect fracture reduction and malunion.

Aim: To evaluate the reasons why the distraction method does not lead to good treatment outcomes for distal radial metaphysis fractures.

Material & Methods: We analyzed computed tomography scans of 23 patients who sustained comminuted fractures of the distal radial metaphysis and whose treatment was carried out using a distraction device. The distal fixators of the device were passed through the metacarpal bones. The proximal elements of the device were passed through the radius proximal to the fracture site. The position of the bone fragments of the distal radial metaphysis was assessed, as well as the effect of distraction on the position of the carpal bones. To correctly assess the position of the bone fragments and carpal bones, MPR slices were constructed in three standard projections.

Results: When evaluating computed tomography slices in the anteroposterior projection, an increase in the diastasis between the fragments of the distal radial metaphysis and the bones of the proximal carpal row is noted. Distraction also increases the distance between the bones of the proximal and distal carpal rows. The average increase in the distance between the radius and the scaphoid bone, and between the radius and the lunate bone, was 87% compared to normal. The increase in distance in the midcarpal joint, between the lunate and capitate bones, and between the scaphoid and capitate bones, was 56%.

In the sagittal plane, dorsal displacement of the proximal scaphoid bone in the dorsal direction, averaging 6.63 mm relative to the central position in the scaphoid fossa of the distal radial metaphysis, is noted.

In the absence of concomitant injury to the scapholunate ligament, the lunate bone also displaces dorsally relative to the lunate fossa, by an average of 4.49 mm.

The radius was over-distractioned by an average of 178%.

Conclusions: The distraction method is used in cases of comminuted fractures of the distal radial metaphysis. Its principle is based on ligamentotaxis. However, the arrangement of the ligaments relative to various structures of the wrist joint and their attachment points should be taken into account. Their arrangement is very uneven. Distraction of the wrist joint leads to both uneven displacement of the fragments of the distal radial metaphysis and the influence of the ligaments of the wrist joint on the position of the carpal bones. The radioscaphocapitate ligament plays a major role here, whose tension leads to dorsal displacement of the scaphoid bone. The total distraction of the radiocarpal and midcarpal joints exceeds the distraction in the radiocarpal joint. Dorsal ligaments of the wrist joint, such as the radioscaphoid ligament, cannot counteract this influence, and prolonged fixation of the wrist joint in such a position leads to irreversible changes, which significantly impairs wrist joint function.

A-0808 RESTORING FUNCTIONAL BALANCE IN MALLET FINGER: COMPARATIVE RESULTS OF SPLINTING, PIN FIXATION AND EDC PLICATION

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Purpose: To compare the effectiveness of splinting, percutaneous pin fixation, and EDC plication in restoring extensor-flexor balance of the distal phalanx following mallet finger injuries.

Methods: A retrospective analysis was conducted of 40 patients treated between 2020 and 2024: splinting (n=17), pin fixation (n=13), and EDC plication (n=10). Parameters evaluated included: DIP extension loss, DIP flexion, QuickDASH scores, complications, and 6-month patient satisfaction.

Findings: Mean extension loss decreased from 13° in the splint group to 6° in the pin fixation group and to 4° in the EDC plication group; This indicated that terminal extensor balance was better achieved with surgical methods.

DIP flexion angles were maintained in all groups (57°, 62°, 64°), demonstrating the maintenance of flexor-extensor synergy. QuickDASH and satisfaction scores favored surgical treatments (splint: 15.1 / 7.0; pin: 12.3 / 8.1; EDC plication: 10.8 / 8.9). Complications were minor, consistent with the biomechanical loading of each method: skin irritation with the splint (18%), pin-path problems with pin fixation (15%), and mild postoperative tenderness with plication (10%).

Conclusion: Mallet finger disrupts the delicate functional balance between the terminal extensor mechanism and flexor forces. While all three treatment modalities contribute to restoring this balance, EDC plication offered the most balanced functional recovery by combining the best restoration of extension with the preservation of flexion. The treatment approach should focus not only on anatomic correction but also on restoring functional balance in the hand, depending on the patient's injury type and compliance.

A-0809 ELASTIC INTRAMEDULLARY NAILING VS K-WIRE FIXATION FOR UNSTABLE METACARPAL FRACTURES IN ADOLESCENTS

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Introduction: The purpose of this study was to determine whether elastic intramedullary nailing has advantages over K-wire fixation for treatment of unstable metacarpal fractures in adolescents.

Materials and Methods: This was retrospective follow-up study including 32 patients in adolescent age with unstable metacarpal fractures who underwent surgery divided in two groups- 21 patients with elastic intramedullary nail and 17 patients with K-wires. Radiographic and clinical outcomes for the two groups were compared.

Results: During the period under review, 32 patients with 38 unstable metacarpal fractures met the inclusion criteria, and the fractures were managed with either intramedullary nailing (n=21) or percutaneous K-wire fixation (n=17). The mean age of the patients during the trauma was 16.8y (13-18 y). The mean total active range of motion, grip strength and radiographic healing showed no statistically significant difference between the two groups. No union failures were observed in either group. However, the intramedullary nailing group returned to daily activities and school earlier by an average of 2.3 weeks. Complications were reported only in the K-wire fixation group.

Conclusion: Our results show both methods have comparable clinical and radiological outcomes. With potential benefits like lesser surgical time, more stability and no need of immobilization, elastic intramedullary nailing could be safer and effective method for treatment of unstable metacarpal fractures in adolescents.

A-0810 CLINICAL EVALUATION OF A NOVEL FLEXOR TENDON REPAIR TECHNIQUE – EARLY OUTCOMES OF THE ELSAFTAWY SUTURE APPLICATION

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Introduction: Flexor tendon repair remains a challenging field in hand surgery, where achieving an optimal balance between mechanical strength, gliding function, and biological healing is crucial. Current repair techniques, while mechanically robust, are often complex, costly, and risk disturbing the delicate balance of tension across tendon ends. The newly developed Elsaftawy suture was designed to restore this equilibrium by providing a strong, evenly loaded, and low-profile repair that facilitates early rehabilitation without requiring looped sutures or intratendinous knots.

Aim: To prospectively evaluate the clinical safety, functional outcomes, and complication rate of the Elsaftawy suture in primary tendon repairs performed under routine hand surgery conditions.

Material & Methods: A prospective multicentre study was conducted involving 22 consecutive patients (13 men, 9 women) treated for flexor or extensor tendon lacerations using the Elsaftawy suture. The technique utilizes a 6-strand, non-looped configuration with external knot placement, providing uniform tension distribution. The cohort included 62% flexor digitorum profundus (FDP), 46% concomitant flexor digitorum superficialis (FDS), and 14% flexor pollicis longus (FPL) injuries. Injuries were distributed across zones I–IV, with zone II being the most frequent (45%). The mean delay from trauma to surgery was 17 days (range 0–46). Patients followed an early protective active motion rehabilitation protocol. Functional assessment included Total Active Motion (TAM), Modified Strickland Scale, complication rate, and return-to-work time. Minimum follow-up was 57 days (mean 173).

Results: At the time of analysis, 90% of patients experienced uneventful recovery with no suture rupture. Two patients (9%) had complications: one re-rupture requiring two-stage reconstruction and one case of tendon adhesions in zone III requiring tenolysis. Two patients were lost to follow-up. The mean return to work was 4.5 months (range 2.5–9). No infections or pulley-related complications were observed. Preliminary functional results at 12 weeks and 6 months demonstrated satisfactory recovery of motion and grip strength, with Modified Strickland outcomes comparable to contemporary 6-strand methods. Biomechanical testing on a porcine model confirmed no statistically significant difference in gap resistance ($p=0.2368$) or ultimate failure strength ($p=0.6232$) compared to the Jin Bo Tang technique, supporting its mechanical reliability.

Conclusions: The Elsaftawy suture provides a balanced, accessible, and cost-effective alternative to existing high-strength flexor tendon repair methods. By combining simplicity of execution, even load distribution, and external knot placement, it preserves tendon gliding and facilitates early rehabilitation. Early clinical results confirm its safety and functional effectiveness. Ongoing follow-up aims to validate these findings through comprehensive functional and statistical analysis.

A-0811 INTERNATIONAL COLLABORATION TO ENHANCE KNOWLEDGE AND EXPERIENCE IN UPPER LIMB SPASTICITY: OUR EXPERIENCE

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Introduction: Operative management of upper limb spasticity is a demanding subspecialty. It typically represents only a portion of a surgeon's workload, and individual case volumes are often low. As a result, many surgeons work in relative isolation, accumulating significant experience over time but lacking opportunities to discuss complex cases with peers who share similar expertise.

Aim: To explore whether structured international collaboration, case discussion, and knowledge exchange can enhance clinical decision-making and improve the management of this low-volume, high-complexity patient group.

Material & Methods: In June 2024, during the FESSH meeting, a collaboration group was formed comprising three surgeons from the UK, Sweden, and the Czech Republic. Communication occurred via a secure social media platform (WhatsApp), adhering strictly to patient confidentiality. Complex cases were reviewed, and international visits were arranged to observe clinical practice, participate in joint assessment clinics, and share assessment and operative techniques.

Results: Multiple challenging cases were discussed within the group. Cross-country visits facilitated combined operating lists and joint clinical assessments of complex patients. Members exchanged approaches to clinical evaluation, compared operative strategies, and analysed strengths and limitations of different healthcare systems.

Conclusions: This international collaboration has functioned effectively and enabled participating surgeons to broaden their knowledge, refine their clinical skills, and improve confidence in managing upper limb spasticity. Continued expansion of such networks may further enhance the quality and safety of care for this highly specialised patient population.

A-0812 CLINICAL OUTCOMES OF MAGNIFIED MINI-OPEN TRANSVERSE WRIST-CREASE CARPAL TUNNEL RELEASE: A PROSPECTIVE CONSECUTIVE SERIES

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Introduction: Persistent pillar pain and delayed return to work remain the most frequent drawbacks of the standard mini-open carpal tunnel release (CTR). In an attempt to avoid incisions within the sensitive thenar–hypothenar pillar region, endoscopic techniques were developed. Although effective, endoscopic CTR requires specialized and expensive equipment, an anesthesiologist, longer operating time, and a dedicated endoscopic tower. For this reason, the majority of surgeons still perform standard mini-open CTR under WALANT anesthesia, which is simple, fast, and cost-effective—but often associated with prolonged tenderness and slower functional recovery lasting up to six months.

The present study explores a modified magnified mini-open approach designed to maintain the simplicity of WALANT while providing endoscope-like visualization, using readily available surgical loupes instead of a camera system.

Aim: To assess the clinical safety and functional outcomes of a Magnified Mini-Open Transverse Wrist-Crease Carpal Tunnel Release performed under direct vision using 5× magnification and coaxial illumination, and to determine whether this approach avoids complications typical of standard mini-open CTR.

Material & Methods: A prospective consecutive series of patients undergoing carpal tunnel release was analyzed. All operations were performed by a single surgeon using ExamVision Keppler Advanced 5.0× surgical loupes with the Focus coaxial light source. The transverse skin incision was placed along the distal wrist crease. After blunt dissection and ulnar retraction of the palmaris longus tendon, the antebrachial fascia was incised sharply. The flexor retinaculum was separated from thenar muscles by blunt sweeping and then divided under direct magnified visualization.

Outcomes were assessed with the Boston Carpal Tunnel Questionnaire (BCTQ) before surgery and at six weeks post-operatively. Primary endpoint: change in total BCTQ score. Secondary endpoints: remission rate (BCTQ ≤ 28.5 points) and patient satisfaction ("Would you recommend this procedure?").

Results: Fifty-seven paired assessments were analyzed.

Pre-operative BCTQ: 60.3 ± 13.9

Post-operative (6 weeks): 19.0 ± 19.8

Mean change: -41.3 points (95% CI -47.1 to -35.5), $p < 0.0001$ (paired t test; Wilcoxon $p < 0.0001$).

Effect sizes: SRM = 1.89, Glass's Δ = 1.84, Hedges's g = 1.83 (very large).

Remission rate: 71.9% (BCTQ ≤ 28.5).

Clinically meaningful improvement (≥ 10 points): 94.7%.

Patient recommendation rate: 76.5%.

Sensitivity analyses (outlier removal, winsorization, and remission-only subsets) confirmed the stability of the effect.

Symptom duration (column H) showed no significant correlation with BCTQ improvement (Spearman $\rho \approx 0$, $p > 0.05$).

No intraoperative complications were observed; two patients required re-exploration for incomplete release due to limited intraoperative visualisation.

Conclusions: The Magnified Mini-Open Transverse Wrist-Crease Carpal Tunnel Release provides excellent short-term clinical improvement with minimal morbidity. It combines the simplicity and low cost of the mini-open WALANT technique with enhanced visualization comparable to endoscopic release. Early results indicate a very large functional effect size and a high rate of patient satisfaction, suggesting this method is a safe, ergonomic, and accessible alternative for hand surgeons equipped with standard microsurgical loupes. Further comparative studies with the classical mini-open approach are planned to validate these findings.

A-0813 PRE- AND POSTOPERATIVE NEUROPHYSIOLOGICAL AND PATIENT-REPORTED OUTCOMES IN ULNAR NERVE ENTRAPMENT; BALANCING SUBJECTIVE AND OBJECTIVE OUTCOMES

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Introduction: Functional recovery after ulnar nerve decompression at the elbow requires restoration of the balance between neural conduction, sensory feedback, and motor control of the hand. Neurophysiological improvement is often slow. Patients frequently report earlier relief of pain and sensory symptoms. This discrepancy highlights the importance of evaluating both objective and subjective aspects of recovery.

Aim: To investigate changes in neurophysiological and clinical parameters alongside patient-reported outcomes after surgical decompression for ulnar nerve entrapment at the elbow (UNE), and to explore the relationship between electrophysiological recovery and perceived hand function.

Material & Methods: A prospective cohort of 41 patients with UNE underwent decompression surgery or decompression with AIN-transfer at two Swedish referral centres. Preoperative and 12-month postoperative assessments included nerve conduction studies of the ulnar nerve, hand strength (Jamar grip and key-pinch), and monofilament sensory testing (SWM). UNE symptoms were graded according to a 5-grade scale based on severity. Patient-reported outcomes were assessed using the Swedish Patient-Rated Ulnar Nerve Evaluation (PRUNE-S) with a minimal detectable change (MDC95) of 10 points. Neurography findings were graded to a grading system (0: normal, 1: mildly reduced conduction velocity, 3a-c: axonal degeneration with a: normal conduction velocity; b: reduced conduction velocity; c: conduction block). Statistical analyses made with Wilcoxon Signed Ranks Test, McNemar–Bowker test and the Kruskal Wallis test.

Results: The mean age of the patients was 52 years (SD 16); 59% were male, and in 59% the dominant arm was involved. Fifteen percent had diabetes, and 7% suffered from polyneuropathy.

At inclusion there was a significant difference in PRUNE-S sensory subscale across the neurography grades ($p = 0.042$) and SWM ($p = 0.008$). At 12 months, SWM at the fifth finger showed significant improvement ($p < 0.001$), however, grip strength and key pinch did not increase significantly. Motor conduction velocity (MCV) across the elbow segment for neurography grade 1 and 3b increased from 34.1 [22.7] to 47.2 [25.8] ($p < 0.001$). The improvement in MCV correlated moderately with PRUNE-S improvement ($p = 0.560$, $p = 0.037$) for neurography grades 1 and 3b.

Across symptom grades, postoperative change in MCV differed significantly overall ($p = 0.040$), with the greater improvement in grade 5 (constant sensory symptoms with motor impairment and atrophy) compared with grades 2a+2b (2a: intermittent sensory symptoms with subjective motor symptoms, no objective motor impairment, 2b: constant sensory symptoms, no motor symptoms) ($p = 0.032$). The PRUNE-S total score preoperatively versus postoperatively improved from 51 [25] to 21 [33] ($p < 0.001$), with a median change of 23 points; well above the MDC95 for the PRUNE-S, showing a clinically significant improvement in perceived hand function.

Conclusion: One year postoperatively, patient-reported outcomes and perception of touch are significantly improved. This suggests that subjective recovery appears before measurable nerve conduction improvement, particularly in MCV. Assessable recovery of motor function could not be shown. Delayed motor recovery is a well-known phenomenon since it is dependent of axonal recovery. The results highlight the dynamic balance between neural regeneration and functional adaptation of the hand.

A-0814 RESTORATION OF GRIP AND JOINT BALANCE WITH HEMIHAMATE ARTHROPLASTY IN PIP JOINT ARTHROSIS: A SERIES OF 5 CASES

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Introduction: Proximal interphalangeal (PIP) joint injuries are traumatic conditions that significantly impair hand function and balance. Dorsal fracture patterns in particular may disrupt joint stability, leading to malunion, stiffness, and post-traumatic arthrosis. Mobility of the PIP joint is critical for functional grip. In this study, the clinical outcomes of hemihamate arthroplasty in the treatment of post-traumatic PIP joint arthrosis were evaluated.

Material & Methods: A retrospective analysis was performed on 5 patients who underwent surgery in our clinic for arthrosis secondary to PIP joint trauma between January 2023 and February 2025. The mean age was 58 years (40–64).

Arthrosis involved the left D3 in two cases, left D2 in one case, right D2 in one case, and right D3 in one case; the latter patient also had an accompanying mallet deformity. All patients were treated with hemihamate osteochondral autograft arthroplasty. Postoperative joint range of motion (ROM), pain (VAS score), complications, and functional outcomes were recorded during follow-up.

Results: Full passive motion was achieved intraoperatively in all patients. The mean hospital stay was 5 days (3–7). No early postoperative complications were observed. The mean follow-up period was 9 months. All patients showed marked improvement in pain, grip function, joint balance, and ROM postoperatively. No major donor-site morbidity was observed. Conclusions: Hemihamate arthroplasty is a reliable option for the treatment of post-traumatic PIP joint arthrosis. With a low complication rate, this technique contributes to preservation of joint mobility, hand balance, and functional recovery. Larger case series and long-term follow-up studies are needed to further support these results.

A-0815 DOES VIBRATION REDUCE PAIN DURING WALANT ANESTHESIA? A RANDOMIZED CONTROLLED TRIAL

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Introduction: The WALANT (Wide Awake Local Anesthesia No Tourniquet) technique provides excellent intraoperative assessment of tendon balance and hand function while avoiding sedation and tourniquet discomfort. However, local infiltration pain remains a limiting factor affecting patient comfort and cooperation. According to the gate-control theory, concurrent activation of non-nociceptive mechanoreceptors may reduce the transmission of pain impulses at the spinal level. Mechanical vibration could therefore restore a temporary sensory balance between nociceptive and tactile input, decreasing perceived pain during injection. This study aimed to quantify the analgesic potential of vibration during WALANT anesthesia and to examine whether its effect is consistent across surgeons and common hand procedures.

Aim: To determine whether the application of vibration during local anesthetic infiltration reduces pain perception in WALANT procedures and whether this effect persists after adjusting for inter-operator variability.

Material & Methods: A prospective randomized controlled trial was conducted on 129 consecutive adult patients undergoing elective hand surgery between May and September 2025. Participants were randomized into two groups: vibration-assisted anesthesia ($n = 56$) and standard anesthesia without vibration ($n = 73$). The vibration device used was a commercially available facial massager (Qmed 3D Face Massager, model 03-9314, EAN 5901780446031). According to the manufacturer, the device produces approximately 6 000 oscillations per minute (~ 100 Hz) using a single AA battery-powered DC motor; no independent data were available for vibration amplitude or resultant energy, although the expected output is estimated at ~ 0.1 J/s under ideal assumptions. The most frequent procedures included carpal tunnel release, trigger finger release, and limited fasciectomy for Dupuytren's disease. Pain intensity during anesthetic infiltration was rated on a 10-point visual analogue scale (VAS). Data on procedure type and surgeon were recorded for statistical analysis using non-parametric tests and a mixed-effects linear model with operator as a random factor.

Results: Mean VAS scores were significantly lower in the vibration group (1.75 ± 1.86) compared with the control group (2.77 ± 2.06 ; $p = 0.0029$, Mann–Whitney U). Surgeon-related variability was significant ($p = 0.0004$, Kruskal–Wallis test). However, in the mixed-effects model vibration remained an independent predictor of reduced pain perception ($\beta = -0.85$, $p = 0.014$). The estimated effect size corresponded to a small-to-moderate but clinically relevant analgesic improvement. No adverse effects were observed.

Conclusions: The use of vibration during local anesthetic infiltration in WALANT significantly reduces perceived pain

intensity, independently of the operating surgeon. By modulating sensory inflow, vibration temporarily re-establishes a functional balance between nociceptive and mechanosensory pathways, improving comfort and cooperation during awake hand surgery. This simple, low-cost, and safe adjunct represents a practical refinement of WALANT technique, aligning with the concept of maintaining sensory balance for optimal hand function.

A-0816 THE IMPACT OF CARPAL TUNNEL SYNDROME ON DAILY LIFE: A SINGLE-CENTER PATIENT-DERIVED QUESTIONNAIRE STUDY

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Introduction: Carpal Tunnel Syndrome (CTS) is one of the most common peripheral nerve entrapment disorders, characterized by the compression of the median nerve as it passes through the carpal tunnel in the wrist. This condition affects approximately 1-5% of the general population and can lead to a variety of symptoms, including pain, numbness, tingling, and weakness in the affected hand, significantly affecting the quality of life and functional capabilities of those affected.

Aim: This study aims to assess the severity of symptoms associated with Carpal Tunnel Syndrome among patients undergoing surgical intervention. Through a comprehensive survey, we evaluate the intensity of these symptoms and their impact on daily life, with a focus on identifying factors that may influence treatment outcomes.

Material & Methods: This retrospective study involved 1539 patients who underwent Carpal Tunnel Release between 2021 and 2025 at the Plastic and Hand Surgery Department of St. Jadwiga Śląska Hospital in Trzebnica, Poland. The patients group comprised of 1060 females and 479 males. A structured questionnaire was administered to a randomized group of 300 patients to assess demographic details (age, sex, dominant hand, occupation) and specific symptoms related to CTS.

Results: 146 of questioned patients have returned the completed survey. Carpal tunnel syndrome was more frequently diagnosed in women (68,8%) with an average duration of symptoms of 31.5 months (range: 2 months to 10 years). The cohort included 108 physical workers and 38 intellectual workers, with mean age of participants being 61 years (range: 28 to 89 years). Diagnosis was primarily based on electrophysiological studies (95,2%), with only a few cases of diagnoses by ultrasound, MRI or clinical presentation.

The most frequently reported and burdensome symptoms were sensory disturbances and pain occurring at night. 88% of patients reported significant sleep disruption, with a mean nightly level of pain measured with Visual Analog Scale (VAS) score of 6.76. Among daily activities most frequently reported difficulties included opening jars and holding a phone longer than 5 minutes.

Prior to surgical intervention, 39% of patients attempted conservative treatment, primarily involving physiotherapy and anti-inflammatory medications. Patient feedback indicated that conservative treatment was effective to a slight to moderate extent (15,8%), while most patients found it completely ineffective (84,2%). Additionally, the 19,9% of the patient group had previously undergone surgical treatment on the opposite hand, with a median interval since their procedure of 4 months. Post-operative assessments showed that most patients (79,3%) reported significant to complete improvement, indicating greater efficacy of surgical treatment compared to conservative methods. Currently, the study remains ongoing.

Conclusions: This study confirms that Carpal Tunnel Syndrome significantly impacts daily life, with many patients finding conservative treatments ineffective, while surgical intervention offers substantial improvement.

A-0817 3D PRINTED TFCC SUPPORT SPLINT: A PILOT STUDY

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Introduction: Triangular fibrocartilage complex (TFCC) lesions are a common cause of ulnar sided wrist pain and functional limitation. Splinting is a frequently used part of conservative care, but in regular use, prefabricated wrist splints are often preferred to custom made ones. The production of 3D printed orthoses customized to individual patients allows for targeted stabilization while improving comfort and wearability. This pilot study aimed to evaluate the short term clinical effects of an innovative 3D Printed TFCC Support Splint designed to stabilize the distal radioulnar joint (DRUJ) while maintaining functional wrist mobility.

Aim: To assess the preliminary effects of a customized 3D printed TFCC support splint on pain and grip strength in individuals with TFCC lesions after a 4 week use period.

Material & Methods: Five individuals (3 males, 2 females; mean age 35 years; mean height 166.4 cm; mean body weight 68.2 kg) with clinically and radiologically confirmed TFCC lesions were included. For each participant, a custom 3D model of the wrist was generated, and a flexible thermoplastic polyurethane (TPU) splint was fabricated to provide targeted DRUJ stabilization. A patient specific TFCC support splint was 3D printed using fused deposition modeling (FDM) in flexible TPU with a uniform 1.6 mm thickness (layer height 0.4 mm; infill 100%) and fastened to the wrist using Velcro. The CAD geometry was customized to the individual wrist to achieve selective DRUJ stabilization without over constraining functional motion. Participants were instructed to wear the splint during daily activities, except during hygiene or rest periods, for 4 consecutive weeks. No concurrent physiotherapy or pharmacological interventions were administered. Pain was assessed using the Visual Analog Scale (VAS), and hand grip strength was quantified using the Grip Strength Ratio (affected/contralateral $\times 100$) measured with a Jamar dynamometer. Evaluations were conducted at baseline and after 4 weeks of splint use.

Results: All five participants completed the study without adverse events. The mean pre treatment VAS score was 4.6, which decreased to 1.6 post treatment, representing an average reduction of 3.0 points ($\approx 65\%$) in pain. The mean Grip Strength Ratio increased from 60.2% to 77.4%, corresponding to an improvement of 17.2 percentage points ($\approx 29\%$) compared with the contralateral side. Individual improvements were consistent across participants. Subjective feedback indicated high comfort, good adherence to use, and no skin irritation or motion limitation during functional activities.

Conclusions: This pilot study suggests that the 3D Printed TFCC Support Splint may provide effective pain reduction and functional enhancement in grip strength after short term use. The patient specific 3D printed design achieved selective stabilization of the distal radioulnar joint without over restricting wrist motion. These promising results highlight the feasibility of 3D printed orthotic interventions in TFCC management. Future randomized controlled trials with larger sample sizes are warranted to confirm these preliminary outcomes and to optimize design parameters for clinical implementation.

A-0818 PERCUTANEOUS NEEDLE FASCIOTOMY IN DUPUYTREN'S DISEASE - UNICENTER STUDY

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Introduction: Dupuytren's disease is a fibroproliferative disorder characterized by the formation of nodules and cords in the palmar fascia, leading to progressive digital flexion contractures. While open fasciectomy has been the traditional

treatment, less invasive techniques like percutaneous needle fasciotomy (PNF), first described by Lermusiaux and Debeyre in 1980, have gained popularity due to their minimally invasive nature and quicker recovery times.

Aim: This study aims to evaluate the efficacy, complications, and recurrence rates of percutaneous needle fasciotomy in the treatment of Dupuytren's contracture, assessing both immediate outcomes and long-term results.

Material & Methods: We conducted a retrospective analysis of patients treated with PNF for Dupuytren's contracture. A total of 138 patients were initially treated, with 123 available for re-evaluation at a 5-year follow-up. The procedure involved the percutaneous sectioning of the pathological cords using a needle to release the contracture. Clinical assessment included the measurement of passive extension deficit and patient satisfaction. Results were categorized as excellent/good based on the degree of contracture correction.

Results Immediate postoperative evaluation showed excellent or good results in 81% of the cases. At the 5-year follow-up, 69% of the patients maintained excellent or good outcomes. The recurrence rate at 5 years was 50.4%. Complications were generally minor, including 20 transient skin lesions, 3 cases of digital dysesthesia, and 3 infections. No tendon injuries were reported. When compared to limited fasciectomy, PNF showed a higher recurrence rate (65% vs. recurrence rates in literature for fasciectomy) but offered significant advantages in terms of quicker recovery and lower morbidity. PNF is a viable alternative for patients seeking a less invasive option or to delay more extensive surgery.

A-0819 THE IMPORTANCE OF A FUNCTIONAL APPROACH IN HAND THERAPY: A CASE OF ULNAR NERVE INJURY IN A VIOLINIST

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Introduction: Peripheral nerve injuries of the hand in musicians represent a major clinical and occupational challenge due to the highly specialized motor and sensory requirements of instrumental performance. Optimal management demands not only precise surgical repair but also a rehabilitation strategy that prioritizes functional recovery specific to the musician's professional needs. This case highlights the role of targeted functional rehabilitation following an ulnar nerve injury in a violinist.

Case Description / Methods: A 40-year-old female professional violinist presented with a complete laceration of the ulnar nerve and ulnar artery at the wrist level of the left hand. Immediate microsurgical repair was performed. Postoperatively, she followed a four-week program of controlled self-mobilization.

Subsequently, she entered a structured Hand Therapy program under the supervision of a hand therapist, attending sessions three times per week. The patient was instructed to maintain mental engagement with violin playing through imagery-based practice to support cortical representation of the injured limb and minimize functional deconditioning. Initially, the patient exhibited significant kinesiphobia, which gradually improved through therapeutic education and guided exposure. At eight weeks post-injury, she began reintroducing professional-level violin practice using a light ring splint for the ring and little fingers. Practice duration started at 15 minutes and progressively increased, while formal therapy continued once to twice weekly.

Results: At five months, the patient achieved professional-level finger activity with splint support. By seven months, she returned to violin performance without orthotic assistance. At eleven months, mild residual weakness in little-finger adduction and partial sensory recovery persisted, but neither affected her daily function nor her ability to perform professionally.

The patient reported that her musical background and familiarity with fine motor control enhanced her ability to understand and execute functional therapeutic tasks, supporting a successful rehabilitation trajectory.

Conclusion: This case demonstrates the critical importance of an individualized, function-driven rehabilitation approach for musicians with complex hand injuries. Early cognitive engagement, gradual reintroduction of instrument-specific tasks, and collaboration between surgeon, therapist, and patient substantially contribute to achieving optimal outcomes. Functional rehabilitation should be considered a central component in the management of upper-extremity nerve injuries in high-demand performers.

A-0820 MANAGEMENT OF THE UPPER LIMB IN THE NON-FUNCTIONAL SPASTICITY PATIENT: CURRENT PRACTICE IN BULLSS

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Introduction: Spasticity can present on a varying spectrum, from mild symptoms in a functionally able patient to complete non-functioning limb(s). The Birmingham Upper and Lower Limb Spasticity Service (BULLSS) is using a standardised method of assessing and managing Spasticity patients.

Aim: In the non-functioning upper limb spasticity sub group, surgery is advocated to improve the position of the limb for ease of dressing/hygiene/pain relief and cosmesis. This study aims to present our outcomes for the non-functioning subgroup.

Material & Methods: Following assessment and clinical findings, surgical intervention options include pectoralis release, biceps/brachialis release/lengthening, pronator teres release, wrist arthrodesis, flexor tendon lengthening/superficialis to profundus transfer and FPL lengthening.

The BULLSS standardised method has been utilised since 2011. Outcome measure included the ARM-A (arm activity) questionnaire filled in by patient or carer pre and post operation(s). Surgical and medical complications of each patient were also recorded.

Results: From 2011-2019 a total of 111 non-functioning patients (ages 16-93) underwent surgical intervention with a total of 430 procedures (10 bilateral procedures). 103 patients had all procedures during one operation, remaining 8 had further surgery. 71 patients underwent a regional block, 50 had general anaesthesia.

Most common procedure was flexor lengthening/superficialis to profundus transfer (90), followed by FPL lengthening (59), brachialis/biceps lengthening/release (54), wrist releases (48) and wrist arthrodesis (45). Most common indication for surgery was hygiene followed by positioning. All patients had improvement of hygiene/pain/ positioning or cosmesis with 14 patients gaining some function of the arm. There were 9 wound complications and 3 medical complications.

Conclusions: The BULLSS standardised method for managing non-functional spastic patients in a relatively consistent manner shows good outcomes with clinical improvement of ARM-A scoring without serious surgical complications.

A-0821 SERIAL CASTING IN PIP JOINT CONTRACTURE: REVISITING A FORGOTTEN ART

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Introduction: Within the field of hand surgery, traditional techniques sometimes remind us of the elegance of simplicity. Serial casting for PIP joint contracture represents one of these enduring methods. By maintaining the joint at its elastic limit

under gentle, constant tension, serial casting allows living tissue to remodel gradually without provoking inflammation or fibrosis. This biological adaptation—achieved through steady positioning rather than forceful stretching—restores motion while preserving tissue balance and integrity. Given that surgically recreating extensor–flexor harmony can be challenging in certain post-traumatic patterns, a structured casting protocol may serve as a reasonable first-line option while soft tissues remain biologically responsive. When combined with relative motion flexion (RMF) splinting and principles of active redirection, casting may further support differential tendon glide and more physiologic extension patterns.

Aim: To illustrate the continued relevance of serial casting in post-traumatic PIP joint contracture through two cases treated with staged serial casting, RMF splinting, and active redirection.

Material & Methods: Two patients with post-traumatic PIP joint contracture were managed using staged serial casting, with the DIP joint deliberately left free to permit active redirection and facilitate distal lateral band migration. RMF-guided mobilization and active redirection exercises were initiated after casting.

Case 1: An 18-year-old male who sustained a volar PIP dislocation reduced at an outside facility and presented two months later with persistent stiffness, a positive Elson test indicating central slip injury, and a flexion posture. A total of 8 serial casts were applied.

Case 2: A 26-year-old male with a pseudoboutonnière deformity following a volar lip fracture and a 55° PIP flexion contracture. A total of 6 serial casts were applied.

Contracture angles were documented at each casting stage, at transition to RMF splinting, and at 6-month follow-up. Functional outcomes were assessed using the QuickDASH.

Results: Case 1: At the transition from casting to RMF, the PIP contracture had improved to 10°, and this value was maintained at the 6-month follow-up, with a QuickDASH score of 0.

Case 2: Transition-stage contracture improved to 20°, and this angle remained stable at 6 months, with a QuickDASH score of 9.1.

In both patients, the extension gains achieved through casting were preserved without regression.

Conclusions: Serial casting remains a timeless method that restores motion through patience, precision, and respect for tissue biology. When integrated with RMF splinting and active redirection, it restores extension while preserving the health of uninvolved tissues. Honouring this technique reflects enduring principles of balance and care that continue to guide modern hand surgery.

A-0823 MIXED AND MOTOR - EXPERIENCE OF ALLOGRAFT RECONSTRUCTION IN COMPLEX PERIPHERAL NERVE REPAIR

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Introduction: Peripheral nerve injuries pose a major reconstructive challenge when repair is hindered by large nerve gap, donor site morbidity, or limited autograft availability. In accordance with evolving guidelines, processed nerve allografts are increasingly being utilised as alternatives to autografts, especially for digital and short-gap nerve discontinuities; however, their utility in complex mixed and motor nerve injuries is less well established. This series showcases the experience of a UK tertiary peripheral nerve unit, and presents "real-life" outcomes and reasoning behind allograft use for a spectrum of nerve injuries.

Objective: The objective of this case series is to assess the safety and effectiveness of processed nerve allografts on mixed and motor nerve injuries treated in a tertiary referral setting. Outcomes were assessed to guide selection of appropriate

patients and increase the understanding of the applicability of allograft in complex nerve repair.

Materials & Methods: A review of all patients who underwent processed nerve allograft reconstruction of peripheral nerve injuries at the Birmingham peripheral nerve unit between June 2016 and July 2019 was undertaken with a minimum follow-up of 12 months. Data obtained included patient demographics, injury mechanism, nerves involved, gap length (15–140mm), and time interval to repair. The main outcomes were sensory (S3) and motor (M3) recovery, pain relief based on a visual analogue scale (VAS), and secondary surgery or complications.

Results: A total of 32 nerves were reconstructed with allografts. Mechanism of injury was predominantly traumatic and iatrogenic injuries. After excluding cases with incomplete follow-up or combined auto/allo-graft techniques, 23 mixed nerve and 3 motor nerve repairs were analysed. The goals of repair included either treatment of pain, in the case of neuroma, or restoration of function. Of the mixed nerves: six of the repairs were aimed at pain recovery, four were aimed at sensory recovery and 13 were aimed at Motor and sensory recovery. The goal of repair of the 3 motor nerves was motor recovery. Failure to achieve the goal of repair was seen in five of the six nerves repaired for pain, in eleven of the thirteen repairs aimed at motor and sensory recovery, in two of the four repairs aimed at sensory recovery and in one of the three motor nerve repairs. Higher rates of partial or failed recovery were seen when gaps were longer or injuries more complex. Eleven patients required additional interventions for persistent pain or functional deficits.

Conclusions: This case series shows that while allografts may be successful in repairing digital nerves, it has variable success with more complex reconstruction, including mixed and motor nerve repairs, and, as such, correct patient selection remains paramount. This is in line with some more recent literature, which has shown favourable allograft outcomes for sensory nerves and short defects, but little success for complex reconstruction strategies. For this reason, robust clinical governance, patient counselling, and auditing of outcomes are important as the use of allograft expands. Future studies should aim to better delineate the indications for allograft and, in doing so, improve long-term outcomes across all forms of nerve injury.

A-0824 FACTORS INFLUENCING FUNCTIONAL OUTCOMES FOLLOWING SURGICAL TREATMENT OF TYPE II FRACTURES OF THE PROXIMAL RADIUS

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Introduction: In 1950 Jeffrey published an article, in which he classified pediatric radial neck fractures into several types according to the proposed mechanism of injury and dislocation of the proximal fragment. Type 2 was a fracture in which the radial epiphysis was rotated through 90 degrees and left separated beneath the capitellum. With Jeffrey type 2 fractures exceedingly rare, very few such cases have been reported in the literature, with 15-33% reported unsatisfactory outcomes following operative treatment.

Aim: Our aim was to evaluate the functional outcomes of surgical treatment of Jeffrey type II fractures and identify risk factors leading to poor clinical results.

Materials and methods: This was a monocentric, retrospective study including 7 patients who underwent open reduction and K-wire fixation for a Jeffrey type 2 fracture between 2015-2024. Mean age in the cohort was 8.5y (7-10y), with 71% (n=5) acute injuries and 29% (n=2) of cases presenting late (41 and 93 days since initial trauma respectively). Functional outcome was assessed using the QuickDASH outcome measure and ROM (range of motion) measurements.

Results: At final check-up all 5 patients in the acute group had no complications, a QuickDASH score of 0 and full range of motion. The 2 cases with delayed treatment had a mean QuickDASH score of 7 and mean loss of ROM of 45.6°.

Conclusions: Time to treatment was the most important factor influencing functional outcome in Jeffrey type II fractures of the proximal radius in children.

Keywords: pediatric, proximal radius, elbow, trauma, fracture

A-0825 TREATMENT OF SCAPHOID MALUNION WITH NONVASCULARIZED BONE GRAFT FROM THE RADIUS - UNCENTER RETROSPECTIVE STUDY

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Introduction: Scaphoid malunion is a complex condition that can result in persistent pain, carpal instability, and degenerative arthritis of the wrist. Achieving bony union and restoring the correct carpal geometry are the primary goals of surgical intervention. While vascularized grafts are an option for selected cases, nonvascularized bone grafting remains a widely used and effective technique. This study explores the utility of harvesting bone graft from the distal radius to treat this pathology.

Aim: The purpose of this study is to evaluate the efficacy of treating scaphoid malunion using a nonvascularized bone graft harvested specifically from the distal radius bone.

Material & Methods: We conducted a retrospective study covering the period from 2012 to 2022. The study population consisted of 32 patients diagnosed with scaphoid malunion and treated surgically with open reduction and internal fixation combined with a nonvascularized bone graft harvested from the ipsilateral distal radius. The primary outcome measures included the rate of radiographic union and the time required for bone consolidation.

Results: The surgical treatment demonstrated a high rate of success. Bone union was achieved in 31 out of the 32 patients, corresponding to a union rate of 96.9%. The average time to consolidation was 9.6 weeks. These results indicate that the use of nonvascularized bone graft from the distal radius is a reliable and effective method for the management of scaphoid malunion, providing high union rates and relatively short consolidation times

A-0826 THE UPSIDE-DOWN FASCIAL FLAP: A UNIVERSAL TECHNIQUE FOR THIN, VASCULARIZED COVERAGE IN UPPER LIMB RECONSTRUCTION

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Introduction: Thin, well-vascularized soft-tissue coverage is essential in upper-extremity reconstruction, particularly over exposed tendons, nerves, or bony structures. Fascial flaps offer excellent pliability and graft acceptance, yet their natural surface polarity is rarely utilized. The upside-down fascial flap is a 180° rotation of a perforator-based fascial flap. positions the native deep, smooth fascial surface externally, creating an optimal gliding and grafting substrate. This concept allows surgeons to enhance outcomes without introducing new donor sites.

Aim: This conceptual technical report outlines the anatomical rationale, harvesting technique, and clinical indications of the upside-down fascial flap. The fascia is elevated on its perforators, rotated 180°, and inset with the deep glistening surface outward. The technique was applied to defects of the hand, wrist, forearm and lower limb requiring ultra-thin vascularized coverage. The aim of this study was to evaluate the clinical reliability, complication profile, and functional

outcomes of the upside-down fascial flap in upper-limb reconstruction, specifically assessing flap viability, graft integration, and tendon-gliding quality.

Material & Methods: A consecutive series of 11 patients underwent reconstruction using the upside-down fascial flap. Donor sites included the radial forearm, lateral arm, and anterolateral thigh. The fascia was harvested on its perforator system and rotated 180° to expose the deep surface outward. Clinical evaluation included flap viability, graft take, complications, and early functional recovery based on tendon gliding and range of motion. Minimum follow-up was 3 months.

Results: All 11 flaps survived, with 2 cases of partial flap necrosis that healed secondarily without the need for flap revision. Three patients required a repeat split-thickness skin graft due to partial graft loss. In all remaining cases, graft take was complete. The inverted deep fascial surface provided a smooth and vascularized bed, reducing adhesion formation and supporting early mobilization. All patients achieved satisfactory functional recovery with improved tendon gliding and stable soft-tissue contour. Donor-site morbidity was minimal.

Conclusions: The upside-down fascial flap represents a simple yet biologically meaningful refinement of classical fascial-flap reconstruction. By leveraging the intrinsic polarity of fascia, surgeons can achieve superior gliding surfaces while preserving thin, durable vascularized coverage.

A-0827 REPAIR OF THE ULNAR COLLATERAL LIGAMENT OF THE THUMB METACARPOPHALANGEAL JOINT USING MITEK ANCHORS

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Introduction Acute rupture of the ulnar collateral ligament (UCL) of the thumb metacarpophalangeal (MCP) joint, often referred to as "skier's thumb," is a frequent injury leading to instability and weakness of pinch grip. While conservative treatment is reserved for partial tears, complete ruptures, especially those with a Stener lesion, require surgical repair. The use of bone anchors has simplified the reattachment of the ligament to the phalanx.

Aim The objective of this study is to assess the clinical and functional results of UCL repair using Mitek suture anchors in patients with acute unstable UCL injuries.

Material & Methods We reviewed patients who underwent surgical repair of the UCL using Mitek anchors. The indication for surgery was clinical instability of the thumb MCP joint (more than 30 degrees of laxity in flexion or extension compared to the contralateral side) or the presence of a Stener lesion confirmed by imaging. The surgical technique involved a direct approach to the MCP joint, identification of the torn ligament, and reattachment to the base of the proximal phalanx using a Mitek anchor. Postoperative management included immobilization followed by a rehabilitation protocol. Outcomes measured were joint stability, range of motion, pinch strength, and return to activity.

Results The repair technique using Mitek anchors provided stable fixation and allowed for early mobilization. At the final follow-up, all patients achieved a stable MCP joint with no recurrent instability. Range of motion was comparable to the uninjured side, although a slight loss of flexion was noted in some cases. Pinch strength was restored to near-normal levels. Complications were rare, with no cases of implant failure or infection reported. This technique offers a reliable and reproducible method for UCL repair, ensuring good functional recovery and patient satisfaction.

A-0828 WIDE AWAKE LOCAL ANAESTHETIC NO TOURNIQUET TECHNIQUE FOR FLEXOR TENDON INJURIES IN A DISTRICT GENERAL HOSPITAL: BREAKING THE BARRIERS

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Introduction: Wide-awake Local Anaesthetic No tourniquet technique (WALANT) is a widely used practice of performing hand surgery using tumescent local anaesthetic with adrenaline for pain relief and vasoconstriction, without tourniquet or sedation. Popularised first by Dr Don Lalonde in 2005, it can be implemented across most areas of hand surgery, with the greatest benefit for awake flexor tendon repair.

WALANT has been shown to have comparative or better functional outcomes in flexor tendon repairs for patients and better range of movement (ROM), compared to general (GA) or regional anaesthesia (RA)¹⁻³. Patients are able to perform active ROM intraoperatively and studies have shown they are more likely to comply with their physiotherapy as a result.⁴

Aim: To assess the number of flexor tendon repairs under WALANT within a single plastic surgery unit, of a district general hospital, and compare local practice with national British Society of Hand Surgery (BSSH) guidelines.⁵

Material & Methods: Data was retrospectively collected, to identify patients between 1/1/25 – 31/5/25 who underwent flexor tendon repairs. Primary outcome was proportion of eligible patients who were offered for WALANT and if they went on to have WALANT or GA/RA. Secondary outcomes were to assess barriers to performing WALANT in the unit and compliance of current practice to the BSSH WALANT guidelines. The audit was registered with the local quality improvement team.

Results: 20 patients had traumatic flexor tendon injuries in this time frame, 3 of which were repaired under WALANT, 1 with regional anaesthetic and the rest under general anaesthetic.

Based on BSSH guidelines 13/20 patients would have been suitable for WALANT. 10 eligible patients had traditional anaesthetic instead.

Conclusions: This audit confirms underutilisation of WALANT for flexor tendon repair in accordance with the BSSH guidelines. The following recommendations were made in response: creation of a departmental guideline for eligibility for WALANT, a patient leaflet and appropriate local anaesthetic with haemostatic agents and reversal have been made more readily accessible in theatres. It is hoped on reaudit these changes will have cost-effective implications, better patient outcomes and streamline trauma lists for better theatre efficiency.

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A-0829 RETROSPECTIVE COHORT ANALYSIS OF RISK FACTORS IN DUPUYTREN'S CONTRACTURE: THE EFFECT OF DIABETES, SMOKING, AND FAMILY HISTORY IN 142 PATIENTS

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Aims: The role of genetic and environmental factors in the etiology of Dupuytren's contracture (DC) is controversial. This retrospective cohort study aimed to investigate the effects of diabetes, smoking, and family history on disease severity, bilateral involvement, and joint distribution in 142 patients with DC followed at a single institution between 2022 and 2025. **Method:** All patients diagnosed with DC in the hand surgery clinic between January 2022 and October 2025 (n=142 patients, 189 hands) were retrospectively reviewed. **Inclusion:** Clinical Tubiana staging, minimum 6-month follow-up. **Exclusion:** Trauma, rheumatoid arthritis, previous treatment. **Demographic data,** diabetes (HbA1c $\geq$ 6.5%), smoking (pack-years), family history (1st-degree relative), Tubiana stage, bilateral involvement, and MCP/PIP distribution were compiled from electronic files. **Statistics:** Chi-square, Mann-Whitney U, logistic regression (OR, 95% CI).

Results: Mean age 63 $\pm$ 10 years, 79% male. Diabetes 31% (n=44), smoking 45% (n=64, median 22 pack-years), and family history 38% (n=54). In the diabetic group, the rate of Tubiana stage III–IV was 52% vs. 30% (p=0.008), and bilateral involvement 68% vs. 43% (p=0.003). PIP joint involvement in those with $\geq$ 20 pack-years of smoking was 61% vs. 39% (p=0.012). The presence of a family history of bilateral disease had an OR of 3.5 (95% CI 2.1–5.9). In multivariate analysis, diabetes (OR 2.4, p=0.01) and family history (OR 3.1, p<0.001) were independent risk factors for advanced disease; smoking increased PIP involvement (OR 1.9, p=0.03).

Conclusion: In the 2022–2025 cohort, diabetes and family history were strong predictors of more severe and bilateral disease in DC. Smoking increases PIP joint involvement. These data provide the clinical basis for early screening and lifestyle interventions in high-risk patients.

Keywords: Dupuytren's contracture, risk factors, diabetes, smoking, family history, retrospective cohort

A-0830 ARTHROSCOPIC DECOMPRESSION OF THE LUNATE IN STAGE IIIB KIENBÖCK DISEASE: FUNCTIONAL AND CLINICAL OUTCOMES IN A CONSECUTIVE COHORT

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Introduction: Stage IIIB Kienböck disease is characterized by lunate collapse, altered carpal biomechanics, and significant functional impairment. While open procedures remain the most commonly recommended approach for advanced stages, arthroscopic decompression has gained interest as a minimally invasive technique aimed at reducing intraosseous pressure, alleviating pain, and preserving wrist function. Evidence supporting its use in IIIB disease, however, remains limited.

Aim: The aim of this study was to assess the clinical effectiveness, pain reduction, functional recovery, and return-to-activity profile following arthroscopic decompression of the lunate in patients with Lichtman stage IIIB Kienböck disease, evaluating whether this minimally invasive approach can provide meaningful improvement despite the advanced stage of disease.

Material & Methods: A retrospective review of 9 patients was conducted on patients who underwent arthroscopic lunate decompression for stage IIIB Kienböck disease. Clinical parameters included pre- and postoperative VAS pain scores, wrist range of motion (flexion–extension and rotation arcs), grip strength, and time to return to work, sport, and daily activities. Subjective postoperative satisfaction, including the question “Would you undergo the procedure again?”, was also recorded. Follow-up ranged from 5 to 28 months.

Results: nine patients met the inclusion criteria. All experienced substantial postoperative pain relief, with VAS decreasing from moderate levels preoperatively to 0–3 at follow-up in most cases. Flexion–extension arcs were preserved or improved, typically reaching 60–90° extension and 20–70° flexion. Grip strength recovered to 80–90% of the contralateral side. Return to work varied from 6 days to 4 months, depending on occupational demands. The majority resumed sports or pre-injury activities, though some reported mild discomfort during high-load wrist extension. Importantly, all patients stated they would choose the procedure again, reflecting high satisfaction.

Conclusions: Arthroscopic lunate decompression appears to be a reliable, minimally invasive, joint-preserving option for stage IIIb Kienbock disease. Despite the advanced pathology, patients achieved significant pain reduction, functional improvement, and early return to activity. The technique may represent an effective alternative for selected IIIb cases, though larger prospective studies are warranted to define its long-term role in the treatment algorithm.

A-0831 MODULAR TOTAL WRIST REPLACEMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction: Total wrist arthroplasty is viable treatment option for the rheumatic wrist. The procedure has the advantage of preserving wrist motion but has historically had unacceptable complication rates. The current generation implants represent significant improvements and have acceptable complication rates.

Aim: To evaluate clinical outcomes and complications in patients with rheumatoid arthritis who underwent modular total wrist replacement.

Material & Methods: We conducted a retrospective follow-up study of all patients with rheumatoid arthritis of the wrist joint who underwent total wrist arthroplasty between 2023 and 2024. A total of 44 patients were included. Residual pain, preoperative and postoperative range of motion (ROM), grip strength, radiographic changes, short-term complications, and reasons for revision or failure were assessed. Functional outcomes were evaluated using the DASH score

Results: The follow-up period ranged from 12 to 24 months. No wound-healing problems or early/late postoperative infections were observed. One prosthetic dislocation occurred 1 year postoperatively, and one postoperative fracture of the third metacarpal was recorded. There was no significant difference between patients with and without distal ulna resection in cases of distal radioulnar joint destruction. The most frequent complication was recurrence of ulnar deviation of the wrist, observed in 11 patients (25%); none of these patients required revision surgery. At final follow-up, the mean Mayo Wrist Score improved from 40.12 preoperatively to 61.56, and the mean DASH score improved from 42.50 to 20.46 points. The mean postoperative flexion–extension arc was 55°, with an average flexion–extension ROM of 68%. Overall, pain intensity, clinical scores, and radiological parameters improved compared with baseline.

Conclusions: Modular total wrist replacement in patients with rheumatoid arthritis provides satisfactory pain relief and functional wrist motion, with improvement in clinical and radiographic outcomes. The most relevant complication in this cohort was recurrence of ulnar deviation of the wrist, occurring in approximately 25 % cases

A-0832 PREVENTION OF POST-SURGICAL ADHESIONS AFTER EXTENSOR TENDON REPAIR USING MATRIDERM®: A PROSPECTIVE RANDOMIZED STUDY

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INTRODUCTION: Extensor tendon injuries of the hand are common and often require surgical repair to restore function. Despite advances in surgical techniques, post-operative adhesion formation remains a significant complication, frequently leading to impaired tendon gliding, stiffness, reduced range of motion, and the possible need for secondary procedures such as tenolysis. Barrier materials have been investigated as potential strategies to limit adhesions by reducing direct contact between the repaired tendon and surrounding tissues. MatriDerm®, a three-dimensional collagen–elastin matrix widely used in reconstructive surgery, has shown promising experimental evidence for modulating fibroblast proliferation and supporting organized tissue regeneration. However, clinical data regarding its application in extensor tendon repair remain limited.

AIM: The primary aim of this study was to evaluate the safety and feasibility of MatriDerm® when applied around repaired extensor tendons. The secondary aim was to assess its efficacy in reducing post-surgical adhesions and improving functional outcomes compared with standard repair alone.

MATERIALS & METHODS: This prospective, randomized study enrolled 60 adult patients presenting with acute extensor tendon injuries of zones IV–VII. Patients were randomized into two equal groups:

- MatriDerm group (n = 30): standard tendon repair plus application of a tailored MatriDerm® sheet wrapped around the tendon;

- Control group (n = 30): standard tendon repair alone.

All repairs were performed using a Kessler core suture with non-resorbable 2-0 monofilament and continuous epitendinous resorbable sutures. Post-operative immobilization was maintained for three weeks, followed by guided active and passive mobilization. Follow-up evaluations occurred at 1, 2, 3, and 6 months and included range of motion (MP/PIP/DIP), scar adhesion, Buck-Gramcko II score, Michigan Hand Questionnaire, and complication rates (infection, algodystrophy, tendon rupture, need for tenolysis).

RESULTS: All patients completed the 6-month follow-up. No MatriDerm-related complications (infection, foreign-body reaction, wound dehiscence) were observed.

The MatriDerm group demonstrated slightly but consistently superior functional outcomes:

- Range of motion: greater mean extension and flexion recovery at all time points, reaching statistical significance at 3 and 6 months ($p < 0.05$);

- Scar adhesion: clinically appreciable reduction in palpable or symptomatic adhesions;

- Need for tenolysis: lower in the MatriDerm group;

- Functional scores: higher Buck-Gramcko II and Michigan scores at 6 months;

- No differences were found regarding rates of algodystrophy or secondary tendon rupture.

CONCLUSIONS: The application of MatriDerm in extensor tendon repair appears to be safe, well-tolerated, and feasible, with no procedure-related complications. Although the differences were modest, the MatriDerm group showed better tendon gliding, reduced adhesion formation, and improved functional recovery compared with controls. These findings support the potential role of MatriDerm® as an adjunct in tendon surgery to optimize outcomes and reduce the likelihood of secondary procedures. Larger multicenter trials with longer follow-up are warranted to confirm these preliminary results.

A-0833 PEDIATRIC FLEXOR TENDON INJURIES IN ZONES I AND II: OPTIMAL TIMING FOR SECONDARY INTERVENTIONS AND STAGED RECONSTRUCTION

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Introduction: Flexor tendon injuries in children, particularly in Zones I and II are challenging for rehabilitation and treatment. After primary repair optimal timing for secondary procedures, e.g. tenolysis and staged reconstruction, regarding the age and developmental stage of the child, remain a subject of debate. Studies, such as Piper et al. (2019), Marques et al. (2014), and Al-Qattan (2015), have explored various treatment protocols, though consensus on the ideal timing for staged reconstructions in pediatric patients remains elusive.

Aim: This study aims to analyze the outcomes of secondary interventions after failed primary tendon repair and staged reconstruction in pediatric patients with Zone I and II flexor tendon injuries. Specifically, it seeks to determine the ideal timing for staged reconstruction and its relationship with the child's age and development.

Material & Methods: Clinical data from five pediatric patients between 2015 and 2025 were reviewed. The cases involved flexor tendon injuries to the thumb, index finger, and little finger after failed primary repair. Surgical interventions varied from secondary direct repair to staged reconstructions, with follow-up ranging from 6 months to 4 years. The primary outcome was the range of motion at the affected joints, assessed through both objective measurements and functional assessments.

Results: The results revealed that early secondary interventions and staged reconstruction, particularly in younger children (ages 4-10), led to better functional outcomes compared to longer delayed interventions. In cases where reconstruction was delayed beyond 1-2 years, a reduction in joint mobility and overall hand function was observed. Notably, children who underwent early tenolysis and tendon grafting showed improved flexibility and strength, whereas delayed reconstructions required more extensive rehabilitation efforts. Functional outcomes were particularly favorable in children with injuries to the thumb and index finger, with flexion-extension of the IP and MCP joints approaching normal ranges.

Conclusions: Our study suggests that early intervention and staged reconstruction in pediatric flexor tendon injuries may yield better functional outcomes. The timing of surgical reconstruction should consider both the child's developmental stage and the nature of the tendon injury. However, a larger patient cohort is necessary to further refine treatment protocols and establish more robust guidelines for the optimal timing of staged reconstruction, particularly in younger patients, to optimize both functional recovery and long-term hand function.

A-0834 NOVEL APPLICATION OF A VASCULARIZED FDS-BASED RPNI FOR RECONSTRUCTION OF PERIPHERAL SENSORY NEUROMAS AROUND THE WRIST

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Injury to the peripheral sensory nerves of the hand and wrist is common and may lead to painful neuroma formation, resulting in substantial functional impairment and reduced quality of life. Surgical management of neuromas in the distal forearm remains challenging due to complex regional anatomy and limited availability of suitable reconstructive targets. The Regenerative Peripheral Nerve Interface (RPNI) has emerged as a promising technique for neuroma treatment; however, conventional free muscle grafts depend on a well-vascularized recipient bed and may not survive in scarred

or fibrotic tissue. This study aimed to assess the feasibility and clinical efficacy of a Vascularized RPNI (V-RPNI) using the flexor digitorum superficialis (FDS) muscle as a viable motor target for the treatment of peripheral sensory neuromas around the wrist.

Surgical Technique: The distal forearm portion of the FDS muscle receives consistent perforators from the ulnar artery. During flap elevation, two to three perforators can typically be identified. The muscle flap may be elevated on a single perforator, providing a broad arc of rotation that enables coverage from the radial to the ulnar side of the distal forearm. The flap width can be tailored to match the diameter of the affected sensory nerve, allowing for precise interfacing.

Results: The mean follow-up period was 13 months. Neuromas involved the superficial branch of the radial nerve in five patients, the palmar cutaneous branch of the median nerve in two patients, and the dorsal branch of the ulnar nerve in one patient. The average preoperative visual analog scale (VAS) pain score was 7/10, which improved to 2/10 postoperatively, indicating a significant reduction in neuroma-related pain.

Conclusion: The FDS-based V-RPNI represents a reliable motor target for the management of peripheral sensory neuromas around the wrist. It offers several advantages: (1) accessibility to all major sensory nerves in the wrist region; (2) customizable flap dimensions based on nerve size; (3) robust vascularity of the distal FDS muscle; and (4) a wide arc of rotation, allowing coverage of neuromas in various anatomical locations. These features position the FDS V-RPNI as a promising first-line reconstructive option for symptomatic sensory neuromas of the wrist.

A-0835 LISFRANC-LIKE HAND INJURY: DISLOCATION OF 2ND–5TH CARPOMETACARPAL JOINTS

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Introduction: Multiple carpometacarpal (CMC) joint dislocations are exceptionally rare due to the strong ligamentous support and intrinsic stability of the CMC complex. When they do occur, they are typically the result of high-energy trauma. Anatomically, this pattern of injury parallels Lisfranc lesions of the foot, in which disruption of a tightly interwoven joint complex leads to instability and potential long-term functional impairment. Prompt recognition is therefore essential to avoid misdiagnosis and delayed treatment.

Aim: This case report aims to describe a rare dorsal dislocation of the second to fifth CMC joints and highlight its anatomical and clinical resemblance to Lisfranc-type injuries.

Material & Methods: A 50-year-old woman presented after a motorcycle accident with marked dorsal hand deformity and swelling. Radiographs confirmed dorsal dislocation of the second to fifth CMC joints. The injury pattern reflected disruption of the stabilizing ligamentous structures analogous to those involved in Lisfranc injuries, resulting in a similarly unstable configuration.

Closed reduction was attempted but failed due to persistent joint instability. Open reduction was therefore performed, and stabilization achieved using two Kirschner wires: one spanning the first metacarpal and hamate to reinforce radial column integrity, and a second between the fourth metacarpal and capitate to stabilize the central column. Immobilization was maintained for six weeks, after which the wires were removed and a structured physiotherapy program initiated.

Results: At two months postoperatively, the patient demonstrated good functional recovery as assessed by the Michigan Hand Outcomes Questionnaire, with restoration of mobility, grip strength, and daily function. No residual instability was observed.

Conclusions: This case underscores the exceptional rarity of multi-CMC dislocations and reinforces their anatomical and pathological similarity to Lisfranc injuries of the foot. Both involve disruption of a complex joint network designed for

stability, and both can be initially subtle yet highly unstable. Early identification and rigid stabilization are crucial to prevent chronic dysfunction. Surgical fixation, when closed reduction proves inadequate, offers reliable restoration of joint alignment, while timely rehabilitation supports the return of hand function.

A-0836 ULTRASOUND-GUIDED TRIGGER THUMB RELEASE: RESULTS FROM A PROSPECTIVE COHORT STUDY

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Introduction: Trigger thumb is the second most frequently affected digit, and open A1 pulley release remains the standard surgical treatment. Concerns regarding incomplete release and the risk of tendon or neurovascular injury have limited the use of percutaneous techniques, particularly in the thumb. Ultrasound guidance offers the potential to increase accuracy and safety while maintaining the advantages of a minimally invasive procedure.

Aim: To evaluate the effectiveness and safety of ultrasound-guided percutaneous A1 pulley release in patients with trigger thumb.

Material & Methods: A single-centre prospective cohort study was conducted including consecutive patients with idiopathic trigger thumb treated between October 2023 and June 2024. Inclusion criteria were Quinell grade 2 or higher and symptoms for at least four months. Exclusion criteria were concomitant flexor tenosynovitis, thumb carpometacarpal osteoarthritis, or carpal tunnel syndrome. All procedures were performed under WALANT in an office setting using a standardized retrograde ultrasound-guided technique with a Kemis scalpel. Clinical and patient-reported outcomes were collected at baseline and at 1 and 3 months. The primary outcome was Quinell grade. Secondary outcomes included the visual analogue scale (VAS) for pain, QuickDASH, and EuroQol-5D. A successful outcome was defined as Quinell grade 0 or I at one month, and recurrence as Quinell grade 2 or higher after initial improvement. Numerical data are presented as median and range, and categorical data as percentages.

Results: Thirty-four thumbs in 27 patients were included. Median age was 66.9 years (range 45 to 79). Baseline Quinell grade distribution was: grade 2 in 20 thumbs (59 %), grade 3 in 7 thumbs (21 %), and grade 4 in 7 thumbs (21 %). A successful outcome was observed in all cases at one month, with 34 thumbs (100 %) achieving Quinell grade 0. At three months or later, 33 thumbs (97 %) maintained Quinell grade 0, and one thumb (3 %) showed Quinell grade 1 without functional limitation. No recurrences were identified.

At baseline, median VAS was 6.5 (range 0 to 9.8), QuickDASH 34.1 (range 6.8 to 65.9), and EuroQol-5D 0.87 (range -0.10 to 1.00). Median intraoperative VAS was 0.0 (range 0 to 2.0). Median postoperative first-week VAS was 0.53 (range 0 to 7.2). At one month, VAS was 0.0 (range 0 to 1.21), QuickDASH improved to 5.7 (range 0 to 22.7), and EuroQol-5D increased to 1.0 (range 0.47 to 1.00). At three months or later, VAS remained 0.0 (range 0 to 1.37), QuickDASH improved to 2.3 (range 0 to 22.7), and EuroQol-5D remained 1.0 (range 0.57 to 1.00). All improvements were statistically and clinically significant ($P < 0.01$).

No complications were recorded. There were no nerve injuries, tendon injuries, infections, wound complications, or reoperations.

Conclusions: Ultrasound-guided percutaneous A1 pulley release for trigger thumb proved to be a safe and highly effective procedure in this prospective cohort with a minimum follow-up of three months, supporting its use as a minimally invasive alternative to open surgery.

A-0837 HAND SURGERY IN CEREBRAL PALSY IN SWEDEN

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Introduction: Cerebral palsy (CP) affects approximately 2 in 1000 children and often results in lifelong motor and cognitive impairments. Children with spasticity in the upper extremity frequently exhibit muscular imbalance that disrupts precise hand positioning and coordinated movements. Hand surgery can be used to rebalance muscular forces and correct contractures through various surgical procedures. Evidence regarding the optimal treatment approaches and timing is limited.

Aim: This study aims to provide a comprehensive national overview of hand surgery among children with CP in Sweden.

Material & Methods: We analyzed upper extremity surgeries registered in children with CP up to 18 years, using two Swedish national registers, CPUP and HAKIR, covering 2013 to 2023. Registered procedures, age, sex, diagnosis and functional classification including House (hand function), MACS (Manual Ability Classification System) and GMFCS (Gross Motor Function Classification System) were retrieved.

Results: We identified a total of 367 children who underwent 433 hand surgical sessions between 2010 and 2023. The most common procedure was release at the forearm level, with 247 procedures performed; among these, 109 could be identified as pronator releases and 91 as wrist releases. Additionally, there were 89 thumb releases at the hand level. We identified 167 multilevel procedures. The majority of the operated children were boys. We analyzed the age at surgery, diagnosis, and functional level associated with the various procedures, including the timing of tendon transfers (121 procedures).

Conclusions: This study delivers a nationwide perspective on hand surgery in children with CP in Sweden and underscores the need for further research to optimize surgical strategies aimed at rebalancing the spastic hand. Key obstacles to evidence generation include systemic limitations in the classification of surgical procedures system and the complex, unique anatomy of the upper extremity, which limit the usefulness of registry data.

A-0838 MANAGEMENT AND OUTCOMES OF HIGH-PRESSURE INJECTION HAND INJURIES: EXPERIENCE FROM A SINGLE TRAUMA CENTER

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Introduction: High-pressure injection injuries of the hand are rare but potentially devastating emergencies, associated with high morbidity and amputation rates reported to reach 48 percent. The extent of tissue destruction is often underestimated at the time of presentation, while the injected substance, the volume, and the delay to surgical debridement critically influence outcomes. Due to their infrequency, published clinical series remain limited, and optimal management continues to be defined primarily through accumulated experience. This study presents the clinical characteristics, treatment strategy, and functional outcomes of patients with high-pressure injection hand injuries managed in our department.

Aim: The aim of this study was to review all cases of high-pressure injection hand injuries treated between 2021 and 2024 and to evaluate surgical outcomes, complication rates, and functional recovery.

Material & Methods: Fourteen male manual laborers, with a mean age of 43 years (range: 25–66), underwent operative treatment for high-pressure injection injuries of the hand between 2021 and 2024. The non-dominant hand was affected in 77 percent of cases. Injury sites included the palm in five patients, the index finger in eight, and the ring finger in one. Paint was the most commonly injected substance (11 patients). The mean time from injury to initial surgical debridement was 15 hours (range: 4–96). Management consisted of extensive debridement with opening of adjacent compartments, copious irrigation, partial wound closure, and broad-spectrum intravenous antibiotics. One patient presented with additional injuries, including laceration of the median nerve and the flexor carpi radialis tendon.

Results: The mean follow-up period was 11 months (range: 7–20). Patients required an average of 1.7 surgical procedures (range: 1–4). Digital amputation was performed in two patients (14 percent). Seven patients achieved full or functionally satisfactory range of motion, while grip and lateral pinch strength was reduced by 17% and 30% respectively compared to the non injured hand. Sensitivity was affected in 5 cases at the 2-point discrimination test. The mean QuickDASH score was 13,8.

Conclusions: Despite the traditionally high amputation rates described in the literature, our series demonstrated encouraging functional outcomes, even in cases with delayed initial debridement. Given the rarity of these injuries and the small number of cases both in our study and internationally, further clinical data are needed to refine management protocols and improve prognostic assessment.

A-0839 CHOOSING APPROPRIATE ANTISEPTICS FOR WOUND CARE IN HAND THERAPY

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Introduction: Hand therapists regularly manage a wide variety of wounds. Determining whether a wound requires simple cleansing or full antisepsis, and selecting the most appropriate antiseptic, is an essential component of clinical reasoning in this sensitive and functionally important area. This decision plays a key role in preventing complications and supporting optimal healing.

Aim: This presentation aims to provide an overview of cleansing solutions and antiseptics available on the European market, and to offer practical recommendations for their use in hand therapy. The goal is to highlight the range of options and support evidence-based decision-making to ensure high-quality care for patients presenting with wounds during hand therapy.

Material & Methods: Recommendations were derived from an in-depth analysis of the 2018 consensus on wound antisepsis by Kramer et al. as well as the 2023 international consensus published by Wounds International. These sources were reviewed and adapted to reflect the specific context and clinical needs encountered in hand therapy. The analysis focused on identifying commonly used cleansing agents and antiseptic families, as well as their indications within therapeutic practice.

Results: In outpatient clinics and hospital settings, hand therapists typically rely on saline solutions, with or without low concentrations of antiseptics, as well as more concentrated antiseptic products. Six major antiseptic families were identified as most relevant in practice: chlorhexidine digluconate, povidone-iodine, octenidine dihydrochloride, polyhexanide, hypochlorites, and silver ions. This presentation provides a practical guide to selecting targeted and effective approaches based on wound characteristics and etiology. A better understanding of the properties of each agent supports more accurate clinical decisions, reduces infection risk, and promotes faster wound healing for patients undergoing hand therapy.

Conclusions: Selecting the appropriate antiseptic for each wound is crucial in hand therapy. This approach improves clinical safety, supports infection prevention, and enhances healing outcomes.

A-0840 PRINCIPLES OF RECONSTRUCTIVE INTERVENTIONS IN MINE BLAST INJURY

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Introduction: A mine blast injury is a tragedy for the individual, a tragedy for society, and a challenge for the surgeon. We need to treat this injury using all of our reconstructive microsurgical expertise.

Aim: To identify the most significant factors affecting the success of mine blast injury treatment

Material & Methods: From 2022 to 2025, 7 patients with combined mine-blast injuries underwent surgery. The main problem in selecting a treatment method for these patients was the significant limitation in choosing a donor site due to multiple injuries to the limbs and body. The maximum and careful use of each donor site, staged treatment planning, and combating the infectious process became the main features of treating these patients.

The following items were included in the treatment planning:

Detailed diagnosis

Perfect knowledge of the anatomy

An understanding of the function of each damaged structure

Possible options for repairing each of them

Priority of repair

Possibility and necessity of one-stage repair

Knowledge of donor sites and how to maximize their use at each stage

The number and stages of reconstruction and what will be included in each stage

Duration and intensity of rehabilitation

Periods for evaluation of treatment results and transition to the next stage

Results: There is a major obstacle in treating the infection.

We have come across a variety of microorganisms that are not commonly linked to the management of common trauma injuries. One major contributing factor to this phenomenon is the growing resistance of microorganisms to the currently used antibiotic. The ability of microorganisms to create a barrier at the infection site and stop antibiotics from influencing their growth is a secondary factor.

Microsurgical or reconstructive procedures are not always contraindicated by infectious processes involving bones and joints as long as the structures receive enough blood flow. It has been determined that if the bone or soft tissue defect is closed with vascularized flaps, the prognosis will be improved and antibiotic therapy will be facilitated

Conclusions: The presence of micro surgically restored structures in the wound bed does not constitute a contraindication to the utilization of negative pressure dressings (i.e., vacuum therapy) in cases involving transplanted flaps. The aforementioned treatment is applicable in two distinct contexts. First, it is used during the tissue preparation phase for reconstructive surgical procedures. Second, it is used as a therapeutic modality following the completion of surgical interventions in cases where indications of infection are observed

The management of mine blast injuries demands a synthesis of the extant knowledge concerning the treatment of upper limb tissue defects

The optimal combination and staged application of these elements enables the realization of optimal patient outcomes

A-0841 TREATMENT AND OUTCOMES OF RADIAL HEAD AND NECK FRACTURES WITH THE “TRIPOD TECHNIQUE”: A CASE SERIES

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Aim: Fractures of the radial head and neck are the most common elbow fractures, which can cause elbow dysfunction and reduced quality of life. The “Tripod Technique” is a new, less invasive method for fixing these fractures. The objective of this study was to assess the functional outcomes of Tripod Technique for treatment of radial head and neck fractures. **Methods:** This case series was performed on eight patients with radial head and neck fractures who were admitted to our teaching hospital in Tehran between 2021–2023 and treated with the Tripod Technique by a single surgeon. Patients were evaluated for demographic factors, type of trauma, fracture type, functional outcomes (DASH score and Broberg & Morrey score), and surgical complications. Any para clinical medication has been managed.

Results: Eight patients with median age of 40 (range, 27–57 years), were evaluated radiographically and clinically 12 months post-surgery. All fractures had healed without problems. The median DASH score was 11 (range, 11–13), and the Broberg & Morrey score was 99 (range, 90–100). The median of supination was 89° (range, 75–90°), pronation was 89° (range, 30–90°), extension lag was -4° (range, -35–0°), and flexion was 139° (range, 130–142°). Only one case of ulnar hypoesthesia was reported. No reoperations were performed.

Conclusion: In this limited case series, the Tripod Technique demonstrated promising functional and radiological outcomes with minimal complications as a minimally invasive approach for radial head and neck fractures; however, studies with larger patient cohorts are needed to confirm its safety and efficacy.

A-0842 RADIOGRAPHIC PREOPERATIVE PLANNING IN MAIA™ TRAPEZIOMETACARPAL JOINT REPLACEMENT: FINDINGS FROM A RETROSPECTIVE COHORT OF 100 PATIENTS

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Introduction: Thumb carpometacarpal (CMCJ) osteoarthritis is a highly prevalent degenerative condition that significantly affects hand function and quality of life. Total joint arthroplasty with the MAIA™ prosthesis has become an effective treatment option, but optimal implant selection and positioning remain essential to long-term success. While radiographic planning is well established in major joint arthroplasty, standardized models for CMCJ replacement are lacking. Identifying radiographic predictors of implant size may improve surgical accuracy and reduce complications. This study presents the results of Phase 1—a retrospective evaluation of 100 patients—to assess correlations between preoperative radiographic measurements and definitive MAIA™ implant sizes.

Aim: To determine whether specific preoperative radiographic parameters correlate with the final implant sizes used in MAIA™ trapeziometacarpal joint arthroplasty.

Materials & Methods: A retrospective cohort of 100 patients who underwent MAIA™ CMCJ arthroplasty for primary trapeziometacarpal osteoarthritis (Eaton–Littler stage II–III) was analyzed. Standardized radiographs (Kapandji frontal/lateral views and hyperpronation view) were reviewed.

Collected variables included: demographic data; trapezial height and width; trapezial center of rotation; endomedullary canal width of the first metacarpal in anteroposterior and lateral views; and M1–M2 ratios. Implant sizes for the cup, stem, and neck were extracted from operative records. Correlations between radiographic parameters and implant sizes

were assessed. Postoperative complications such as dislocation, stiffness, aseptic loosening, and tendinitis were recorded. Results: Several radiographic measurements demonstrated moderate to strong correlation with the definitive implant sizes: Trapezial width showed a strong correlation with cup size. Endomedullary canal width correlated with stem size (both in AP and lateral view). The M1–M2 ratio showed a moderate association with neck size. Complications were infrequent: 3 cases of postoperative stiffness and 2 cases of tendinitis. No aseptic loosening was observed during the available follow-up (median 14 months). No radiographic variable demonstrated a significant association with early complications. Conclusions: This retrospective analysis supports the potential for developing a standardized radiographic planning model for MAIA™ CMCJ arthroplasty. Key radiographic parameters—particularly trapezial width and first metacarpal canal width—correlate reliably with implant sizing and may form the basis of a preoperative planning algorithm. The low complication rate further supports the safety of the procedure. These findings provide the foundation for the prospective Phase 2 study, aimed at validating the predictive value of radiographic planning and assessing its clinical impact.

A-0843 PREVALENCE AND PREVENTION OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG OCCUPATIONAL THERAPISTS AND PHYSIOTHERAPISTS IN AUSTRIA

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Austria

Work-related musculoskeletal disorders are the most common health issue in the European health sector. Physical impairment and chronic pain not only minimize the quality of life of healthcare professionals but also increase costs and reduce productivity in institutions and the health system. Occupational therapists and physiotherapists are often affected despite their essential role in treatment and prevention. To date, no studies have investigated the situation in Austria. Therefore, the aim of this master thesis was to investigate the current prevalence of work-related musculoskeletal disorders among occupational therapists and physiotherapists in Austria. Furthermore, the objective was to identify risk factors as well as prevention and health promotion strategies that have already been applied or can be implemented in the future. A quantitative online survey based on standardized assessment instruments was conducted among occupational therapists and physiotherapists across Austria between March and May 2025. The survey was shared via professional associations and social media platforms. Statistical analysis was undertaken using SPSS.

Among 206 respondents, 87% reported work-related musculoskeletal disorders during their careers. The most affected regions were the upper extremities and along the spine.

More than half of the complaints were moderate to very severe and began gradually. Women were slightly more affected than men and complaints increased significantly with age, years of professional experience and the number of patients treated per day. Hand therapists showed one of the highest prevalences in all professional fields, with 98% reporting symptoms. Due to the complaints, nearly 70% of the respondents changed treatment approaches (e.g. reduced manual techniques or changed treatment due to pain) and 29% had considered changing their profession. This can have a big impact on the availability and quality of treatment and rehabilitation in the future.

The causes of the complaints were diverse and multi-dimensional, but complaints were frequently reported while performing manual therapy techniques, working in awkward or static positions, treating a high number of similar cases or patients per day. Preventive strategies who are already used, such as changing working positions, adapting the work environment, using assistive devices or improving physical fitness, take a focus on finding balance in the therapist's

musculoskeletal system. But balance not only focuses on the individual professional health but also on factors like the organization of work, work tasks and the work environment. In the future, there remains a need for more holistic and systemic approaches and awareness of the underlying causes of work-related musculoskeletal disorders.

A-0844 OUR INDICATIONS FOR THE SPANNING PLATE

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Introduction: In recent years, the Spanning Plate technique has established itself as a valuable option in the treatment of complex hand and wrist injuries. The method is mainly used for complex distal radius fractures, intra-articular fractures, and severe soft tissue injuries with high instability.

Aim: Special indications arise in cases of polytrauma, open fractures, or extensive soft tissue complications where stable fixation is essential. In addition, the Spanning Plate offers advantages in the treatment of injuries that require delayed mobilization of wrist function to prevent secondary osteoarthritis, malalignment, or instability. Recent studies have confirmed that the Spanning Plate not only provides effective stability during the healing phase, but also supports anatomical reconstruction of the wrist axis and promotes functional outcomes

Material & Methods: We analyzed the indication and outcome of 17 patients with distal radius fracture operated with a spanning plate

Results: After plate removal all patients showed limited wrist motion compared to the uninjured contralateral side. No further complications were detected.

Conclusions: The spanning plate is particularly suitable for patients with complex fractures and accompanying soft tissue injuries, where stability is prioritized over function. Our experience shows that precise indication is essential to achieve optimal results. Future research should focus on long-term results and further improvement of stabilization materials.

A-0845 NON-REPAIRABLE SCAPHOID PROXIMAL POLE NONUNION RECONSTRUCTION BY HAMATE ARTHROPLASTY: A CASE SERIES STUDY

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Objectives Non-repairable scaphoid proximal pole nonunion remains a major challenge. Various reconstructive surgical approaches have been introduced, but each one has some limitations, including microvascular anastomosis, donor site morbidities, and the risk of compromising the scapholunate ligament.

Method This prospective interventional case series was performed on five patients. The patients underwent reconstructive surgery using proximal hamate arthroplasty by a single surgeon and were followed up for at least 12 months.

Results All patients were male and the median age was 28, and the median follow-up time was 24 months. The median Mayo score was 70, and the DASH score was 0 (no disability) in 3 patients and 15 in two patients. The median of postoperative grip strength in the operated hands was 37.3 kg (Range 36.1–39) and in the opposite hands was 42.5 kg (Range 40–45.9). However, there were significant differences between grip strength between operated and opposite hands (P value = 0.008). A reduction of 11.1% and 15% was shown in postoperative flexion and extension compared with

preoperative flexion and extension (P value = 0.194, P value = 0.102).

Conclusion Hamate arthroplasty for nonunion of the scaphoid proximal pole appears to be a viable surgical option with favorable outcomes in terms of union rates, functional recovery, and patient satisfaction.

A-0846 SHOULD A GRADE 3 SL LIGAMENT INJURY ACCORDING TO THE GEISSLER CLASSIFICATION IN ACUTE DISTAL RADIUS FRACTURES BE TREATED SURGICALLY? RESULTS OF RE-ARTHROSCOPY AT THE TIME OF IMPLANT REMOVAL

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Introduction: Scapholunate (SL) ligament injuries in acute distal radius fractures (DRFs) are rare. While partial ruptures are classified as grade 1 and 2 according to Geissler and are not treated surgically, and complete ruptures are classified as grade 4 and are treated surgically, there is no consensus on whether grade 3 injuries should be treated surgically at the time of fracture fixation. We report on the natural course of untreated grade 3 SL ligament ruptures associated with acute DRFs. **Patients and methods:** Nineteen patients (14 male and 5 female) with an average age of 57 years with acute DRF (all AO type C3) were treated in 12 cases with palmar plate fixation and in 7 cases with dorsal plate fixation. All patients were diagnosed with acute grade 3 SL ligament injury by arthroscopy. All patients were treated postoperatively for 2 weeks with a palmar splint as part of radius fracture care. In addition, further treatment of the SL ligament injury was performed. At the time of implant removal, re-arthroscopy was performed to reevaluate the stage of SL ligament instability. During the final follow-up examination, native radiological and clinical results were collected and compared with the uninjured side. **Results:** The average follow-up period was 4.2 years. Wrist extension was 63°, flexion 55°, pronation 69°, and supination 62°. The mean grip strength was 86% of the uninjured contralateral side. The mean DASH score and PRWE score were 12 and 18 points, respectively.

The mean pain measured using the visual analog scale was 2. The immediate postoperative SL distance on the posteroanterior (PA) X-rays with the wrist in ulnar deviation was 1.2 mm on average and 1.4 mm at the last follow-up examination.

Six patients showed grade 2 radiocarpal arthritis according to Knirk and Jupiter. Implant removal and rearthroscopy were performed after an average of 2.6 years. During rearthroscopy, no progression of SL instability from grade 3 to grade 4 was observed.

Conclusion: Grade 3 SL ligament injuries according to Geissler in connection with acute DRFs, without surgical treatment, showed no progression to grade 4 at the time of rearthroscopy during implant removal.

A-0847 SCAPHOID STRESS FRACTURES: A CASE SERIES OF A VERY UNFREQUENT PATTERN

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Introduction: Scaphoid stress injuries are rare, often radiographically occult at onset, and may progress from stress reaction to nonunion or refracture in high-demand athletes. Evidence is limited to isolated case reports, and no scaphoid-specific staging system, treatment algorithm, or operational definition of refracture has been established.

Aim: To describe a consecutive case series of scaphoid stress injuries in Jai Alai athletes, propose a stage-based classification with stage-matched treatment recommendations, and define practical criteria for true refracture.

Material & Methods: A single-centre retrospective case series was conducted including consecutive Jai Alai players presenting between 2021 and 2024 with radial-sided wrist pain and imaging findings consistent with scaphoid stress injury. Inclusion criteria were active participation in Jai Alai, clinical suspicion of scaphoid involvement, and MRI and/or CT/CBCT evidence of stress reaction or stress fracture. Exclusion criteria were acute high-energy trauma, prior scaphoid surgery, metabolic bone disease, or incomplete follow-up. Imaging work-up included radiographs, MRI for marrow stress reaction, and CT/CBCT for cortical integrity, chronicity, and union. Management was tailored to stage and sport demands, ranging from load restriction and orthosis to percutaneous screw fixation or bone grafting with internal fixation. Outcomes included union or stable healing, refracture, complications, and time to return to sport.

Results: Five male athletes (age range 12–18 years) were included. At presentation, one had a stress reaction (Stage I), one a chronic incomplete fracture (Stage IIa), two complete nondisplaced fractures (Stage III), and one a fibrous nonunion (Stage IVa). Stages I and IIa were successfully managed conservatively. One Stage III fracture healed after screw fixation; the other initially healed with conservative treatment but progressed to nonunion requiring two bone grafting procedures. The Stage IVa nonunion healed after arthroscopic cancellous grafting and screw fixation. Two athletes (both Stage III) met criteria for true refracture after confirmed union. All athletes returned to sport between 6 and 12 months, achieving final union or stable, pain-free wrists. Based on clinical and imaging evolution, a five-stage classification (I–V), a stage-matched treatment algorithm, and operational refracture criteria were developed.

Conclusions: Scaphoid stress injuries in high-demand athletes represent a very uncommon but clinically significant pattern. A structured, stage-based approach combining MRI and CT/CBCT may improve diagnostic accuracy and guide individualized treatment. The proposed classification and refracture criteria can standardise reporting and support clinical decision-making. Long-term follow-up and cautious return-to-sport planning are essential to reduce the risk of recurrence.

A-0848 ULTRASOUND-TO-RADIOGRAPH IMAGE TRANSLATION OF THE DISTAL RADIUS USING CYCLEGAN: PRELIMINARY FEASIBILITY STUDY

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Introduction: Ultrasound is widely used in orthopedic practice for the assessment of soft tissues and as a valuable complement to clinical examination and traditional imaging modalities such as radiography and computed tomography (CT). Although several studies have suggested that ultrasound can detect certain cortical irregularities or fractures, its application for detailed bone evaluation remains limited due to inherent resolution constraints. Recent advances in artificial intelligence—particularly machine learning and generative models—have opened new possibilities in medical imaging. Generative Adversarial Networks (GANs), and specifically CycleGAN architectures, have demonstrated strong performance in translating images between different modalities without requiring paired datasets. Based on this potential, we explored whether distal radius ultrasound images could be converted into synthetic radiographs. This study presents our preliminary findings.

Aim: To evaluate the feasibility of generating synthetic radiographs of the distal radius from ultrasound images using a CycleGAN-based model.

Materials & Methods: Between November 2024 and April 2025, we developed a custom software system based on the CycleGAN architecture to perform ultrasound-to-radiograph image translation. The training dataset consisted of 100

ultrasound images and 100 radiographs of the distal radius in anteroposterior projection. Training was performed using an unpaired image-to-image translation approach. Model performance was assessed qualitatively by evaluating the anatomical plausibility and the radiographic-like appearance of the generated synthetic images.

Results: The CycleGAN model successfully produced synthetic radiographic images with acceptable visual quality, demonstrating recognizable cortical profiles and overall radiographic structure. Although fine osseous details and subtle cortical transitions were not consistently reproduced, the system showed encouraging potential for translating ultrasound information into a radiograph-like domain. Preliminary feedback from two independent orthopedic evaluators indicated that over 90% of generated images were considered “clinically interpretable” at least for gross bone contour assessment.

Conclusions: This preliminary study demonstrates the feasibility of converting distal radius ultrasound images into synthetic radiographs using an unpaired CycleGAN approach. Expanding the dataset to at least 5,000 images is expected to substantially improve accuracy, detail resolution, and model generalizability. Future developments will include extending the method to additional projections (e.g., lateral view), implementing real-time inference for point-of-care applications, and conducting quantitative validation against expert radiologic assessment.

A-0849 EVALUATING HETEROGENEOUS TREATMENT EFFECT AND PREDICTORS OF TREATMENT SUCCESS IN DUPUYTREN'S CONTRACTURE: A SECONDARY ANALYSIS OF DUPUYTREN TREATMENT EFFECTIVENESS TRIAL (DETECT) Janne Soikkeli¹, Venla-Linnea Karjalainen², Mikko Räisänen³, Olli Leppänen⁴, Teemu Karjalainen⁴, Aleksi Reito⁵

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Introduction: We shewed in Dupuytren treatment effectiveness trial (DETECT) that treatment's success at two years follow up was best in limited fasciotomy (LF) group compared to percutaneous needle fasciotomy (PNF) and collagenase histiolyticum (CCH) groups. In DETECT, we estimated the average treatment effect of a selected patient cohort at a group level. This means that our trial results describe the group-level effectiveness when all patients in the group are treated the same way. However, this does not account for individual variations, known as heterogeneous treatment effects (HTE). Addressing HTE, responder analysis identifies patients benefiting from treatment, and subgroup analysis examines treatment effectiveness across patient subgroups defined by specific covariates, enhancing personalized medicine approaches.

Aim: The aim of this secondary analysis study was to investigate 1) which patient specific and treatment specific factors predict success and average total passive extension deficit (TPED) at 3 months and 2-year follow-up and 2) if there is evidence for HTE favoring the idea of patient selection for different treatment modalities

Material & Methods: We included all 302 randomized patients from DETECT. For the first study aim, we used ordinary least squares regression to estimate success and average TPED at 3 months and 2-year follow-up. All collected baseline variables were inputted as predictors in a single global model. R2 was used to assess the overall model fit. Variable importance was assessed using the Wald Chi-squared test minus degrees of freedom. QQ-plots were used to assess assumptions of error term normality. We used the methodology described in the PATH statement for the second study aim. First, a multivariable model similar to the above was built, except that treatment was not included as a predictor. Fitted values from this model were calculated for each patient. These values provided a predicted baseline outcome when treatment was not considered, given all other baseline variables. In the second phase, a regression model was built, including the interaction between the fitted outcome and treatment allocations. This model offered the possibility

to assess if treatment effects varied across different outcome estimates based on the baseline covariates. All analyses were done with RStudio in rms package.

Results: LF treatment group was the most important predictor of the treatment success at 2-years follow up. For TPED, the most important predictor was TPED at the baseline. We found no evidence of heterogenous treatment effect in different treatment groups.

Conclusions: Our results show that patient selection for specific treatment, based on patient specific factors available to us, does not seem to be viable option in Dupuytren's contracture.

A-0850 OUR EXPERIENCE WITH ENDOPROSTHETIC TREATMENT OF TRAPEZIOMETACARPAL JOINT OSTEOARTHRITIS AT THE GENERAL HOSPITAL PTUJ, SLOVENIA

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Introduction: Trapeziometacarpal (TMC) joint osteoarthritis is a prevalent degenerative hand condition that significantly impairs daily hand function. While trapeziectomy with ligament reconstruction and tendon interposition (LRTI) remains the standard surgical option, recent developments in total arthroplasty offer potential benefits, especially in younger, active patients. We introduced cementless "ball-and-socket" TMC joint endoprostheses with hydroxyapatite coating to our department in 2024. In Slovenia, this procedure is still performed seldomly.

Aims: The primary aim of this study was to evaluate early clinical outcomes and complication rates of TMC joint endoprosthetic treatment at our institution.

Materials & Methods: Between October 2024 and November 2025, ten consecutive patients (six females, four males; mean age, 56.4 years; range, 44 – 64) underwent a cementless "ball-and-socket" total TMC joint arthroplasty with a hydroxyapatite-coated implant at the Department of Surgery, General Hospital dr. Jožeta Potrča Ptuj. Indications included symptomatic stage ≥ 2 radiographic TMC osteoarthritis, a minimum of six months of failed conservative management, and a younger active lifestyle. Postoperative protocol included two-week immobilisation, followed by progressive motion exercises, restriction of heavy activities for 4–6 weeks, and standard outpatient follow-ups at 2 and 8 weeks. The data collected comprised pain scores, pinch strength, range of motion, sensory disturbances (specifically, the radial nerve superficial branch), and patient satisfaction. The follow-up duration ranged from 1 to 13 months at the time of reporting.

Results: Nine of ten patients reported significant pain reduction and satisfaction with the surgical outcome. One patient developed a complex regional pain syndrome (CRPS) with ongoing wrist/finger pain, swelling, and reduced muscle strength; this case is under continuing review. Five patients (50%) experienced postoperative paresthesia in the distribution of the superficial branch of the radial nerve. No instances of dislocation, implant loosening, or early catastrophic failure have been noted to date. One patient resumed hand-craft leisure activity at 12 months.

Conclusion: Based on preliminary experience, particular attention will be directed towards protecting the superficial branch of the radial nerve during future procedures. Although the initial results are promising, long-term follow-up is required to fully evaluate the effectiveness and durability of this method.

A-0851 SUBCHONDRAL BONE MINERAL DENSITY DISTRIBUTION AND AGE-RELATED CHANGES IN HEALTHY THUMB CARPOMETACARPAL JOINTS

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Introduction: The subchondral bone mineral density (BMD) distribution reflects the joint surface stress. Understanding the normal BMD distribution of the thumb carpometacarpal (CM) joint is useful for predicting joint-loading patterns during functional activities. Furthermore, identifying age-related variations in otherwise normal joints is essential for understanding physiological adaptation and early degenerative processes. This study aimed to characterize the normal subchondral BMD distribution of the CM joint and to evaluate age-related changes.

Methods: Among patients with upper limb disorders who underwent bilateral upper extremity CT scans including the thumb CM joints with a bone mineral calibration phantom, we selected 30 subjects (60 hands) without radiographic signs of thumb CM osteoarthritis. Patients were divided into a younger group (14 subjects, 28 hands; aged ≤ 49 years; 9 males and 5 females) and an older group (16 subjects, 32 hands; aged ≥ 50 years; 5 males and 11 females). Three-dimensional bone models of the first metacarpal and trapezium were reconstructed, and the subchondral regions of the thumb CM joint were defined as the regions of interest. On each bone, an equally spaced grid of points of interest (POIs) was placed (110 POIs on the first metacarpal and 98 on the trapezium), and the CT values within each POI were converted to volumetric BMD (mg/cm^3) using the calibration phantom. Cluster analysis of the BMD data was performed to segment each articular surface into distinct regions. For each bone, BMD was compared among the regions to identify high-BMD regions, and regional BMD was compared between age groups.

Results: Cluster analysis segmented the first metacarpal into four regions and the trapezium into two regions. BMD was significantly higher in the radial and volar-ulnar regions of the first metacarpal ($p < 0.05$) and in the dorsal-ulnar region of the trapezium ($p < 0.01$).

In all regions, BMD was lower in the older group than in the younger group ($p < 0.05$), and the reduction was greater in the high-BMD regions, indicating a tendency toward a more homogeneous BMD distribution.

Discussion: The high-BMD regions on the radial and volar-ulnar metacarpal correspond to the regions that contact the trapezium under peak grasp and pinch loading, likely reflecting physiological loading patterns. The dorsal trapezium high-density regions correspond to the regions in sustained contact during the natural resting position, suggesting bone remodeling from chronic mechanical stress. The shift toward a more homogeneous BMD distribution in the older group appears to reflect age-related changes in the mechanical environment of the thumb CM joint and may represent an early stage in the pathogenesis of osteoarthritis.

A-0853 PATTERNS OF STRUCTURAL INJURY AND THEIR IMPACT ON OPERATIVE TIME IN GLASS-RELATED HAND LACERATION: A RETROSPECTIVE STUDY

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Introduction: Glass-related hand injuries are common in emergency departments and frequently involve tendons, nerves, and arteries, either in isolation or in combination. Despite their high prevalence, glass-cut injuries have received remarkably little focused attention in the literature. There remains a significant and clinically relevant knowledge gap regarding which structures are most commonly damaged in glass-related trauma and how the complexity of these injuries influences operative time. Understanding patterns and surgical times is essential for effective operative planning, resource allocation, and patient counseling.

Aim: The aim of this study was to characterize injury patterns in hand lacerations caused by glass and to evaluate how the involvement of different anatomical structures—tendons, nerves, and arteries—affects operative time. By identifying the most frequently injured structures and quantifying the impact of injury complexity on surgical duration, we aimed to address the existing gap in the literature and provide practical data to support preoperative planning and operative scheduling in glass-related hand trauma.

Material & Methods: We retrospectively reviewed all patients undergoing surgery for glass-related upper extremity injuries between January 2017 and December 2021 at a single tertiary center. Demographic information, injured anatomical structures (tendons, nerves, and arteries), and operative details were collected from medical records. Injuries were categorized into predefined groups based on involved structures: single-tendon, multiple-tendon, tendon+nerve, tendon+artery, tendon+nerve+artery injuries. Operative time (minutes) for each case was recorded, and injury patterns were documented to describe the distribution and complexity of glass-related hand trauma. All statistical analyses were performed to evaluate differences in operative times across injury subgroups.

Results: Seventy-eight patients were included. Tendon injuries were most common, especially in flexor tendons ($n=93$, 46%). Nerve injuries occurred mainly with tendon injuries, mostly affecting digital nerves ($n=25$). Arterial injuries were rare. The most frequent combination was tendon + nerve injuries ($n=35$). Operative time varied by injury type and complexity ($p < 0.001$). Median time was shortest for single-tendon repairs (65 min, range 25–115) and longest for procedures involving tendon, nerve, and artery (180 min, range 13–440). Mann–Whitney U tests and Holm’s correction showed that single-tendon, multiple-tendon, and tendon + nerve repairs had shorter operative times compared to tendon + nerve + artery ($p = 0.0032$, $p = 0.0173$, $p = 0.0171$). Surgeries involving tendon + artery injuries (median 110.5 min, range 3–240) did not differ significantly from other groups.

Conclusions: Glass-related hand injuries most commonly involve tendons, especially flexor tendons, often combined with nerve injuries. Combined injuries, involving nerves and arteries are associated with substantially longer operative times. These findings provide valuable guidance for surgeons highlighting the importance of preoperative assessment for estimating operative time, planning surgery, and allocating resources.

Keywords: Glass-related hand injury, hand laceration, neurotendinous injury, hand trauma

A-0854 ARTHROSCOPIC EVALUATION OF KIENBÖCK'S DISEASE; A PROSPECTIVE STUDY ON 28 PATIENTS IN A REFERRAL CENTER IN IRAN

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Background and Aim: Kienböck disease, a form of avascular necrosis affecting the lunate bone, leads to wrist pain and limited extension. Traditional classifications, such as Lichtman, are limited in providing detailed joint assessments. This study aims to evaluate Kienböck disease using arthroscopy to identify an optimal classification method.

Materials and Methods: This prospective study included 28 Kienböck patients at Taleghani Hospital from 2018 to 2020. Arthroscopic evaluations utilized standard techniques, with Modified Outerbridge classification for cartilage damage and Lichtman classification for radiological assessment. Data were analyzed using SPSS software.

Results: The sample had a mean age of 30.5 ± 8.57 years, with 64.3% male. Lichtman classification distributed patients across stages 1 to 4, with a significant correlation between advanced Lichtman grades and increased joint involvement.

The most frequently affected joints were the distal radius and proximal lunate (89.3%), followed by the distal lunate (75%).
Conclusion: The progression of Kienböck disease generally follows a proximal-to-distal pattern in the lunate, though vascular variations may cause isolated distal involvement. Arthroscopic assessment provides valuable insights for improving classification and treatment decisions in Kienböck patients.

A-0855 COMBINING CLASSICAL AND MODERN APPROACHES FOR DUPUYTREN'S CONTRACTURE: EARLY RESULTS OF LOCAL FAT GRAFT INJECTION AFTER OPEN FASCIECTOMY – A RETROSPECTIVE COHORT STUDY

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Aims: Open fasciectomy (AF) is the gold standard for the treatment of Dupuytren's contracture (DC), but it has a high recurrence rate. This retrospective cohort study aimed to evaluate the clinical, functional, and recurrence-preventive effects of stem cells within local fat grafts (LFG) prepared from abdominal liposuction material during the same session after AF between 2023 and 2025.

Material & Method: Twenty-three patients (28 hands) who underwent AF at a single institution and received LFG injection during the same session between January 2023 and July 2025 were retrospectively reviewed. **Inclusion:** Tubia stage II–IV, primary DC, minimum 12-month follow-up. **Exclusions:** diabetes, smoking >20 pack-years, previous treatment. 2–4 mL of lipoaspirate (prepared by centrifugation, Coleman technique) was injected into the defect area under local anesthesia after AF. **Primary outcome:** recurrence ($\geq 20^\circ$ loss) at 12 months. **Secondary outcomes:** joint angle (goniometer), QuickDASH score, patient satisfaction (VAS 0–10), complications. **Statistics:** Wilcoxon signed-rank, Kaplan-Meier.

Results: Mean age: 62 ± 8 years, 83% male. Mean pretreatment contracture was $54^\circ \pm 14^\circ$ and $8^\circ \pm 6^\circ$ on postoperative day 1. Recurrence rate at 12 months: 9% (2/23); Kaplan-Meier 1-year recurrence-free survival: 91%. The QuickDASH score decreased from 36 to 11 ($p < 0.001$). Satisfaction VAS was 8.7/10. Complications: wound healing was 4% (1/23). Mean residual contracture at 12 months was $14^\circ \pm 7^\circ$; functional success ($\leq 20^\circ$ residual) was 87%.

Conclusion: Same-session LFG injection after open fasciectomy improves functional recovery, reducing recurrence to 9% in a 2023–2025 cohort of 23 patients. This hybrid approach can be considered a promising option for the management of DC by combining conventional surgery with modern regenerative techniques.

Keywords: Dupuytren's contracture, open fasciectomy, fat grafting, liposuction, recurrence prevention, hybrid therapy

A-0856 PRESENCE OF TRANSTHYRETIN AMYLOID CARDIOMYOPATHY IN SURGICALLY TREATED CARPAL TUNNEL SYNDROME AND ULNAR NERVE ENTRAPMENT AT THE ELBOW - A RETROSPECTIVE COHORT STUDY FROM A NATIONAL REGISTER

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Introduction: Transthyretin amyloid cardiomyopathy (ATTR-CM) is rare (prevalence 5.0/100,000 inhabitants) and can be hereditary (mutation in TTR gene; variant ATTR or vATTR) or acquired (allelic constitution of TTR gene; wildtype ATTR or wtATTR). ATTR-CM is lethal if untreated (i.e., tafamidis), why early detection of the disease is crucial. Synovial or carpal ligament biopsies with staining for Congo Red is a simple method to detect amyloidosis in selected individuals that can be further investigated for ATTR-CM. Bilateral carpal tunnel syndrome (CTS) is a common extracardiac associated disorder for ATTR-CM and precedes the disease by 5-10 years. Another red flag for developing ATTR-CM is trigger finger (TF). One may hypothesize that ulnar nerve entrapment (UNE) may also act as a red flag for ATTR-CM.

Aim: To evaluate the presence of ATTR-CM among individuals surgically treated for CTS or UNE, with or without surgery for TF, or a combination of surgery for both CTS and UNE, and to analyse any factor associated with the diagnosis of ATTR-CM. **Material & Methods:** A retrospective, national register-based cohort study, with prospective inclusion of individuals, was conducted and examined the presence of ATTR-CM diagnosis in individuals ≥ 18 years treated for CTS and/or UNE, with or without TF-surgery. Data were extracted from the national quality register for hand surgery (HAKIR; hakir.se) between 2010-2021 and cross-linked with Swedish national population-based registers (i.e., the National Patient Register, the Cause of Death Register, and the Prescription Drug Register).

Results: Amongst 20,368 surgically treated individuals, 1,124 were diagnosed with heart failure (HF), 45 patients were diagnosed with amyloidosis (AM), and 112 patients were diagnosed with cardiomyopathy (CM). Among these, 33 patients had both AM diagnosis and HF or CM. After exclusions, based on diagnoses and treatments for Light Chain Amyloidosis (AL-amyloidosis) and Multiple Myeloma (n=5), 28 patients remained and were identified as likely having ATTR-CM (i.e., having the combination of diagnosis of ATTR-amyloidosis and HF/CM). Thus, ATTR-CM was present in 0.14% of surgically treated individuals. Risk markers were male sex [OR 14.28 (4.31-47.32), $p < 0.001$], surgery for bilateral CTS [OR 3.04 (1.38-6.70), $p = 0.006$], and the combination of surgery for CTS and TF [OR 3.74 (1.07-13.03), $p = 0.038$]. A higher median age at first surgical intervention for nerve entrapment disorders was observed among individuals with ATTR-CM [75 (IQR: 69-81) years] than those without ATTR-CM [55 (45-68) years]. No association between surgery for UNE and ATTR-CM was observed. **Conclusions:** Male patients, at an age around 75 years, who undergo surgery for bilateral CTS, or a combination of surgery for CTS and TF, but not for UNE, could be at risk for ATTR-CM, particularly if there is a history of heart failure. A tissue biopsy from the synovial sheath in the carpal tunnel or carpal ligament is recommended for screening.

A-0857 TARGETED DECOMPRESSION OF THE LONG THORACIC NERVE AT THE SYMPTOMATIC SEGMENT: A CASE SERIES AND OUTCOMES

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Introduction: Long thoracic nerve (LTN) palsy is traditionally associated with proximal entrapment at the scalene muscles or idiopathic neuritis, and most surgical reports describe supraclavicular decompression. However, distal hourglass

constrictions of the LTN at the mid-axillary line are increasingly observed but remain poorly characterized surgically
Aim: LTN decompressions focusing on lesions identified by targeted clinical examination and electrodiagnostic localization
Material & Methods: We retrospectively reviewed seven consecutive patients who underwent LTN decompression for isolated LTN palsy. Data on demographics, injury mechanism, time from onset (DOI) to surgery (DOS), preoperative physical exams, LTN motor conduction studies, needle EMG, and standardized questionnaires (VAS, DASH, QOL, PCS, SF-12) were collected. The nerve was explored and decompressed at the segment identified by focal tenderness, Tinel's sign, and conduction block. Six patients had a mid-axillary hourglass deformity, and one had a middle scalene/Erb's point lesion. Time to first documented clinical recovery and follow-up duration were recorded.

Results: The average age was 40 years (range 21–67); all patients were right-hand dominant. Five of seven palsies (71%) resulted from traction or overload mechanisms, like military load bearing, carrying, pulling, or weightlifting, while two (29%) were idiopathic. Six patients (86%) had a symptomatic mid-axillary lesion, one had a proximal scalene/Erb's point lesion. The mean time from DOI to DOS was 12.4 months (range 4.1–25.3). Preoperative pain was significant, with an average VAS score of 6.9 and median 8/10. LTN compound muscle action potential amplitudes on the affected side averaged 45% of the unaffected side (range 5–84%), with chronic neurogenic motor unit changes in the serratus anterior in all cases. Recovery was documented immediately in 2 cases and up to 12 months later, most showed improvement within 6–8 months.

Conclusions: LTN decompression targeting the symptomatic segment, often a mid-axillary hourglass compression rather than an isolated proximal scalene entrapment, resulted in significant clinical improvement even more than 12 months (up to over two years) after onset. Distal mid-axillary lesions, commonly seen in traction-related cases, were reliably identified by LTN conduction studies and focal tenderness/Tinel signs. Decompression at the compression site allowed recovery despite the delay.

A-0858 HAND INJURIES IN HORSE RIDING: CURRENT SITUATION IN FRANCE, CLINICAL RESULTS AFTER ONE YEAR, AND PROPOSALS FOR PREVENTION MEASURES

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Introduction: Horse riding, France's fourth most popular sport, is accident-prone. Hand injuries, which are less well known, can be serious, such as ring finger injuries to the thumb.

Aim: Our study, conducted under the auspices of the FESUM (Federation of Emergency Hand Services), aimed to identify these accidents on a national scale over a two-year period, analyze clinical outcomes, and establish preventive measures.

Material & Methods: Our retrospective multicenter study included 194 injuries over 27 months in 34 centers. A prospective follow-up cohort of 17 patients was conducted with an average follow-up period of 14 months (4–22). Each accident was studied according to the epidemiological characteristics of the patient, horse, and context. The clinical evaluation focused mainly on: PRWHE score, Spicher sensitivity scale, Kapandji opposition, subjective hand function, pain/dexterity score specific to horse riding, psychological impact, and resumption of activities. The equine sector was contacted via the French Equestrian Federation (FFE) and the French Institute of Horses and Horse Riding (IFCE).

Results: The national survey identified 47% of cases of major injuries (ring finger, open fracture, wound) mainly caused by lunging, falling, biting, and crushing. Our prospective follow-up cohort included 8 ring finger injuries to the thumb. The average age was 34 (15–62), 60% were at gallop level 7. 12% were wearing gloves. 65% of accidents occurred on

foot. Only the context significantly differentiated major injuries from others. The average PRWHE score for major injuries was 42 (6-87) compared to 16 (0-56) for other injuries ($p=0.03$), and subjective manual function was 48% (2-80%) compared to 84% (70-100%) ($p=0.01$). Twenty-four percent stopped riding, and 18% underwent professional retraining. Several levels of prevention were identified: national (posters, articles in equine journals, educational videos), regional (instructor training), local (information, stickers on van doors, identification of risky situations), and individual (gloves, constant vigilance).

Conclusions: Hand injuries in horse riding mainly occur when moving on foot. Lunging causes thumb ring finger injuries with uncertain and variable outcomes, impacting these young patients for life. Prevention is multi-level: national, regional, local, and individual. The impact of the actions taken will need to be evaluated in the future.

A-0860 PEDICLED LATISSIMUS DORSI MYOCUTANEOUS FLAP FOR RECONSTRUCTION OF A LARGE UPPER-ARM DEFECT FOLLOWING HIGH-ENERGY TRAUMA WITH COMPROMISED LIMB PERFUSION

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Background: High-energy upper-extremity trauma with vascular compromise, skeletal injury, infection, and large soft-tissue loss requires a reconstruction strategy that prioritizes both limb perfusion and stable coverage. Free-flap reconstruction is often considered, but in cases of unstable arterial circulation, microvascular anastomosis may jeopardize both the flap and the limb. Pedicled latissimus dorsi (LD) flaps offer a reliable alternative with robust perfusion and long arc of rotation. Case Description: An 18-year-old male sustained a motorcycle accident resulting in a humeral shaft fracture, distal radius fracture, complete radial nerve transection, and brachial artery injury with critically impaired limb perfusion. The patient underwent multiple brachial artery embolectomies, before distal circulation was stabilized. The humerus and radius fractures were repaired by orthopedics with plate and screws, and radial nerve was repaired with sural nerve graft at proximal segment. In the early postoperative period, extensive skin and muscle necrosis occurred, resulting large *Pseudomonas*-positive defect extending from the upper-arm to the antecubital region, with exposure of humeral plate and nerve graft.

As reconstruction plan, free flap reconstruction was considered unsafe due to repeated embolectomies, which indicated a high-risk recipient vessel environment and because microvascular repair was regarded as potentially compromising circulation both the limb and the flap.

Surgical Technique: After debridement, pedicled latissimus dorsi myocutaneous flap was elevated on the thoracodorsal pedicle and was transposed anteriorly through tunnel created in axillary region. Latissimus dorsi muscle was sutured to the distal and proximal ends of the defective biceps muscle for providing stable coverage of the exposed plate and nerve graft without requiring implant removal. Following inset of muscle, a split-thickness skin graft was applied.

Outcome: The flap survived completely, limb perfusion remained stable, and infection resolved with antibiotics with no complication. The patient showed progressive functional recovery at 3-months follow-up. no further wound complications or hardware exposure occurred.

Conclusion: This case illustrates that in patients with trauma-related vascular instability—particularly when repeated embolectomy has been performed on recipient vessels—the pedicled latissimus dorsi flap is a safe and valuable reconstructive option. Its long arc of rotation allows coverage up to the antecubital region, enabling durable soft-tissue reconstruction without removing infected hardware and eliminating the risks associated with free-tissue transfer in a circulatory-compromised limb.

A-0861 THE INFLUENCE OF SURGICAL APPROACH ON THE CORRECTNESS OF CORONOID PROCESS OSTEOSYNTHESIS OF THE ULNA

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Introduction: Osteosynthesis of the coronoid process of the ulna remains one of the most technically challenging operations in the elbow joint area. This is primarily due to the fear of damaging arteries and nerves located in the cubital region. At the same time, the ulnar and radial approaches do not provide adequate visualization of this anatomical structure.

Aim: The aim of the study was to evaluate the results of treatment in patients with coronoid process fractures from the perspective of the influence of the surgical approach.

Material & Methods: From 2014 to 2025, 12 patients with coronoid process fractures underwent surgery. Of these, 4 had simultaneous intervention for a radial head fracture. In 8 cases, osteosynthesis was performed using a plate. In 4 cases, osteosynthesis was performed with Herbert-type screws and anchor fixators.

The evaluation of osteosynthesis results based on computed tomography data was carried out according to such criteria as the severity of residual intra-articular displacement, deviation of the plate position from the long axis of the bone, diastasis between bone fragments in the area of the articular surface of the coronoid process, and the presence of a metal fixator in the joint cavity.

Results: Analysis of computed tomography scans showed that when using the medial approach to the coronoid process of the ulna, the surgical team more often encountered technical difficulties in repositioning and installing metal fixators. This primarily concerned the use of plates.

Analysis of osteosynthesis results from the medial approach showed that the surgical team faced the impossibility of correct plate positioning along the bone axis and adequate implant fit was not achieved – 75% of cases. The approach did not allow for the insertion of proximal screws – 25% of cases, which subsequently led to osteosynthesis instability. Distal screws could not be inserted into the plate – 25% of cases.

Conclusions: In the case of using the anterior approach, due to better visualization, repositioning and osteosynthesis did not present significant technical difficulties, which in turn led to a higher quality of osteosynthesis and the absence of complications associated with incorrect metal fixator placement.

A-0862 USING AN ANTERIOR MEDIAL ANTEBRACHIAL CUTANEOUS Y-GRAFT FOR COMMON DIGITAL NERVE RECONSTRUCTION: OUTCOMES

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Introduction: Repairing a common digital nerve (CDN) at the proper digital bifurcation presents technical challenges, as it requires connecting a single proximal nerve to two distal proper digital nerves while ensuring minimal size mismatch and low donor site morbidity.

Aim: evaluates the outcomes of reconstruction utilizing an anterior medial antebrachial cutaneous (MABC) Y-graft.

Material & Methods: We reviewed six patients with CDN injury at the bifurcation (zone 2-3), repaired with an anterior medial antebrachial cutaneous (MABC) Y-autograft. The patients, averaging 30 years (range 20–66), sustained injuries from glass, metal, screwdrivers, or knives; one had a concomitant FDS injury. Graft lengths averaged 4.5 cm (range 4–5 cm). The injury-to-surgery interval was 64 days (range 9–175). Follow-up averaged 5.2 years (range 1.5–7.3). Outcomes included Mackinnon–Dellon sensory grading and two-point discrimination.

Results: All patients achieved $\geq$ S3 sensibility: S3 (n=2), S3+ (n=2), S4 (n=2). Mean moving 2PD was 5.5 mm (median 4.5; range 4–10) and mean static 2PD 8.2 mm (median 6.5; range 5–15); 100% achieved static 2PD $\leq$ 15 mm. Donor-site morbidity was 0% (no persistent pain, dysesthesia, or functional complaints), and no donor-site treatments were required. Conclusions: The anterior MABC Y-graft provides reliable sensibility with excellent discrimination and negligible donor morbidity for 4–5 cm CDN defects at the bifurcation, including delayed presentations. A caliber match, same-field harvest, and a single proximal coaptation with two distal limbs make this technique a practical option when conduit length is exceeded or an allograft is unavailable

A-0863 RECOVERING CRITICAL ULNAR SENSATION: MEDIAN TO ULNAR SENSORY NERVE TRANSFER - SURGICAL TECHNIQUE AND CASE SERIES

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Introduction: Achieving sensory recovery after ulnar nerve repair or grafting remains challenging. Distal nerve transfer may offer a more reliable option with consistent outcomes.

Aim: Our study presents a new surgical technique for transferring the distal median nerve to the ulnar sensory nerve and reports its results.

Material & Methods: Between 2023 and 2024, four men and one woman with ulnar nerve injury proximal to the wrist following primary repair and unsuccessful sensation recovery were treated with distal median to ulnar sensory nerve transfer. They were monitored for at least 12 months. Donor nerves included the ulnar digital nerve of the long finger with the associated dorsal cutaneous branch of the median nerve (LF-UDN-DC). Recipient nerves were the ulnar hypothenar, the proper digital nerve of the small finger, and the fourth common digital nerve. Sensory recovery was assessed using the British Medical Research Council (BMRC) Scale, as modified by Mackinnon and Dellon.

Results: Five patients with failed sensory ulnar nerve recovery underwent LF-UDN-DC. The average age was 37 years (range, 18–55). The mean time from injury to surgery was 3 years (range, 9 months – 9 years). Three patients achieved BMRC S3+ sensation, one reached S4 sensation, and one had S2 sensation.

Conclusions: LF-UDN-DC to ulnar critical sensation nerve transfer is an effective technique for enhancing sensory recovery after failed ulnar nerve repair

A-0864 PRECISION APPLICATION OF MESENCHYMAL STEM CELLS ENHANCES FUNCTIONAL RECOVERY IN CRITICAL PERIPHERAL NERVE REPAIR

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Introduction: Peripheral nerve gaps remain a major reconstructive challenge, frequently resulting in incomplete motor recovery despite advances in microsurgical techniques. Autologous nerve grafts remain the clinical gold standard, yet outcomes are variable and donor-site morbidity limits their widespread use. Acellular nerve allografts (ANAs) offer an alternative that preserves the native extracellular matrix architecture, but their performance is inconsistent, especially in critical-sized defects. Mesenchymal stem cells (MSCs) have emerged as a promising adjunct to enhance axonal regeneration

and functional recovery. Among MSC populations each offer distinct advantages, adipose-derived stem cells (ADSCs) are abundant and easily harvested, bone marrow-derived stem cells (BMSCs) are well studied but require an invasive harvest, and olfactory ecto-mesenchymal stem cells (OSCs) exhibit inherent neurogenic properties. Despite growing interest in MSC-based augmentation, in vivo comparative data evaluating the functional impact of these MSC lineages remain limited. **Aim:** To compare the effects of ADSCs, BMSCs, and OSCs delivered to autografts and allografts on motor functional recovery following repair of a critical-sized sciatic nerve defect in rats. This study addresses two major clinical challenges: (1) improving the regenerative capacity of allografts to match autografts and (2) enhancing outcomes achieved with the current gold-standard autograft.

Methods: A 10-mm sciatic nerve defect was created in Lewis rats and repaired using either reversed autografts or ANAs. Each graft type was tested alone or combined with 1×10^6 MSCs (ADSCs, BMSCs, or OSCs) delivered in fibrin hydrogel. 10 Animals per groups underwent standardized postoperative assessments over 12 weeks. Primary outcomes included isometric tetanic force (ITF) of the tibialis anterior and compound muscle action potential (CMAP) amplitudes. Secondary outcomes included tibialis anterior wet muscle weight and ultrasound cross-sectional area to evaluate denervation atrophy and reinnervation. All results were normalized to the contralateral limb. Statistical analysis was performed using one-way ANOVA with post hoc correction for multiple comparisons.

Results: At 12 weeks, all MSC-treated groups demonstrated improvement in CMAP ratios; however, only OSC-treated allografts (53.1%) achieved a significant increase compared with allografts alone (39.4%) ($p < 0.05$) and were comparable to autografts (51.6%) ($p > 0.5$). When added to autografts, both OSCs (60.5%) and BMSCs (61.4%) produced significantly higher CMAP ratios than autografts alone ($p < 0.05$). Although all MSC-treated groups showed trends toward higher muscle force and muscle mass, differences were not statistically significant between groups. Ultrasound-derived muscle cross-sectional area showed a trend for MSC treated grafts but no significant differences between groups was founded at 4, 8, or 12 weeks.

Conclusion: This study demonstrates that MSC lineage meaningfully influences peripheral nerve regeneration. OSCs and BMSCs delivered in fibrin hydrogel improved motor functional recovery, with OSCs producing the strongest effects. Importantly, MSC delivery via fibrin hydrogel offers a practical, surgeon-friendly method that integrates seamlessly into standard nerve repair procedures, supporting clinical translation. Because OSCs can be harvested under local anesthesia in humans and possess inherent neurogenic potential, they represent a particularly promising candidate for next-generation regenerative strategies in peripheral nerve repair.

A-0865 HEADACHE AS A PROGNOSTIC MARKER IN NEUROGENIC THORACIC OUTLET SYNDROME

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Introduction: Headache is a common yet often overlooked symptom of neurogenic thoracic outlet syndrome (NTOS). Compression of the cervical plexus and greater occipital nerve (GON) by the scalene muscles is believed to contribute to these headaches.

Aim: This study examined whether headache in NTOS patients predicts failure of conservative treatment and a greater likelihood of requiring surgical decompression

Material & Methods: A retrospective review of 116 patients diagnosed with NTOS between January 2019 and July 2025 was performed according to CDC criteria. Functional assessments included the Brief Pain Inventory, Pain Rating Index, SF-12, and Pain Catastrophizing Scale. All patients completed at least 6 months of structured rehabilitation. Patients needing

surgical decompression were classified as Group A; those who improved with conservative management formed Group B. Results: Seventy-nine patients (68%) underwent surgery (Group A), while 37 (32%) improved with conservative treatment (Group B). Group A had a longer average duration of disease (3.91 years vs. 1.38 years, $p < 0.0002$). The occurrence of headaches was significantly higher in Group A (56%) compared to Group B (5.4%, $p = 0.0005$). Structural anomalies were more common in Group A (64% vs. 16%, $p < 0.0001$). The presence of headaches doubled the risk of needing surgery (RR = 2.06, 95% CI 1.6–2.76, $p < 0.0001$).

Conclusions: Headaches in NTOS patients appear to predict failure of conservative management and the need for surgical decompression. Headache may serve as a prognostic marker in NTOS and could justify early surgical evaluation in certain patients

A-0866 UPPER LIMB EXTRA-DIGITAL GLOMUS TUMOURS: 28 YEAR EXPERIENCE FROM TWO REGIONAL CENTRES
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Glomus tumours account for 1-5% of all soft tumours of the hand. Classically they have been described in the subungual region but can occur anywhere (both cutaneous and visceral locations). Glomus tumours are usually benign entities, but malignant and unknown malignant potential subtypes have been described.

To describe demographics and outcomes between 1997-2025 of upper-limb extra-digital glomus tumours and conduct a literature review of the presentation and management of extra-digital glomus tumours.

Retrospective review of patients with a pathological diagnosis of glomus tumours within two regional plastic surgery units. Patient demographics and clinical information (presentation, investigations, management and recurrence) were collected. 153 patients were identified with pathological diagnoses of glomus tumour. Of these 75 (49%) were extra-digital with 35 (47%) in the upper limb. Thirty (86%) were male with a median age at histopathological diagnosis of 57 years (range 16-90 years). Ten (29%) patients had documented pain as their presenting complaint; one patient (3%) had Neurofibromatosis type 1. For two (7%) patients these were recurrent lesions. One patient had a wider excision for a malignant cutaneous glomus tumour in the arm after sarcoma multi-disciplinary discussion followed by a staging CT. Median follow up was 6 weeks (range 2-16 weeks).

Extra-digital glomus tumours were more common in men while digital tumours were more common in women. Overall extra-digital tumours may be more frequent than previously quoted in the literature (up to 34%) whereas we found this rate was higher (49%). We demonstrated a predominance in the upper limb compared to the lower limb in the global literature. Pain was a common presenting complaint and glomus tumours should be considered in the differential of painful subcutaneous lesions. Definitive diagnosis can only be gained histologically and this can help distinguish between benign, malignant and metastatic deposits from glomus tumours.

A-0867 FLEXOR TENDON REPAIR SURGERY USING A DOUBLE-STRAND TECHNIQUE – A BIOMECHANICAL ANALYSIS
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Introduction: Tendon injuries are a common cause of emergency department visits, mainly affecting young, working-age men, and leads to a substantial socio-economic burden. Surgical repair remains challenging, with rupture rates ranging

from 4 to 18 percent, possibly due to variations in surgical technique, suture material and rehabilitation protocols. Increasing the amount of core strands has been shown to enhance repair strength but may negatively affect tendon healing and gliding resistance. Tendon repair techniques have been extensively studied, with the consensus being the use of a four-strand core suture with an epitenon suture for additional strength and minimizing bulkiness.

Aim: This study investigates whether a 6- or 8-strand technique can provide sufficient tensile strength to eliminate the need for an epitenon suture, as to simplify the repair.

Material & Methods: Hundred twenty human Flexor Digitorum Profundus (FDP) tendons were harvested from donated fresh-frozen anatomical specimens and divided into six groups: Adelaide (4-strand) without epitenon, Adelaide (4-strand) with epitenon, 6-strand without epitenon, 6-strand with epitenon, 8-strand without epitenon and 8-strand with epitenon. Suturing was done in zone 2 and the cross-sectional area (CSA) was measured before and after suturing. Biomechanical testing was conducted using an axial testing machine. Load to failure (N) was recorded by the testing machine, and the cause of failure was documented for each reconstruction.

Results: The Adelaide with epitenon, 6-strand with epitenon and 8-strand with epitenon groups showed a significantly higher load to failure than the Adelaide without epitenon group. The 6- and 8-strand without epitenon had a higher load to failure than the Adelaide without epitenon but did not significantly differ from any group. The observed failure causes were suture breakage and pull-out, with breakage being the primary cause of failure in most experimental groups. In the 6-strand without epitenon group pull-out was the most observed failure cause. The cross-sectional area (CSA) increased the most in the Adelaide with epitenon group. The CSA of the Adelaide with epitenon group and 8-strand with epitenon group increased significantly more than the 6-strand without epitenon group.

Conclusions: This study found that the 6-strand without epitenon did not differ significantly from the groups with epitenon sutures, while having a significantly lower increase in CSA than both the adelaide with epitenon group and the 8-strand with epitenon group. With a comparable load to failure, lower increase in CSA and increased simplicity, the technique could reduce operative time while maintaining repair strength.

A-0868 ENDOSCOPIC FASCIOTOMY IN CHRONIC EXERTIONAL COMPARTMENT SYNDROME OF THE FOREARM; REPORT OF THE FIRST NATIONAL SERIES AND USE OF A 3D PRINTED PROTECTOR

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Introduction: Chronic exertional compartment syndrome of the forearm (CECS) is usually associated to sports that require prolonged grip strength, it's been mostly reported in competitive motorcycling, affecting up to 8.9% of riders. It presents with pain, paraesthesia and loss of strength, within minutes of starting physical activity. It's caused by muscle expansion within an inelastic fascial envelope. Currently the gold standard of treatment is open fasciotomy. Endoscopic fasciotomy is a newer technique with promising results, though complications are not uncommon and are mostly associated to injury to the nerves and venous plexus in the subcutaneous tissue.

Aim: Report the results of the first national series of endoscopic fasciotomies, comparing it to existing literature, and to describe the use of a 3D printed protector for subcutaneous structures when using an endoscopic carpal tunnel release device

Material&Methods: We reviewed clinical files of all the patients treated for CECS of the forearm using the Smartrelease system, at one hospital, by one surgical team, between 2023-2025. We included patients between 15-65years of age, diagnosed clinically and with functional MRI, with a normal electromyography, at least 3 months of nonsurgical treatment,

and with at least two post op check-ups. We excluded patients with traumatic injuries within 30 days of the surgery, anticoagulant users, patients with previous surgeries in the operated forearm and those who chose not to participate. We evaluated pain, symptoms resolution, return to sports, complications (nerve injury, haematomas, infection, wound complications) reoperations, and patient satisfaction.

Results: We had 7 patients, 13 forearms, all male, between 15-42years old, 6 were competitive motorcyclists and one was a competitive karting driver. All had bilateral symptoms lasting over 18months, with partial or no response to physical therapy and medication. The follow up period was 6-26 months. All patients had complete resolution of their symptoms, without pain at their last evaluation, all returned to sports at the same or higher level between 3-5 weeks. One patient had a haematoma that didn't require surgical draining, there were no nerve injuries nor patients reporting areas of hypoesthesia. There were no re-interventions during the follow-up period all patients reported been fully satisfied with the results.

Conclusions: This is a condition with a high prevalence among specific groups. When surgical treatment is needed, endoscopic fasciotomies allow for a better aesthetic result and shorter recovery time, with a high success rate and without higher complication rates. Our series had results that match those reported in previous endoscopic series, with a tendency towards fewer complications. Since most complications arise from injuries to subcutaneous structures and there is no published method to protect them while using the Smartrelease system, we designed and 3D printed a protector to be placed between the subcutaneous tissue and the fascia, made with a clear resin that can be re-sterilized. Which also allowed for an easier and shorter surgical time. Although larger prospective studies need to be conducted, we believe this technique and continuing to use of our 3D printed protector will allow for better results with fewer complications.

A-0869 SMITH TYPE FRACTURES FAILURE- IS IT LOSS OF REDUCTION OR MALREDUCTION? ANALYSIS OF 20 PATIENTS

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Introduction: Volarly displaced intra-articular fractures of the distal radius, historically described as Smith type, volar Barton, or Goyrand fractures, are common injuries. Their classical description has focused mainly on displacement of the volar fragment. The AO Manual, an internationally important reference for fracture management, recommends wrist hyperextension and traction to reduce the volar fragment, followed by buttressing with a volar plate. Nevertheless, these fractures are prone to failure after osteosynthesis, typically by volar subluxation of the wrist. The role of the volar-ulnar fragment has recently been emphasized and dedicated volar-ulnar plates have been introduced, although failures continue to be reported.

Aim: We analyzed a series of patients treated for palmar subluxation of the wrist after osteosynthesis of Smith-type fractures to better understand the underlying displacement pattern.

Material & Methods: CT scans of 20 patients treated for postoperative palmar subluxation were evaluated. For each patient, the initial fracture CT, postoperative CT, and the healthy contralateral side were compared. Each radius was assessed in three sagittal planes passing through the lunate fossa, the dorsal ridge, and the scaphoid fossa.

Results: In all patients, injury-related dislocation involved not only the volar fragment but also additional structural components:

Dorsal cortex – shortening of the dorsal edge with bending, fissure, or comminution.

Central fragment – palmar tilt.

Cancellous bone – compression beneath the central fragment.

Buttressing of the volar fragment alone, without reduction of the central fragment, resulted only in narrowing of the articular surface while leaving the displacement uncorrected.

Conclusions: Volarly displaced intra-articular fractures of the distal radius exhibit a complex dislocation pattern involving not only the volar fragment but also the central and dorsal portions of the radius.

A-0870 KIENBOCK DISEASE: CUSTOM MADE PROSTHESIS VERSUS LUNATE OSTECTOMY, PRELIMINARY RESULTS

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Introduction: Kienböck's disease, remains a challenging condition for hand surgeons, particularly in advanced stages where reconstruction of the lunate is no longer feasible. Traditional prosthetic replacements have shown limited success due to unpredictable complications such as dorsal subluxation, overstuffing, and proximal scaphoid necrosis. Recent technological advancements have enabled the development of 3D-printed custom-made lunate prostheses capable of reproducing the patient's native anatomy. Yet, stabilization of the implant remains a critical determinant of clinical success. This study introduces an innovative fixation concept consisting of a double-stabilization technique that combines a three-ligament tenodesis with an anteroposterior tendon-based stabilization through a dedicated intra-prosthetic tunnel.

Aim: The aim of this study was to evaluate the feasibility, radiographic stability, and clinical outcomes of a custom-made 3D-printed lunate prosthesis combined with a novel dual-stabilization technique for the treatment of Lichtman stage IIIA-B and Bain-Begg stage 2B Kienböck's disease in young and active patients, versus the simple lunectomy associated to the three-ligament tenodesis.

Material & Methods: Three patients (three female aged 56, 46 and 51 years) with symptomatic stage IIIA-B/2B Kienböck's disease were treated with a lunectomy and three ligament tenodesis in group A; eight patients average age 36 years old (7 males, 1 women) were treated with a custom-made titanium-nitrided lunate prosthesis designed using bilateral wrist CT scans with 0.6 mm slices, allowing reconstruction of the pre-morbid lunate morphology in group B. Surgical technique included dorsal wrist exposure, excision of the necrotic lunate, and harvesting of a hemi-flexor carpi radialis (FCR) tendon. Stability was achieved by a three-ligament tenodesis reconstructing scapholunate and lunotriquetral constraints, and an additional tendon limb passed through an anteroposterior prosthetic tunnel to prevent rotational and sagittal-plane instability. In case of the simple osteotomy only the TL has been performed. Postoperative evaluation included radiographs, clinical examination, range of motion measurements, and functional outcome scores (VAS, QuickDASH, PRWE, Mayo Wrist Score) in both groups.

Results: In group A at a minimum follow up of 6 months all patients had a pain reduction, good satisfaction level, good recovery of range of motion, no migration of the capitate, medium strength. In group B at a minimum follow-up of 6 years, all patients exhibited significant pain reduction and high satisfaction levels. Functional scores improved consistently across all standardized measures. Wrist strength remained comparable to preoperative values, enabling full return to work or regular activities. Range of motion increased overall compared to preoperative status, although residual flexion deficit (approximately 30–35%) was observed. No cases of implant migration, dorsal subluxation, or mechanical complications were identified. Radiographs confirmed stable carpal alignment and preserved implant positioning.

Conclusions: Preliminary results suggest that the simple lunate osteotomy associated to the three ligament stabilization can be a valid solution in elder patients; a custom-made 3D-printed lunate prosthesis combined with a dual-stabilization technique represents a promising alternative to traditional salvage procedures in selected young patients. The method appears to ensure both anatomical congruity and dynamic stability, avoiding early complications commonly associated with previous implants. Longer follow-up and larger cohorts are required to validate durability, functional outcomes

A-0871 PREDICTING THE LEVEL OF FUNCTION IN PATIENTS WITH DISTAL RADIUS FRACTURE

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Introduction: Fractures of the distal radius (DRF) are frequent in the elderly population. The aetiology is typically a low-energy trauma, most often caused by a simple fall on an out-stretched hand. The injury is usually treated with cast immobilization, if the fracture is nondisplaced or minimally displaced, whereas displaced and unstable fractures require surgical fixation in patients with moderate to high level of function.

Despite being a common fracture type, there is still an ongoing debate regarding the optimal treatment regime, especially for patients over 65 years of age.

The choice of treatment largely depends on the patient's level of activity and functional demands.

In the Capital Region of Copenhagen, Denmark, the Clinical Frailty Scale (CFS) has been implemented to estimate the level of function and frailty in patients with DRF. Based on this assessment, the appropriate treatment regime is selected. The CFS was originally developed to assess patients before admission in the geriatric population. In recent years, it has become increasingly used, especially in the orthopaedic surgical settings. However, the reliability of CFS has not yet been investigated in patients with distal radius fractures (DRF).

Aim: To investigate the reliability of the CFS between hand surgeons, patients and healthcare providers. We hypothesized that healthcare providers and hand surgeons would show good agreement in their assessments, as measured by the Intraclass Correlation Coefficient (ICC).

Material & Methods: A total of 100 patients were prospectively included in the study during their visit to the outpatient clinic.

Each patient was assessed using the CFS; by two different hand surgeons, a staff nurse, and by self-assessment.

Following the visit, the patients were contacted by telephone and assessed a final time by the primary investigator.

In total, each patient underwent five independent CFS assessments.

ICC were calculated for all observations with sub analysis; with and without patients' own observation, and with and without the nurses' observations.

For all the observation, ICC were calculated using a one-way random effects model.

Results: Preliminary results show an ICC 0.81 (0.75 - 0.86) indicating a good agreement between the different raters, with even higher agreement ICC 0.83 (0.77 - 0.87) observed when calculations were limited to healthcare providers only.

Conclusions: With the preliminary results showing good agreement in the assessment of patients' CFS levels, we believe that the reliability of the CFS is sufficient to assess frailty in patients with DRF.

A-0872 THUMB HYPOPLASIA GRADE IIIB: POLLICIZATION OR RECONSTRUCTION?

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Introduction: Various surgical techniques are available for the surgical reconstruction of congenital hypoplastic thumbs. For hypoplasia Manske grade IIIB and higher, the consensus treatment is generally excision of the hypoplastic thumb and pollicisation of the index finger. This dogma has been challenged with the evolution of new surgical techniques arising

from asian countries such as China, where preservation of a five-fingered hand is an important social requirement.

Aim: The aim of the study is to critically evaluate the literature on reconstruction for grade IIIB thumb hypoplasia, report on a modified technique of microsurgical reconstruction preserving both five-fingered hand and foot and compare the functional results to those of pollicization.

Material & Methods: We present the case of a one-year old girl born with grade IIIB thumb hypoplasia on the left side. Furthermore she had bilateral radial longitudinal deficiency Baine and Klug Stage 1 and thumb hypoplasia grade II on the right side. The parents refused pollicisation and insisted on reconstruction of the left IIIB thumb. The proximal 2/3 of the first metacarpal were absent and there was no sign of intrinsic or extrinsic muscles. Ultrasound revealed a plantar dominant perfusion of the second toes.

Results: The first metacarpal base was reconstructed by a vascularized 2/3 distal osteo-cutaneous second metatarsal bone from the ipsilateral foot in a reversed manner, the metatarsal head forming the neo CMC1 joint. Arterial flow was established retrogradely by end-to-end anastomosis of the hypoplastic radial artery to the distal second plantar metatarsal artery due to the short pedicle length and the perfect calibre match. The pollex abductus was released and the MCP joint stabilised by timberication of the ulnar collateral ligaments. The donor site at the foot was reconstructed by translation of a pedicled split third metatarsal. The WIMEC score improved from pre-operative 9/25 to 19/25 postoperatively. Gait and aesthetics of the donor site at the foot with preservation of all five toes were considered excellent. A second stage abductor digiti minimi transfer was performed at the age of three, further improving the WIMEC score to 21/25.

Conclusions: Decision-making when treating severe congenital thumb hypoplasia should account for the parents's wishes and for what's technically possible in a safe way in order to achieve a good functional result. Reconstruction of IIIB thumb hypoplasia can be achieved using a retrogradely perfused microvascular second metatarsal, reaching a functional result comparable to pollicisation, and preserving a five-fingered hand.

A-0873 CROSSED CANNULATED SCREWS FOR PHALANGEAL FRACTURES: A NOVEL FIXATION TECHNIQUE

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Introduction: Unstable proximal phalangeal fractures remain a fixation challenge, with K-wires often associated with suboptimal stability, infection risk, and stiffness. Headless cannulated screws have gained popularity for their potential to enable early mobilisation, but conventional linear configurations may provide inadequate rotational control or axial compression. This study presents a technical case series using a crossed configuration of cannulated screws aimed at achieving absolute stability, preserving soft tissues, and promoting functional recovery.

Aim: To evaluate the feasibility, stability, and early clinical outcomes of crossed cannulated screw fixation in managing unstable proximal phalangeal fractures.

Material & Methods: Eight adult patients with closed, displaced proximal phalangeal fractures were treated using crossed 1.3–1.7 mm headless cannulated compression screws. A dorsal approach was selected based on fracture orientation. Temporary K-wires were used to maintain reduction and to guide screw trajectories, achieving a crossed configuration under fluoroscopic control. All procedures were performed under tourniquet. Patients began immediate mobilisation with formal hand therapy. Data collected included active range of motion (AROM), pain, return to function, and complications. **Results:** Nine patients (six male, three female; mean age 42 years, range 18–74) underwent cross-configuration screw fixation for proximal phalangeal fractures. All injuries were closed.

The little finger was involved in seven cases, with single cases affecting the ring finger and thumb. Fracture configurations

comprised transverse ($n = 5$), transverse with impaction ($n = 2$), spiral ($n = 1$), and comminuted ($n = 1$). Functional recovery was assessed using serial hand-therapy measurements. At 6 weeks, the mean total active motion (TAM) was $174^\circ \pm 62$ (median 182°), and mean active range of motion (AROM) was $190^\circ \pm 64$. At 3 months, mean TAM was $176^\circ \pm 35$ and AROM $206^\circ \pm 17$. At 6 months, only one patient had recorded data (TAM 154° , AROM 198°), with others discharged earlier after achieving functional goals. One patient developed symptomatic hardware irritation and underwent elective screw removal. No infections, fixation failures, tendon adhesions, or unplanned reoperations were recorded. All fractures achieved clinical and radiographic union. Several patients were discharged from therapy before 6 months due to satisfactory functional recovery. Conclusions: Crossed cannulated screw fixation offers a stable, reproducible technique for proximal phalangeal fractures. It supports early mobilisation and shows promising early outcomes across varied fracture types. Further comparative studies are warranted.

A-0874 DORSAL CORTICAL ALIGNMENT PREDICTS FUNCTIONAL OUTCOMES IN PROXIMAL PHALANGEAL FRACTURES TREATED WITH INTRAMEDULLARY HEADLESS COMPRESSION SCREWS

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Introduction: Intramedullary headless compression screw (IMHCS) fixation is increasingly used for minimally invasive management of metacarpal and proximal phalangeal fractures. While clinical outcomes are generally favorable, the specific role of anatomical fracture reduction—particularly in proximal phalanx fractures—has not been well defined. **Aim:** To evaluate the relationship between anatomical reduction and postoperative functional outcomes in proximal phalanx fractures treated with IMHCS fixation.

Material & Methods: A retrospective review was conducted of 69 patients (41 metacarpal, 28 proximal phalanx) treated with IMHCS fixation between June 2020 and March 2025. Radiographs were assessed to classify fractures as reduced or non-reduced. Functional outcomes were measured using the Total Active Motion (TAM) scoring system. The association between reduction quality and functional outcome was analyzed separately for proximal phalangeal fractures using the Fisher–Freeman–Halton exact test.

Results: All fractures achieved radiographic union. In proximal phalangeal fractures, anatomical reduction was significantly associated with superior TAM outcomes ($p = 0.0014$; Cohen's $w = 0.802$). Patients with good functional outcomes demonstrated smooth dorsal cortical alignment, suggesting preservation of the tendon gliding surface. While metacarpal fractures also achieved high rates of good-to-excellent TAM scores, their alignment did not significantly influence outcome. **Conclusions:** For proximal phalanx fractures, achieving anatomical fracture reduction is a key predictor of postoperative function after IMHCS fixation. Cortical continuity—particularly dorsally—appears essential for maintaining optimal digital biomechanics by preserving tendon gliding. When closed reduction is insufficient, a minimal open approach should be considered to ensure correct alignment prior to screw insertion.

A-0875 RESTORATION OF DRUJ STABILITY THROUGH ARTHROSCOPIC TFCC LIGAMENT RECONSTRUCTION - A LONG-TERM OUTCOME ANALYSIS

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Introduction: Wrist stability and function depend on a precise balance between bone alignment, ligament tension and muscular coordination. Injury to the distal radioulnar joint (DRUJ) and the Triangular Fibrocartilage Complex (TFCC) disrupts this delicate balance often resulting in pain, instability and progressive osteoarthritis. The Adams ligament reconstruction aims to restore the anatomical and biomechanical harmony between the radius and ulna and therefore stabilising the DRUJ. Restoring this balance is essential not only for joint congruency but also for a stable and controlled wrist motion. This enables patients to perform everyday tasks with strength and precision. The arthroscopic approach enables an anatomical reconstruction with minimal surgical trauma. This minimally invasive approach may improve rehabilitation and reduce complications. However, long-term outcome data for the arthroscopic Adams procedure remain limited.

Aim: This retrospective study evaluates long-term outcomes of patients who underwent arthroscopic Adams ligament reconstruction. The objective was to determine whether this technique provides durable restoration of DRUJ stability and functional wrist balance. Clinical outcome parameters including wrist range of motion, grip strength, pain levels and patient-reported outcome measures (PROMs) were assessed at follow-up. The parameters were analysed to determine maintenance of DRUJ stability and functional recovery achieved with this technique.

Material & Methods: Clinical data were retrieved from follow-up visits and electronic medical records. Range of motion was measured using a goniometer and grip strength was recorded with a dynamometer. Pain levels were documented using a visual analogue scale (VAS) and functional outcomes were assessed through standardised patient questionnaires. Complications, reoperations and time to return to work were recorded.

Results: This study provides a long-term evaluation of an arthroscopic TFCC ligament reconstruction. The senior author performed a total of six arthroscopic TFCC reconstructions, of which four patients could be retrieved for evaluation. The patient cohort showed a high diversity in both injury mechanisms and postoperative recovery patterns.

Results show that TFCC stability was achieved in all reviewed patients with no cases of recurrent DRUJ instability. PROMs demonstrated a significant improvement in wrist function and daily hand use with the majority of patients expressing high satisfaction in postoperative questionnaires. Average grip strength and range of motion increased notably compared to preoperative assessments. Minor postoperative stiffness and intermittent pain were observed in a subset of patients but generally improved with ergotherapy and time. Several patients required additional surgical procedures to the wrist joint due to concomitant trauma-related conditions, but no further operations to the DRUJ needed to be performed.

Conclusions: Preliminary review indicates stable restoration of DRUJ alignment with consistent improvement in wrist function. These findings suggest that a minimally invasive technique reliably restores both biomechanical integrity and functional balance in patients with DRUJ instability. The arthroscopic procedure appears to improve the outcomes compared to open repairs.

A-0876 OSTEIOD OSTEOMA OF THE HAMATE: A RARE CAUSE OF WRIST PAIN

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Introduction: Osteoid osteoma of the carpal bones is rare, and involvement of the hamate is exceptionally uncommon. Its presentation may mimic more common wrist disorders, leading to diagnostic delay. We present a case of a proximal hamate osteoid osteoma located at the volar articular surface, emphasizing key diagnostic and surgical points.

Aim: To report a rare case of osteoid osteoma of the hamate and highlight the diagnostic challenges associated with carpal lesions, the decisive role of CT imaging, and the surgical considerations required for safe and complete excision of volar hamate lesions.

Material & Methods: A 35-year-old male presented with long-standing nocturnal right wrist pain radiating to the ulnar side of the hand, with near-complete relief after NSAIDs. Radiographs showed subtle proximal hamate sclerosis. MRI demonstrated diffuse bone marrow edema but failed to clearly visualize a nidus. CT was diagnostic, revealing a 3 mm nidus at the proximal articular surface of the volar hamate cortex. Due to the deep volar location, a palmar approach with carpal tunnel release was used to access the lesion. The nidus was excised en bloc and the cavity was cauterized. Histology confirmed osteoid osteoma.

Results: The patient experienced immediate postoperative relief of nocturnal pain. At 1-year follow-up, he remained completely symptom-free, had full wrist and hand function, and showed no recurrence.

Conclusions: Hamate osteoid osteoma is a rare but important differential diagnosis in persistent nocturnal wrist pain. MRI may be misleading, whereas CT reliably identifies the nidus and guides treatment. For volar proximal hamate lesions, a palmar approach with carpal tunnel release allows safe, complete excision. Early recognition and CT-based diagnosis result in excellent outcomes.

A-0877 DOES THE ENVELOPE OF MOTION DURING CIRCUMDUCTION REPRESENT WRIST MOTION DURING DAILY ACTIVITIES?

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Introduction: Wrist circumduction is a coupled motion that combines all extreme postures of the wrist. The circumduction envelope is the area enclosed by this movement.

Aim: The aim of this study is to assess whether wrist position during different daily activities (ADL) remains within the circumduction envelope.

Material & Methods: Kinematics of the wrist of 20 healthy right-hand dominant volunteers (mean age 28 years (SD 4.7), 10 male, 10 female) was assessed with 3D motion capture system during wrist circumduction as well as 11 different ADL. The circumduction envelope was defined by the convex hull. The amount of wrist positions lying outside the circumduction envelope was calculated for each task.

Results: **Conclusions:**

A-0878 SUPERCHARGED END TO SIDE NERVE TRANSFER FOR ULNAR NEUROPATHY: A SYSTEMATIC REVIEW

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Introduction: The Supercharged End-to-Side (SETS) nerve transfer for anterior interosseous nerve (AIN) to deep motor branch of the ulnar nerve (MUN) has become a popular choice for management of severe ulnar neuropathy lesions since first performed in clinical practice in 2012. While previous systematic reviews have looked to assess outcomes following this novel technique, the number of published cases of patients who underwent AIN to MUN SETS nerve transfer has almost doubled since early publications. For this reason, a current updated systematic review with more rigorous inclusion criteria and analysis is now indicated.

Aim: The aim of this review was to analyse the literature for outcomes of SETS nerve transfers for in-continuity lesions of the ulnar nerve.

Materials and Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were used when conducting this review. A search was undertaken using PubMed, MEDLINE, and Ovid databases. Keywords searched were: Supercharged-End-to-Side, Reverse-End-to-Side, and anterior interosseous to ulnar nerve transfer. The search was conducted in September 2022, for studies published in any year. Two reviewers (R.C and C.K) independently screened the titles and abstracts of the retrieved studies to determine their eligibility for inclusion. Duplicates, animal studies, descriptive studies, studies not relating to AIN to MUN nerve transfer, and studies reporting only on ulnar non-in-continuity lesions or end-to-end and hemi end-to-end nerve transfers were excluded. Outcome measures analysed were intrinsic MRC grade, grip strength & key pinch, Electromyography (CMAPS) and DASH score.

Results: Our literature search retrieved 173 articles from the search criteria, of which 9 studies met the inclusion criteria. Five were retrospective case series, one prospective cohort study, one retrospective cohort and two case reports.

A total of 192 patients were included. 189 of the 192 patients presented with pre-operative weakness.

Nerve compression accounted for 149 cases and other in-continuity lesions accounted for the remaining cases with 79% of all pathologies occurring at the elbow. Average post-operative follow-up was 17-months. No post-operative complications were documented.

The results that follow address patients for which outcome data were available. In 107 patients there was an improvement in key pinch strength, rising from a mean of 3.05 kg pre-operative to 4.013kg post operatively. There was an increase in average grip strength in 84 patients (18kg to 22kg). 105 patients had improvement in the MRC grading of their FDI (first dorsal interosseous), from an average of 1.38 to 3.22 postoperatively. CMAPS measures increased across 76 patients, from 2.1mV to 3.0mV. There was also a 7% improvement in DASH scores postoperatively for 86 patients.

Conclusion: The outcomes following this technique are widely positive with low complication rates. However, heterogeneity in outcome measures make interpretation difficult. Future development of large Randomised controlled trials looking at standardised outcomes for patients undergoing SETS nerve transfer is now warranted.

A-0879 COMPARISON OF THE RELIABILITY OF FRACTURE CHARACTERIZATION AND TREATMENT RECOMMENDATIONS BASED ON CT SCANS OF REDUCED VERSUS UNREDUCED DISPLACED ARTICULAR FRACTURES OF THE DISTAL RADIUS
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Introduction: Displaced articular distal radius fractures are typically reduced and splinted prior to obtaining a CT scan. The rationale is that achieving improved anatomical alignment of the fracture fragments facilitates their identification and enhances the accuracy of preoperative planning. Reduction of a displaced articular fracture of the distal radius prior to surgery may not be necessary to prevent skin and neurovascular complications. A recent randomized controlled trial (RECORDED) showed that refraining from closed reduction of displaced distal radius fractures in the emergency department is non-inferior in terms of VAS pain scores while awaiting surgery, compared to performing closed reduction. However, it remains unclear whether CT scans of unreduced displaced articular distal radius fractures are as suitable for operative planning as those of reduced fractures.

Aim: To determine if there is a difference in recognition of articulate fracture fragments and plans for exposure and fixation between CT imaging of a non-reduced compared to a reduced distal radius fracture.

Material & Methods: Members of the Science of Variation Group will assess 10 randomly selected CT scans from a set of 20 displaced intra-articular distal radius fractures scheduled for operative treatment. The full set includes 10 unreduced fractures and 10 reduced fractures. These CT scans are drawn from a randomized trial of patients aged 18 and older that compared pre-operative reduction to no reduction (RECORDED). Members will be asked to indicate the presence of key fracture fragments, to select their preferred surgical exposure, and fixation method. Inter-rater reliability for the identification of key fracture fragments will be assessed using Fleiss' Kappa for both the reduced and unreduced CT scans. A multilevel logistic regression model will be used to determine whether specific fracture fragments or the use of CT scans of reduced versus unreduced fractures are associated with recommending operative treatment, selecting a surgical approach, or choosing a fixation technique.

Results: A total of 93 surgeons completed the questionnaire. Data analysis is currently ongoing, and the results will be presented at the congress.

Conclusions: Closed reduction can be uncomfortable for patients and carries potential risks. If recognition of articular fracture fragments and the recommendations for surgical exposure and fixation do not differ between CT scans of reduced and unreduced fractures, closed reduction prior to planned operative treatment may be omitted. Such an approach may reduce patient discomfort while maintaining the quality of preoperative assessment. Conversely, if differences are observed, performing closed reduction before surgery remains justified for displaced articular fractures at the surgeons discretion, to ensure accurate assessment and planning.

A-0880 FROM 3-D PLANNING TO CLINICAL APPLICATION: EARLY OUTCOMES OF THE IXOS KLS FRAGMENT SPECIFIC DISTAL RADIUS PLATE"

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Introduction: The management of distal radius fractures has progressively advanced toward anatomically contoured implants capable of accommodating the considerable morphological variability of the distal radius. Traditional plates

may not optimally match individual anatomy, potentially impacting stability and long-term function. The IXOS KLS plate represents a new generation of fragment-specific, variable-angle locking plates developed through an innovative 3-D design process that integrates extensive anatomical datasets, experience from corrective osteotomies, and advanced virtual surgical planning. By generating and merging 100 patient-specific plates derived from highly diverse distal radius anatomies, the IXOS plate aims to deliver a universally well-fitting and biomechanically optimized fragment specific implant.

Aim: The aim of this study was to describe the design rationale of the IXOS KLS distal radius plate and report early clinical and radiographic outcomes in the first consecutive cohort of patients treated across two pilot centers.

Materials and Methods: A prospective evaluation was conducted on 30 consecutive patients undergoing fixation of distal radius fractures using the IXOS KLS plate. The cohort consisted of 18 males and 12 females, with a mean age of 46 years, months FU. The IXOS plate was engineered by selecting 100 anatomically diverse distal radii from a digital bone database, creating 100 patient-specific plates, and computationally merging them into a single optimized three-dimensional implant design. The final device is a fragment-specific plate featuring variable-angle angular-stable locking technology, allowing targeted fixation of specific fragments and accommodating varied fracture patterns while maintaining high biomechanical stability. All surgeries followed a standardized protocol. Postoperative evaluation included range of motion (ROM), grip strength, pain, complications, and radiographic healing at routine follow-ups until full functional recovery at 6 months. **Results:** Radiographic union was achieved in all 30 cases within expected timeframes, with no cases of nonunion, malunion, or implant failure. Functional outcomes were excellent, with restoration of ROM and grip strength in all patients by the final follow-up. The anatomically optimized contour of the IXOS plate helps in fixing key fragment ensuring stability and enabling early mobilization. No major complications occurred, no stiffness, hand dedicated physiotherapy for all the patients. No implant removals were required.

Conclusions: The early clinical outcomes obtained with the IXOS KLS distal radius plate confirm its effectiveness as a fragment-specific, variable-angle angular-stable implant designed through an innovative anatomy-driven process. The optimized 3-D anatomy allows improved intraoperative handling and rapid functional recovery. While larger studies with longer follow-up are needed, these pilot data suggest that the IXOS plate may represent a significant advancement in distal radius fracture fixation.

A-0882 SIMPLE EXTRACTION TECHNIQUE FOR BENT INTRAMEDULLARY SCREWS AFTER METACARPAL REFRACTURE

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Introduction: Intramedullary screw fixation has become increasingly used for the treatment of metacarpal fractures due to its minimally invasive approach, ability to provide stable fixation, and facilitation of early mobilization. Although reports show excellent functional outcomes and low rates of complications, secondary traumatic events may result in refracture and bending of the implant. The removal of bent intramedullary screws can be technically demanding and may require extensive surgical exposure, risking bone fragmentation or the need for additional fixation. Limited evidence exists regarding minimally invasive solutions for this complication.

Aim: To describe a simple, minimally invasive technique for the extraction of bent intramedullary screws in cases of metacarpal refracture and to report the outcomes of five patients treated with this method.

Material & Methods: Five patients with metacarpal refractures following previous retrograde intramedullary cannulated headless screw (RICHS) fixation who presented with screw bending were retrospectively reviewed. All procedures were

performed under regional anesthesia. The technique consisted of two steps. First, controlled manual realignment of the bent screw was attempted under continuous fluoroscopic guidance to restore a straighter trajectory of the screw and reduce the risk of implant breakage or bone injury. Second, a miniopen dorsal approach was made through the previous scar to allow introduction of a guide wire and screwdriver. Any obstructing fibrous or bony tissue at the screw entry site was gently cleared using the guide wire. Once the screwdriver engaged the cannulation of the screw, the implant was removed without opening the fracture site or exposing the diaphysis. After extraction, a new intramedullary screw of greater length and diameter was inserted. Standard skin closure with one or two simple stitches was performed, and no postoperative immobilization was required.

Results: The described technique was successfully applied in all five patients. No intraoperative complications occurred, and no postoperative complications such as infection, stiffness, or persistent pain were observed. All patients regained functional hand movement comparable to their initial postoperative course after the primary fixation. The minimally invasive approach enabled safe extraction of the bent implant while avoiding diaphyseal exposure, fracture focus opening and extensor tendon mobilization.

Conclusions: The miniopen technique combined with controlled manual realignment allows safe and effective extraction of bent intramedullary screws after metacarpal refracture. In this small series, the method avoided diaphyseal exposure, fracture focus opening, extensor tendon mobilization and postoperative complications, while enabling prompt functional recovery. Larger studies with longer follow up are needed to further validate the reproducibility and clinical applicability of this technique.

A-0883 RECYCLING FLAP PEDICLE FOR SECONDARY FREE FIBULAR TRANSFER IN COMPLEX UPPER LIMB RECONSTRUCTION

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Introduction: Composite upper limb trauma with concurrent loss of bone, tendon, and soft tissue represents one of the most demanding challenges in reconstructive surgery. Functional restoration requires stable skeletal reconstruction, supple soft-tissue coverage, and careful vascular planning, particularly in staged procedures or vessel-depleted fields.

Aim: To describe the first documented case of pedicle recycling in the upper limb and highlight its feasibility in achieving durable reconstruction and functional recovery.

Material & Methods: A 76 year old female sustained complex forearm trauma following a dog bite, with segmental radial loss, tendon disruption, and dorsal degloving. Initial reconstruction combined fixation with a non-vascularised fibular allograft and soft-tissue coverage using an anterolateral thigh (ALT) free flap. Following pseudoarthrosis of the allograft, the descending branch of the lateral circumflex femoral artery pedicle originally supplying the ALT flap was divided and reused to vascularise a free fibular flap, while the ALT flap remained in situ.

Results: The ALT flap survived independently, confirming neovascularisation, while the fibular transfer achieved osseous union. At 12-month follow-up, radiographs showed cortical continuity, the ALT flap remained well contoured, and the patient regained functional grasp and release, enabling independent hand use in daily activities.

Conclusions: Pedicle recycling offers a novel, practical option for staged upper limb reconstruction when recipient vessels are limited. This technique provides durable bony union and reliable soft-tissue cover while preserving function expanding reconstructive possibilities in complex limb salvage.

A-0884 METACARPAL ROTATION – ONE OF THE PITFALLS OF THREE-DIMENSIONAL PLANNING

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Introduction: Malunion of metacarpal fractures can lead to limitations of hand function as well as a cosmetic deformity. Patients often complain of reduced grip strength, limitations due to extension lag and scissoring of fingers due to rotational deformity.

Increasingly, three-dimensional (3D) planning has been used to help plan deformity correction. The authors have noted that in the case of metacarpal malunions although 3D planning has been very useful in demonstrating the coronal and sagittal deformities, it often does not determine adequate rotational correction. This is particularly relevant when the patient is experiencing scissoring. The study uses data from pre-operative templating to review the rotational correction versus clinical correction that was made intra-operatively.

Aim: This study aims to review the deformity sustained in symptomatic metacarpal malunions and how it compares to the patient's clinical presentation

Material & Methods: KLS Martin Individual Patient System (IPS) involves computer tomography (CT) of both hands from the distal forearm to the fingertips. The non injured hand is used as a guide for planning the deformity correction. There were 15 patients in our database. 11 (73%) patients were male and 4 (27%) females. Median age at surgery was 40.5 years. Two patients had corrections of two metacarpals (both cases were ring and little finger). The remaining had corrections of one metacarpal. Thumb metacarpal correction was done in 4 cases, index metacarpal in 2, there were no middle finger metacarpal corrections, ring finger metacarpal in 3 digits and little finger metacarpal correction in 8 digits. **Results:** The median angular correction in the sagittal plane was 37 degrees and 5 degrees in the coronal plane. Median change in length was 6.7mm. There was negligible translation. The median rotational correction was 2.4 degrees. However, in 5 cases, patients had rotational deformity. The median correction that was made at the time of the surgery to clinically correct the rotational deformity was 20 degrees. The remaining patients had no clinical rotational deformity, so no corrections were made in this plane.

Conclusions: Pre-operative planning failed to show rotational deformity in 5 cases. In two cases the rotational was 10 degrees or less. However, in the remaining cases it was quite profound and was causing symptomatic scissoring. Rotational deformity can be quite challenging to correct. In the case of distal radius or forearm shaft fracture malunions, using 3D planning has been very helpful in correcting rotational deformity. However, this study highlights that CT planning may not be able to adequately show rotational deformity in metacarpal fractures.

This is important to know when planning these operations. Clinical examination is key and should always be the main method of determining the rotational deformity. However, defining the angular correction and change in length is still a useful part of the 3D planning process. The authors note that pre-operatively working out these variables and making jigs for their correction, made it easier to clinically dial in rotation during the operation.

A-0885 CLINICAL OUTCOMES OF PATIENTS WITH SHOULDER DISLOCATION ATTENDING THE IRISH NATIONAL BRACHIAL PLEXUS CENTRE

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Introduction: Brachial plexus injuries are infrequent complications following shoulder dislocation injuries but for those patients affected, they can have serious and life changing consequences.

Aim: To categorise the management (conservative v's surgical) and outcomes of patients presenting with traumatic brachial plexus injury post shoulder dislocation attending the national brachial plexus surgery unit for Ireland In Dublin, Ireland.

Material & Methods: Retrospective review of patient chart and electronic health records of all patients referred to our services from January 2023 to December 2024 inclusive.

Results: In total, 136 patients attended our National Brachial Plexus clinic over the 2 year period. The mean age of attendees was 57.9 years. The majority were female.

The commonest cause of injury across all attendees was road traffic accidents and falls, accounting for 53% (n=72).

Patients post shoulder dislocation attending the Plexus Clinic:

- 23 patients were referred to the clinic with brachial plexus symptoms following shoulder dislocation over the two year period, accounting for 17% of all attendees. Over 80% of these patients were offered review appointments within 4 months of referral and over half were discharged within 2 years.

Mechanism and Symptoms:

- The commonest mechanisms for shoulder dislocation were falls (n=17), cycling accidents (n=3), rugby injuries (n=2) and a quad bike collision (n=1). The majority of dislocations were anterior in nature. There were 5 documented associated humeral fractures.

- All had both sensory and motor symptoms affecting the upper limb. There was an improvement in symptoms in all patients with non operative management, to varying degrees.

Outcomes:

- Two people did not attend final follow up appointments but all other individuals reviewed at clinic had made a good or excellent functional recovery. All had input from physiotherapy and occupational therapy.

- Residual defects included swan necking of digits, decreased finger flexion, fixed finger flexion, mild hand clawing, weak intrinsic, reduced shoulder movements, impaired thumb extension or abduction and paraesthesia. Some of these individuals are still under review however and are likely to improve further.

With regard to patients requiring operative treatment, 2 people required both guyon canal and carpal tunnel decompression. One patient has been listed for an opponensplasty and one patient is awaiting triceps to axillary nerve transfer.

Conclusions: Our data supports the view that the majority of patients with brachial plexus deficits post shoulder dislocation can be managed conservatively but they need to be referred to specialised centres promptly when symptoms present. These patients require intense support from physiotherapy services, particularly to prevent long-term hand deformities.

A-0886 SINGLE-CENTER CLINICAL EXPERIENCE IN DIAGNOSING AND TREATING IRRITATIVE MEDIAN NERVE SYNDROME IN PATIENTS INITIALLY CLASSIFIED AS CRPS TYPE 1

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Introduction: Complex Regional Pain Syndrome Type 1 (CRPS-1) is classically characterized by disproportionate pain, autonomic changes, and functional impairment. However, a subset of patients presents with symptoms more compatible with localized neural irritation rather than primary dysautonomia. In these cases, a subtle disruption of the balance between neural mobility, soft-tissue tension, and mechanical load distribution—particularly involving the median nerve—may play a central role. Misinterpreting this imbalance may lead to delayed treatment and progression toward disabling hand dysfunction.

Aim: To determine whether restoring neural and mechanical balance through surgical median nerve decompression results in clinical improvement in patients previously diagnosed with refractory CRPS-1, and to assess whether these cases more accurately represent a distinct entity—Irritative Nerve Syndrome (INS).

Material & Methods: A prospective single-center study was conducted on 52 consecutive patients (49 females, 3 males; mean age 48 years) previously diagnosed with CRPS-1 unresponsive to conservative treatment. All showed clinical signs suggestive of median nerve involvement. Preoperative evaluation included VAS, DASH, ultrasound imaging, electrodiagnostic testing, and ultrasound-guided selective nerve blocks to identify localized neural imbalance. All patients underwent surgical median nerve decompression. Minimum follow-up was 6 months and included repeated VAS/DASH scoring, clinical examination, and evaluation of autonomic disturbances. The interplay between pain, stiffness, and restoration of functional balance in the hand was specifically analyzed.

Results: Marked postoperative improvement was observed. Mean VAS decreased from 7.5 ± 1.9 to 2.1 ± 1.4 ($p < 0.001$) and mean DASH improved from 65 ± 12 to 22 ± 10 ($p < 0.001$). Overall clinical improvement occurred in 92% of patients. Autonomic symptoms resolved completely in 100% of cases, suggesting a secondary rather than primary autonomic disorder. Ultrasound imaging and selective nerve blocks were highly sensitive in identifying nerve entrapment, whereas electrodiagnostic studies frequently failed to detect INS. Patients presenting with pronounced finger stiffness required longer rehabilitation and reported lower satisfaction, emphasizing the need for early correction of the underlying mechanical imbalance.

Conclusions: A significant proportion of patients initially labeled as CRPS-1 may instead present with Irritative Nerve Syndrome, a localized and treatable condition resulting from an imbalance in neural and soft-tissue dynamics. Surgical median nerve decompression effectively restored functional balance, leading to substantial pain relief and functional recovery. Recognizing INS as a distinct entity may improve diagnostic accuracy, prevent chronic disability, and guide more targeted interventions aimed at reestablishing balance in hand function.

A-0887 DOUBLE CRUSH SYNDROME OF THE UPPER EXTREMITY: A SYSTEMATIC REVIEW OF MANAGEMENT AND OUTCOMES

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Introduction: Double Crush Syndrome (DCS) is a distinct clinical entity characterised by compression at two or more sites along a peripheral nerve, exerting synergistic effects towards neurological dysfunction. Diagnosis and management of DCS is challenging, often requiring multimodal investigations and cross-specialty input. Management strategies include conservative methods and surgical decompression. There is no consensus on optimal management strategies for DCS currently.

Aim: This systematic review aims to determine an optimal approach to managing patients with DCS of the upper limb and their influence on patient outcomes. To our knowledge, this is the first systematic review to synthesise evidence on this topic.

Material & Methods: Following registration on PROSPERO, a systematic literature search was performed using key words across EMBASE, MEDLINE/PubMed and CENTRAL databases until July 2025. Snowballing technique of included studies was undertaken to identify any further eligible studies. Inclusion criteria consisted of adults with a clinical or electrophysiological diagnosis of DCS of the upper limb and its management. Studies were excluded if they were

unavailable in English, involved two sites of distal compression only, included traumatic causes of neuropathy and level 4 evidence or below. Risk of bias was assessed using the Cochrane ROBINS-I V2 and ROB-2 tools. The review was conducted and reported in line with PRISMA guidelines.

Results: Out of 1506 articles identified through database searching, 9 were included in the study. One additional study was identified via snowballing technique, with 10 studies included in the final analysis consisting of 111,495 patients followed up between 6 weeks to 6 years. Studies available were primarily retrospective cohort studies at level 3 evidence with a moderate or high risk of bias. One randomised control trial examining conservative management was also included. Most studies included proximal compression with a carpal tunnel syndrome, with fewer involving ulnar nerve compression syndromes. Simultaneous dual-site surgical decompression of DCS presented potential benefits over staged procedures in terms of operative time ($p=0.04$) and temporary disability ($p=0.006$). Dual-site decompression surgery overall improved pain and functional outcomes in comparison to single-site decompression surgery alone in DCS, with statistically significant associations consistently demonstrated of variable magnitude and strength. Conservative management with a physiotherapy programme and additional cervical mobilisation improved extent of discomfort ($p=0.002$) and dexterity (0.00001) in DCS patients, but no studies compared this to surgical management. DCS patients overall had poorer outcomes compared to patients with only a single-site compressive neuropathy, demonstrating higher rates of postoperative complications and disability.

Conclusion: The management of DCS is complex, with no robust evidence to support one surgical approach over another. This study has demonstrated promising results with dual-site decompression, but revealed an overall higher rate of complications in the DCS cohort compared to single compressive pathology. Future research should focus on adequately powered prospective randomised controlled trials to establish definitive evidence.

A-0888 ULNAR NERVE SCHWANNOMA ASSOCIATED WITH ANEURYSMAL DILATION OF THE BRACHIAL VEIN: A RARE CASE

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Introduction: Schwannomas are rare benign tumors arising from the sheaths of peripheral nerves. Their diagnosis and surgical excision may present technical challenges, particularly when the tumor is intraneural. We present a case of an ulnar nerve schwannoma with notable diagnostic and surgical considerations.

Aim: To treat a rare case of ulnar nerve schwannoma complicated by a considerable dilation of the brachial vein.

Material & Methods: A 51-year-old man presented with a painless palpable mass in the right proximal arm near the axilla, with tenderness on palpation. Although the clinical findings suggested involvement of the ulnar nerve, MRI described the lesion as a possible median nerve schwannoma. An open biopsy under local anesthesia confirmed the presence of a benign schwannoma. Two months later, definitive excision was performed under general anesthesia. Intraoperatively, the tumor was found to originate from the ulnar nerve. The brachial vein exhibited aneurysmal dilation due to tumor compression and was simultaneously tethered by two branches, limiting surgical exposure; these were ligated, allowing vein mobilization. The tumor was intraneural and was excised microsurgically following meticulous dissection of all fascicular bundles. Histology confirmed the diagnosis.

Results: Postoperatively, ulnar nerve function was nearly complete, with only minimal sensory deficits. The patient returned to work 15 days later, and by 3 months had full motor and sensory recovery without signs of tumor recurrence.

Conclusions: Preoperative diagnosis of schwannomas may be misleading, as imaging does not always precisely identify the nerve of origin. Biopsy is essential. Careful microsurgical excision enables complete removal while preserving neural function.

A-0889 A NOVEL DERMAL RPNI TECHNIQUE USING BOVINE DERMAL SCAFFOLD FOR TREATMENT OF PERIPHERAL NEUROMAS: EARLY CLINICAL FINDINGS

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Peripheral nerve injuries are common and may result in painful neuromas that substantially diminish patients' quality of life. Emerging surgical strategies—such as the Regenerative Peripheral Nerve Interface (RPNI)—have demonstrated promising improvements in neuroma-related symptoms. In this study, we introduce a dermal variant of RPNI utilizing a bovine-derived, three-dimensional dermal matrix (Matriderm).

Methods: A 1-mm-thick Matriderm sheet was folded into four layers to obtain a 4-mm construct. Following neuroma excision and preparation of the nerve stump, the nerve end was secured to the dermal matrix using 8-0 Ethilon sutures. This technique was applied to various peripheral neuromas, including those involving the sural nerve, branches of the common peroneal nerve, the ulnar nerve, the median nerve, and the radial nerve. For larger-caliber nerves, fascicular division was performed to create multiple smaller units.

Results: At a mean follow-up of 8 months, patients demonstrated a reduction in pain, with average VAS scores improving from 8/10 preoperatively to 3/10 postoperatively. Additionally, the technique contributed to improvement in phantom limb pain in a patient with an above-elbow amputation.

Future directions: Although these early results are encouraging, larger studies with longer follow-up and comparative analyses are needed to validate durability, elucidate the mechanisms of regeneration, and refine patient selection to achieve optimal outcomes.

Conclusion: The preliminary outcomes of this study suggest that the dermal Regenerative Peripheral Nerve Interface (dRPNI) using a bovine-derived, three-dimensional dermal matrix is a feasible and effective technique for managing symptomatic peripheral neuromas. The approach demonstrated a clinically meaningful reduction in pain, with postoperative VAS scores decreasing substantially compared to preoperative levels, and showed potential benefits for phantom limb pain.

A-0890 THE TFCC TABLE LIFT TEST: A CLINICAL TOOL FOR DETECTING PALMER 1B TFCC LESIONS

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Introduction: Ulnar-sided wrist pain is a frequent and challenging clinical presentation, often associated with injuries of the triangular fibrocartilage complex (TFCC). Standard clinical tests, however, offer limited sensitivity and specificity, making diagnosis difficult. The TFCC plays a key role in maintaining the balance of load transmission and stability across the ulnocarpal joint; thus, undetected peripheral TFCC lesions (Palmer 1B) can significantly disrupt wrist biomechanics. Wrist arthroscopy remains the diagnostic gold standard, but the need persists for a reliable, accessible clinical tool to identify these injuries and restore functional balance.

Aim: To evaluate the diagnostic accuracy of the TFCC Table Lift Test (TTL test) in detecting peripheral TFCC lesions (Palmer

1B), and to determine the correlation between TTL test scores and arthroscopic findings using the Atzei classification. **Material & Methods:** A retrospective case-control study was conducted on 314 patients with unilateral chronic ulnar-sided wrist pain who underwent wrist arthroscopy between January 2016 and December 2023. All patients performed the TTL test during preoperative evaluation. The test involved lifting a flat surface using fingertip contact while the wrist was positioned in full supination and extension—an activity that challenges TFCC tension and highlights imbalance in ulnocarpal stability. Pain intensity was recorded with a Visual Analogue Scale (VAS, 0–10) and compared with the asymptomatic side. Exclusion criteria included bilateral pain, prior wrist surgery, or alternative wrist pathology. Arthroscopic evaluation confirmed or excluded Palmer 1B lesions and further subclassified them according to the Atzei system. Statistical correlation between TTL scores and arthroscopic findings was calculated, including sensitivity, specificity, predictive values, and ROC curve analysis.

Results: Of the 314 patients, 213 (Group 1) were arthroscopically diagnosed with Palmer 1B lesions: 136 Atzei Class 1, 75 Class 2, and 2 Class 3. The remaining 101 patients (Group 2) had other wrist conditions. All Group 1 patients recorded TTL scores >5, with mean values increasing proportionally to lesion severity (Class 1: 6.52; Class 2: 8.15; Class 3: 9.0). In contrast, all but three Group 2 patients recorded scores <3. Diagnostic analysis revealed 100% sensitivity, 97.03% specificity, 98.6% positive predictive value, and 100% negative predictive value. ROC analysis yielded an AUC of 0.999, with the optimal threshold identified as VAS >5.

Conclusions: The TTL test is a simple, reproducible, and highly accurate clinical tool for detecting peripheral TFCC lesions (Palmer 1B). A TTL score >5 shows a strong correlation with arthroscopic findings and effectively distinguishes TFCC-related pain from other causes of ulnar-sided wrist discomfort. Incorporating the TTL test into routine clinical assessment may improve early diagnosis, facilitate timely intervention, and help restore the biomechanical balance essential to stable and functional wrist motion.

A-0891 A FIVE-YEAR RETROSPECTIVE ANALYSIS OF TWO OPERATIVE TECHNIQUES FOR THUMB CMC OSTEOARTHRITIS

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Introduction: Thumb carpometacarpal osteoarthritis is a frequent cause of pain, loss of strength, and functional limitation in adults. When conservative treatment fails, surgery is considered. Two commonly used operative techniques are ligament reconstruction with tendon interposition and prosthetic arthroplasty. Although both techniques are well established, comparative evidence regarding functional outcomes, rehabilitation requirements, radiographic severity, strength recovery, and patient satisfaction is still limited. A better understanding of the performance of each technique may support more individualized treatment decisions.

Objective: To compare the clinical and functional outcomes of ligament reconstruction with tendon interposition and prosthetic arthroplasty in the surgical treatment of thumb carpometacarpal osteoarthritis. The study evaluated radiographic severity, rehabilitation needs, grip and pinch strength, opposition, and patient satisfaction based on reported improvement in pain and function.

Materials and Methods: A retrospective review was conducted including all patients surgically treated for thumb carpometacarpal osteoarthritis between 2019 and 2024 in a tertiary center. A total of 120 patients were included. Surgical procedures were categorized into ligament reconstruction with tendon interposition (41 cases) and prosthetic arthroplasty. The following variables were collected: age, sex, laterality, Eaton classification, duration of work leave, need for postoperative rehabilitation, grip strength, pinch strength, opposition, abduction, adduction, patient satisfaction

based on perceived improvement in pain and function, and follow up duration. Quantitative variables were analyzed descriptively and compared between the two groups.

Results: Of the 120 procedures, 41 were ligament reconstructions and the remainder prosthetic arthroplasties. Age distribution was similar in both groups. Radiographic severity showed comparable patterns between techniques. In the prosthetic arthroplasty group, there were 11 cases in Eaton stage II, 20 in stage III, and 2 in stage IV. In the ligament reconstruction group, 5 cases were stage II, 15 stage III, and 2 stage IV. The need for rehabilitation differed substantially: 14.8 percent of patients who underwent prosthetic arthroplasty required postoperative rehabilitation, compared with 92.8 percent of those treated with ligament reconstruction. Mean grip strength was 20.1 kilograms in the prosthetic arthroplasty group and 20.4 kilograms in the ligament reconstruction group. Mean pinch strength was 7.7 and 7.5 kilograms respectively. Opposition scores demonstrated a slight functional advantage in the prosthetic arthroplasty group, with a mean of 8.24 compared to 7.58 in the ligament reconstruction group. Patient satisfaction, assessed through perceived improvement in pain and function, was higher in the prosthetic arthroplasty group, with a mean value of 1.02 compared with 0.74 in the ligament reconstruction group. Follow up duration reflected the 2019 to 2024 study period, with the ligament reconstruction group showing a longer mean follow up.

Conclusion: Both techniques are valid options for the surgical treatment of thumb carpometacarpal osteoarthritis. Prosthetic arthroplasty demonstrated higher patient satisfaction, lower rehabilitation requirements, and a slight advantage in opposition. Ligament reconstruction achieved similar strength outcomes but required longer follow up and more intensive rehabilitation. Overall, prosthetic arthroplasty may be considered a more favorable therapeutic option, particularly for patients in whom functional recovery and satisfaction are prioritized.

A-0892 CLINICAL OUTCOMES OF ANTEROGRADE INTRAMEDULLARY HEADLESS COMPRESSION SCREW FIXATION IN METACARPAL FRACTURES

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Introduction: Extra-articular metacarpal shaft fractures that are displaced or unstable often require surgical fixation. Traditional techniques such as percutaneous wire fixation or plate fixation may lead to pin tract infection, tendon adhesions, stiffness, and other soft-tissue problems. Antegrade intramedullary headless compression screw fixation avoids violation of the distal joint surface and extensor mechanism and may therefore reduce these complications. This study evaluates the clinical and radiographic outcomes of this technique.

Aim: To assess fracture healing, digital range of motion, grip strength, patient-reported outcomes, and complications after antegrade intramedullary headless compression screw fixation of metacarpal shaft fractures.

Materials and Methods: A two-center prospective observational study was performed between September 2022 and August 2024. Consecutive patients with extra-articular metacarpal shaft fractures treated using an antegrade intramedullary headless compression screw were included. Patients were excluded if they had previous injury to the same hand, associated tendon, nerve, or blood vessel injury, crush trauma, or any fracture extension into a joint. Those with at least one year of follow-up were invited for evaluation.

Clinical information included patient demographics, fracture characteristics, implant details, time to radiographic healing, and complications. Follow-up consisted of measurement of digital range of motion using the Total Active Motion method, grip strength testing with a dynamometer, and patient-reported outcomes including an upper limb disability score and visual pain scores. A loss of thirty degrees of Total Active Motion or six and a half kilograms of grip strength compared with the uninjured hand was considered clinically meaningful. Radiographs were reviewed by a musculoskeletal radiologist. Results: Thirty-four fractures in thirty-one patients were treated. Radiographic healing occurred in thirty fractures, with a mean healing time of forty-three days. Seventeen patients completed long-term follow-up. Digital range of motion in the operated finger did not differ significantly from the uninjured side, and equivalence testing showed no meaningful loss ($p = 0.38$). The study had approximately eighty percent power to detect a thirty degree difference in motion. Eighty-eight percent of patients achieved good or excellent motion, and only one patient showed a clinically meaningful reduction. Grip strength reached ninety-one percent of the uninjured hand, with no significant or clinically important difference ($p = 0.24$) and approximately eighty percent power to detect a reduction of six and a half kilograms. One intraoperative complication occurred without clinical consequences. No infections, tendon adhesions, extensor lag, hardware irritation, or growth plate injuries were observed.

Conclusions: Antegrade intramedullary headless compression screw fixation provides reliable fracture healing and excellent restoration of motion and strength in metacarpal shaft fractures. By avoiding injury to the distal joint surface and extensor mechanism, this technique minimizes soft-tissue morbidity and represents a safe and effective treatment option for selected fracture patterns.

A-0894 TWO-COLUMN MIDCARPAL ARTHRODESIS WITH HEADLESS COMPRESSION SCREWS: A MULTICENTER SERIES OF 128 PATIENTS

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Introduction: Two-column midcarpal arthrodesis (2CMA) following scaphoidectomy is a well-established surgical option for advanced wrist arthritis, particularly in scapholunate advanced collapse (SLAC) and scaphoid nonunion advanced collapse (SNAC) stage III wrists. By selectively fusing only the ulnar and central midcarpal column, 2CMA aims to restore a functional balance between stability and residual mobility, reducing pain while preserving wrist motion. Headless compression screws (HCS) have increasingly been used to enhance fixation and bone consolidation, but long-term data across large patient cohorts remain limited.

Aim: To evaluate the long-term clinical and radiographic outcomes of two-column midcarpal arthrodesis using headless compression screws, with particular focus on pain relief, functional recovery, fusion rates, and preservation of biomechanical balance in wrist motion.

Material & Methods: A retrospective study was performed on 128 patients who underwent 2CMA using HCS between 2001 and 2022 at two institutions. All patients underwent preoperative wrist arthroscopy to confirm radiolunate cartilage integrity and suitability for motion-preserving arthrodesis. Clinical outcomes were assessed using the Modified Mayo Wrist Score (MMWS), Disability of the Arm, Shoulder, and Hand (DASH), Patient-Reported Wrist Evaluation (PRWE), and Visual Analogue Scale (VAS) for pain at rest and under stress. Wrist range of motion and grip strength were recorded, and radiographs were used to assess bone fusion. Statistical analyses compared pre- and postoperative results.

Results: At a mean 45-month follow-up, patients showed significant improvement in all clinical parameters. VAS scores improved from 2.0 to 0.6 at rest and 8.0 to 2.0 under stress ($p < 0.001$). Functional scores improved markedly: MMWS from 27 to 69, DASH from 73 to 37, and PRWE from 79 to 26 (all $p < 0.001$). Wrist range of motion increased from 61° to 81° ($p < 0.001$), and grip strength improved from 19 to 28 kg (from 58% to 83% of the contralateral side, $p < 0.05$). Radiographic fusion was achieved in 99% of cases. Complications occurred in 4% of patients, with only two requiring conversion to total wrist fusion due to progressive radiocarpal arthropathy.

Conclusions: Two-column midcarpal arthrodesis using headless compression screws is a reliable and durable reconstructive technique for advanced wrist arthritis. It provides substantial pain reduction, significant functional improvement, excellent fusion rates, and preserves a balanced compromise between stability and motion, unlike more extensive fusion procedures. The low complication rate and high success rate support 2CMA as an effective alternative to four-corner arthrodesis. Comparative prospective studies may further clarify its role in long-term wrist joint preservation and biomechanical balance.

A-0895 BILATERAL CHRONIC SCAPHOLUNATE DISSOCIATION, TWO TECHNIQUES

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Introduction: Scapholunate (SL) dissociation is a common cause of wrist pain but often missed on initial evaluation, causing a delay in the diagnosis. Treatment can be challenging due to several factors such as malalignment of the carpus, limited surgical options and risk of recurrent instability. We are presenting a case of bilateral rizartrrosis and chronic scapholunate dissociation treated surgically using two different techniques.

Case presentation: A 65-year-old female with chronic scapholunate dissociation and rizartrrosis treated firstly with trapeziometacarpal joint arthroplasty and then with scapholunate reconstruction with internal brace augmentation using ECRB. Two years later, the patient suffered from chronic scapholunate dissociation and rizartrrosis and was treated firstly with trapeziometacarpal joint arthroplasty and then with arthroscopic dorsal capsulodesis. The patient had better short-term outcomes on the right wrist, treated arthroscopically, but good long-term results on the left wrist.

Conclusions: Chronic SL dissociations remain a problem in terms of management and surgical options, with ongoing debate regarding the optimal surgical technique.

A-0896 FACTORS INFLUENCING ATTENDANCE AT POST-OPERATIVE REHABILITATION FOLLOWING HAND TRAUMA: A THREE-YEAR RETROSPECTIVE COHORT STUDY

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Introduction: Effective rehabilitation is essential for restoring function following hand trauma surgery, however non-attendance at follow-up appointments compromises recovery and contributes to avoidable cost and disability. Understanding the demographic and socioeconomic factors that drive non-attendance is critical to improving equity and outcomes in surgical aftercare. This study aimed to identify predictors of non-attendance following hand trauma surgery and help inform targeted strategies to enhance patient engagement and postoperative recovery.

Material & Methods: A single-centre retrospective cohort study was undertaken of patients undergoing hand trauma

surgery at a London hand trauma unit between January 2020 and April 2023. Demographic and clinical data was extracted from electronic hospital records including age, sex, occupation, residential status, first language, smoking status, follow-up type, and procedure type. The primary outcome measure was attendance at initial and subsequent postoperative follow-up appointments. Multivariate logistic regression analysis identified independent factors predicting non-attendance. Results: 303 patients were identified, with an overall non-attendance rate of 4% for initial and 30% for subsequent appointments. Younger patients were significantly less likely to attend, with each decade increase in age raising attendance odds by 48% (OR = 1.042, 95% CI 1.019–1.065, $p = 0.000$). Lower attendance was also associated with manual or operational occupations (OR = 0.198, 95% CI 0.051–0.774, $p = 0.02$), economic inactivity (OR = 0.322, 95% CI 0.110–0.944, $p = 0.039$), and smoking (OR = 0.413, 95% CI 0.232–0.736, $p = 0.003$). Dressings-only appointments were six times more likely to be attended (OR = 6.054, 95% CI 1.092–33.570, $p = 0.039$). No significant associations were found between attendance and sex, first language or procedure type.

Conclusions: Non-attendance at follow-up after hand trauma surgery disproportionately affects younger patients, as well as smokers and individuals working in manual or operational roles or who are economically inactive. The latter groups are more likely to experience socioeconomic disadvantage, reflecting underlying social and health inequalities that may influence engagement with postoperative care. This highlights the need for targeted, patient-centred interventions to help improve attendance, reduce inequality, and enhance long-term functional outcomes for hand trauma patients.

A-0897 THE TREATMENT OF BONY Mallet Finger Aimed at Early Return to Sport or Manual Work

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Introduction: The bony mallet finger is a tear fracture of the extensor tendon, resulting in a flexion deformity of the finger, which affects both the function of the finger. The classical Ishiguro's method consists of closed reduction and K-wire DIP joint blocking. This procedure is an excellent minimally invasive surgery, but it has some inconveniences in ADL, such as the possibility of infection and activity limit due to the wire protruding above the skin for several weeks. It imposes significant restrictions, especially on athletes and patients who do heavy labor that gets their hands dirty.

Aim: We treat patients with subcutaneously buried DIP joint temporary fixation pins (D pins) + micro screws (MS) fixation, aiming for early return to sports and work, and we investigated the postoperative clinical outcomes.

Material & Methods: There were 16 cases (12 males, 4 females, average age 37.7 years). The cause of injury was sports in 7 cases and work-related trauma in 9 cases.

An extension block pin (E pin) was inserted into the middle phalanx according to the Ishiguro method, the bone fragment was percutaneously repositioned, and the DIP joint was provisionally fixed with a D pin from the tip of the finger. A small skin incision of about 2 mm was made from the dorsal midline with a sharp blade knife, the bone fragment was internally fixed with MS, and the incision was fixed with tape. The E pin was removed before returning to sports or current work.

Results: The follow-up period was 10 weeks, and all cases achieved bone union. The return to sports was 2 weeks, and the return to current work was 1 week. The E pin was removed at an average of 1.5 weeks, and the D pin was removed at an average of about 4.4 weeks. Three cases had a joint surface step of 0.5 mm or more after surgery. The range of motion of the DIP joint at the final joint was an average of -7.8° in extension and 50.6° in flexion, and Crawford's evaluation method was excellent in 8 cases, good in 4 cases, fair in 2 cases. There were no complications such as pin breakage.

Conclusions: This method may allow for early return to sports and manual labor safely.

A-0898 SURAL NERVE GRAFTING FOR MIXED CLAW HAND IN VOLKMANN CONTRACTURE

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Introduction: Volkmann’s ischemic contracture is a late consequence of acute compartment syndrome of the forearm that causes flexor muscle contractures and neurological dysfunction. Combined injury to the median and ulnar nerves leads to the development of a mixed claw hand with a significant impact on overall hand function. In chronic cases, traditional techniques, such as tendon transfers or nerve transfers in extensive gaps, may be insufficient due to the scar tissue and the distance of reinnervation. In these context, microsurgical reconstruction with autologous grafts is a viable alternative, allowing the restoration of axonal continuity and promoting motor and sensory reinnervation.

Aim: Effectiveness of autologous sural nerve graft in chronic median and ulnar nerve lesion.

Material & Methods: Clinical case description.

Results: A 37-year-old male with a second-degree burn on his right forearm and hand, presenting with exuberant edema and diffuse hypoesthesia of the hand, with three months of evolution. Physical examination revealed flexed wrist, cubital claw, and marked atrophy of the thenar and hypothenar regions. Magnetic resonance imaging (MRI) showed significant edema of the flexor tendons in the volar region, maintaining their continuity. Electromyography revealed severe axonal injury of the median and ulnar nerves in the area corresponding to the edema and scar.

A mixed claw hand was diagnosed due to a combined injury of the median and ulnar nerves secondary to the burn, and reconstruction with an autologous sural nerve graft was proposed. Four months after surgery, and with intensive physical therapy, sensory improvement (S2) and the onset of digital mobility (M1) were observed. At six months there was progression to S3 sensitivity and M2 strength, with electromyography compatible with significant axonal regeneration.

Conclusions: Prolonged ischemia of the forearm compartments can cause combined injury to the median and ulnar nerves, resulting in a mixed claw hand with severe dysfunction and marked deterioration in quality of life. In the presence of extensive nerve damage, autologous sural nerve grafting is an effective solution, allowing recovery of neural conduction and rebalancing of the extrinsic and intrinsic function of the hand. The case presented demonstrates that, even in an adverse scar tissue, nerve reconstruction enables clinically relevant sensory and motor regeneration, contributing to the restoration of the overall biomechanical balance of the hand.

A-0899 DIGITAL GLOMUS TUMOURS: A RETROSPECTIVE REVIEW OF 64 CASES OVER 28 YEARS IN TWO REGIONAL PLASTIC SURGERY DEPARTMENTS

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Introduction: Digital glomus tumours are rare benign neoplasms that cause disproportionate pain and functional limitation despite their small size. Diagnosis may be delayed and is often supported by one or more imaging modalities, although practice varies and the necessity of imaging in clinically classical cases is debated. A subset of patients with neurofibromatosis type 1 may present with painful digital lesions, and distinguishing glomus tumours from other tumour types in this group is clinically important.

Aim: To describe the demographic profile, imaging utilisation and operative outcomes of digital glomus tumours, and to identify the proportion associated with neurofibromatosis type 1.

Material & Methods: A retrospective review was conducted of all histologically confirmed digital glomus tumours excised between 1997 and 2025 within two regional plastic surgery departments. Data collected included age at diagnosis, sex, imaging modality, diagnosis of neurofibromatosis type 1, completeness of excision and recurrence.

Results: Sixty-four patients with digital glomus tumours were identified. The mean age at diagnosis was 47 years (range 10 to 74), with the majority occurring in working age adults. 42 patients were female giving a male to female ratio of 4 to 7. Seventeen patients underwent magnetic resonance imaging prior to surgery. Twelve patients (underwent magnetic resonance imaging together with at least one additional imaging modality (eight ultrasound, one computed tomography, three plain x-ray). One patient had magnetic resonance imaging, ultrasound and plain x-ray. A further four patients had ultrasound alone, giving a total of 46 radiological investigations in this cohort. Eight patients had a diagnosis of neurofibromatosis type 1. Complete excision was confirmed in only seventeen cases. Among the forty-seven cases without confirmed complete excision, five patients developed recurrence requiring further treatment. Symptomatic improvement was noted following excision in all patients with available follow up.

Conclusions: Digital glomus tumours in this cohort predominantly affected adults of working age and caused significant symptoms prompting referral. Imaging was frequently utilised, although practice varied. In patients with neurofibromatosis type 1, glomus tumours should be considered within the differential diagnosis of painful digital lesions. Surgical excision provided reliable resolution of symptoms, with recurrence occurring in five percent of cases and limited to those without confirmed complete excision. To the authors' knowledge, this represents one of the largest case series of digital glomus tumours reported in the hand surgery literature.

A-0901 TRIGGER WRIST – A DISTURBANCE OF THE DELICATE BALANCE OF TENDONS AND PULLEYS. A SYSTEMATIC REVIEW AND PROPOSED CLASSIFICATION

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Introduction: The tendons of the wrist and fingers run smoothly through their sheaths, held perfectly in place by the pulley systems, including the wrist retinaculae. This balance can be disrupted causing significant functional impairment. Trigger wrist is defined as triggering at the level of the flexor or extensor retinaculum of the wrist. It is caused by various lesions and leads to a triggering sensation on wrist or finger movement depending on the tendon involved.

Aim: This study aims to describe the definition, diagnosis and management of trigger wrist. We will summarise the evidence for this rare condition by means of a formal systematic review and propose a new classification based on the site of pathology.

Material & Methods: A systematic review was performed in accordance with PRISMA guidelines. Aetiology, symptoms, investigations, treatment and outcomes were recorded and analysed.

Studies were selected and data extracted by three reviewers. Three reviewers independently selected articles and extracted data and a fourth (the senior author) checked decisions and resolved disagreements. Data was recorded in an excel spreadsheet.

Results: A total of 89 cases were identified from 65 publications (55 case-reports, 3 case-series and 7 review articles).

Tendons identified as causing trigger wrist included finger flexors (79 – FDS, FDP and FPL); Lumbricals (4), thumb extensors (2 – APL); and wrist extensors (4 – ECRL and ECRB). Wrist flexors were not identified as a cause of trigger wrist, presumably because they do not pass under the flexor retinaculum. 62 cases had associated carpal tunnel syndrome (70% of all cases, 81% of cases involving finger flexors). A variety of benign lesions were causative with no reported cases of malignancy.

Plain radiograph, ultrasound (standard and dynamic), computed tomography and magnetic resonance imaging were utilised for diagnosis. MRI and diagnostic US were particularly valuable.

All cases were managed surgically, by either carpal tunnel release, tumour excision, tenolysis, or a combination of these. One patient had partial recurrence due to a rheumatoid nodule. There was complete resolution of symptoms in all other cases. We propose a classification based on pathology site which helps direct treatment. Type 1 involves finger flexors triggering within the carpal tunnel. Type 2a involves finger extensors triggering at the extensor retinaculum. Type 2b involves wrist extensors triggering at the extensor retinaculum.

Conclusions: Trigger wrist is a rare condition causing mechanical "triggering", normally accompanied by pain, at the wrist. It can be caused by entrapment of the finger flexors as they pass through the carpal tunnel (a proximal form of trigger finger) or more rarely by entrapment of the wrist or finger extensors at the extensor retinaculum. When the finger flexors are involved the condition is invariably accompanied by CTS. Diagnosis can be hampered by unfamiliarity with the condition and often requires advanced imaging such as dynamic ultrasonography and magnetic resonance imaging. Treatment is primarily surgical, normally consisting of carpal tunnel release (analogous to A1 pulley release for trigger finger) and excision of any associated space occupying lesions.

A-0902 WHAT PREDICTS TRIGGER FINGER AFTER MEDIAN NERVE RELEASE? THE FOOL THE TRIGGER STUDY

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Introduction: Median nerve release in the surgical treatment of carpal tunnel syndrome (CTS) is associated with an increased incidence of trigger finger, estimated at 7–13% in the first postoperative months. The etiology remains unclear, although it is believed that biomechanical changes in the flexors and some systemic factors may contribute to its development.

Aim: Evaluate the incidence of trigger finger after open median nerve release and identify factors that may influence the development of stenosing tenosynovitis in the postoperative period.

Material & Methods: This is a retrospective study that includes the evaluation of 100 patients who underwent median nerve release surgery in 2024. Patients with a clinical and electrophysiological diagnosis of CTS who underwent open median nerve release were included. Patients with a preoperative diagnosis of trigger finger, rheumatic disease, or a history of hand surgery were excluded.

The variables studied were collected after one year of follow-up, regarding gender, age, handedness, previous comorbidities, and duration of symptoms until surgery. The specific digit involved and the time elapsed until the development of trigger finger after decompression were analyzed, as well as its clinical severity, according to the Green classification.

Results: One hundred patients who underwent open median nerve release were analyzed, most of whom were female (73.5%), with a mean age of 58.7 years. The incidence of trigger finger was 21.7%. Female gender was significantly associated with this complication ($p=0.048$), while age, handedness, and duration of preoperative symptoms showed no statistical relation. Diabetes mellitus emerged as a relevant risk factor ($p\approx 0.0017$). The third postoperative month was the most critical period, accounting for 44% of cases. The thumb (D1) was the most frequently affected finger (39%), and the severity was mostly mild to moderate.

Conclusions: The results of this study corroborate the increased incidence of trigger finger after median nerve release in surgical resolution of carpal tunnel syndrome. The most affected finger appears to be the thumb, occurring mainly in the first few months after surgery. Female gender and diabetes were relevant risk factors for the development of stenosing

tenosynovitis, which underscores the importance of monitoring risk groups in identifying this clinical entity and thus preserving the functional balance of the hand.

A-0903 CLINICAL IMPACT OF SYSTEMIC COMORBIDITIES AND REPETITIVE HAND USE ON OUTCOMES AFTER REVISION CARPAL TUNNEL RELEASE: A RETROSPECTIVE COHORT STUDY

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Introduction: Optimal hand function relies on the balance between skeletal stability, joint congruency, coordinated intrinsic and extrinsic muscle function, and intact neural and vascular pathways. Carpal tunnel syndrome (CTS) disrupts this balance through chronic median nerve compression, and recurrent symptoms following primary release present an even greater challenge, often reflecting a multifactorial interplay of mechanical, biological, and systemic factors. Systemic comorbidities such as diabetes mellitus, thyroid dysfunction, rheumatoid arthritis, and chronic kidney or liver disease are established contributors to primary CTS; however, their influence on postoperative recovery after revision CTS surgery remains insufficiently evaluated. Additionally, repetitive occupational hand use may alter tendon–nerve biomechanics and further interfere with functional restoration, yet its role in postoperative outcomes of revision CTS surgery is not well understood.

Aim: To quantify the influence of systemic comorbidities and repetitive occupational hand use on clinical outcomes following revision open carpal tunnel release.

Material & Methods: A total of 58 revision CTS procedures were performed between 2018 and 2024 at our department. Twenty-seven patients were available for follow-up assessment in November 2025. Collected variables included age, sex, BMI, smoking, alcohol use, systemic comorbidities (diabetes mellitus, rheumatoid arthritis, thyroid dysfunction, chronic kidney or liver disease), and repetitive occupational hand exposure. Baseline electrophysiological severity was categorized as mild, moderate, severe, or extreme. Outcomes were assessed ≥ 6 months postoperatively and included pain reduction measured by VAS (0–10), DASH score, grip strength, and sensory recovery classified as complete, partial, or absent. Statistical analysis included the Mann–Whitney U test for continuous versus categorical variables, Spearman rank correlation for non-parametric associations, and the χ^2 test for categorical comparisons.

Results: Systemic comorbidities were present in 44% of patients, and 77% reported repetitive occupational hand use. Based on the Mann–Whitney U test, patients with absent sensory recovery were significantly older compared with those demonstrating partial recovery ($p < 0.01$). No statistically significant age difference was observed between the complete and partial recovery groups. Higher BMI was associated with improved sensory outcomes, with a significant difference identified between the complete and absent recovery groups ($p < 0.05$), although this trend did not translate into a clinically meaningful effect size. No additional demographic, occupational, or clinical variables demonstrated statistically significant associations with sensory recovery. No statistically significant associations were found between systemic comorbidities and postoperative pain, DASH score improvement, or grip strength recovery.

Conclusions: Systemic comorbidities and repetitive occupational hand use were prevalent among patients presenting for revision CTS surgery, yet only age and BMI were associated with differences in sensory outcomes. These statistical associations may lack clinical relevance, and larger prospective studies are necessary to define risk profiles and inform patient counseling and rehabilitation strategies.

A-0904 GRIP STRENGTH, FUNCTIONAL STATUS AND PAIN IN UPPER-STRING MUSICIANS: A COMPARATIVE STUDY

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Introduction: Grip strength is commonly reported in the literature as a valid and reliable marker of upper limb function and overall physical health. Musicians, as an occupational group, engage in highly repetitive and demanding upper-extremity activities. This is particularly true for upper-string players, whose performance requires sustained and asymmetric use of the upper limb with high demands on fine-motor control, making upper-limb function a central component of their performance.

Aim: This study aims to compare grip strength, strength asymmetry, upper-limb functional status and region-specific pain between upper-string musicians and non-musician controls.

Material & Methods: This study included 38 professional upper string musicians (mean age 32.60 ± 12.91 years; mean BMI 23.96 ± 4.13 kg/m²; 27 female and 11 male; 24 violin and 14 viola players; mean playing experience 22.1 ± 13.4 years) and 38 non-musician controls (mean age 33.60 ± 11.91 years; mean BMI 24 ± 3.87 kg/m²; 27 female and 11 male). All participants were right-hand dominant. Grip strength was assessed using a hydraulic hand dynamometer; upper-limb function was evaluated with the QuickDASH questionnaire; and musculoskeletal pain was assessed using the Nordic Musculoskeletal Questionnaire. Normality was tested with the Shapiro-Wilk test. Depending on distributional characteristics, independent samples t-tests, paired samples t-tests, Mann-Whitney U tests and chi-square tests were performed. Statistical significance was set at $p < 0.05$.

Results: Grip strength did not differ significantly between musicians and non-musicians for either the right hand ($p = 0.291$, $t = 1.064$) or the left hand ($p = 0.238$, $t = 1.190$), although mean grip strength was higher in the non-musician group for both sides. In the musician group, right grip strength was significantly higher than left ($p = 0.001$, $t = 3.443$). Similarly, in non-musicians, right-hand grip strength was significantly higher than left ($p < 0.001$, $t = 5.019$). Grip strength asymmetry did not differ between musicians and non-musicians ($p = 0.900$, $z = -0.126$). QuickDASH scores were significantly higher in musicians than non-musicians ($p = 0.031$, $t = -2.195$). A significantly higher proportion of musicians reported shoulder pain compared with non-musicians ($\chi^2 = 8.92$, $p = 0.0028$). However, differences in elbow pain ($\chi^2 = 2.88$, $p = 0.089$) and hand/wrist pain ($\chi^2 = 2.77$, $p = 0.096$) were not statistically significant.

Conclusions: Although musicians use their upper extremities more intensively than non-musicians, their grip strength was not higher and even showed slightly lower mean values. This may be due to the demands of musical performance, which rely more on fine motor control, precision and task-specific muscle activation than on strength. Despite comparable strength and asymmetry, musicians reported greater upper-limb symptoms and functional difficulty and a higher prevalence of shoulder pain. These findings highlight that intensive use of the upper limb does not necessarily translate into greater global strength, and the functional demands of instrument playing cannot be adequately captured by grip strength alone.

A-0905 INTRAARTICULAR CORONAL SHEAR FRACTURE OF THE METACARPAL HEAD

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Introduction: Metacarpal head fractures are only 4-5% of all metacarpal fractures, and closed reduction is usually unsuccessful. Displaced coronal shear fractures are rare and need surgical interventions. This retrospective study describes

our case series of metacarpal head fractures including their characteristics, postoperative functional and radiographic outcomes.

Materials and Methods: Seven hand in 7 patients (male/female=6/1) whose mean age was 25.0 years (range 15-56 years) were included in this study. Affected side and finger, injured mechanism, fracture type, surgical approach and instruments, postoperative range of motion (ROM) and complications were investigated.

Results: Six patients (85.7%) had injured their dominant right hand, and ring finger was most affected (thumb/index/middle/ring/little=0/1/1/3/2). Five hands (71.4%) were injured by sports activity. four fractures (57.1%) were fragmented volarly and the remaining 3 fractures dorsally. Dorsal approach was provided in all 7 cases, and fracture was fixed definitively using headless compression screw (HCS) in 6 cases (85.7%). Post operative flexion of MP joint was regained over 80 degrees with no extension lag, and fracture union was achieved radiographically in all cases. Also, no post operative complication was experienced and no radiographic degenerative change at the affected MP joint was shown in all cases during follow-up.

Conclusion: Open accurate reduction via dorsal approach and stable internal fixation using HCS had favorable functional results in metacarpal head fractures.

A-0907 BODY INTEGRITY IDENTITY DISORDER AND HAND SURGERY - A RARE DISABILITY AND A CHALLENGING CASE Max Meyer-Marcotty, Maria Alperi

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Introduction: BIID is a rare psychiatric disorder where people feel the urge to amputate functioning extremities up to the point that they try to amputate an extremity themselves.

There is no successful psychiatric conventional therapy and some patients report about a relief after having the limb amputated. So, should a Handsurgeon follow the patients' wish to amputate a healthy functioning limb?

Aim: We would like to present a case of a patient with BIID who was admitted to our emergency room after having tried to amputate some of her fingers. We also want to discuss this rare psychiatric disorder and the Handsurgeons' perspective towards amputation of a healthy limb in this context and in the context of the published literature. How do we position ourselves on the basis of our ethics *primum nil nocere* in such an extreme situation?

Material & Methods: Case report

Results: **Conclusions:** BIID is rare but ethically challenging. A thorough psychiatric work up and a multidisciplinary approach including the Handsurgeon, Psychiatrist and an Ethic Committee has to be involved in the treatment of those patients to find the best treatment.

A-0909 ISOELASTIC RESURFACING PROSTHESIS (PROSTHELAST®) FOR COMMUNUTED DISTAL RADIUS FRACTURES IN ELDERLY PATIENTS: MEDIUM-TERM OUTCOMES WITH A MEAN FOLLOW-UP OF 3.7 YEARS

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Introduction: Unicompartmental resurfacing prostheses have emerged as a potential treatment option for comminuted intra-articular distal radius fractures in elderly patients with osteoporotic bone quality. Despite promising early reports, data on their long-term outcomes remain limited. The aim of this study was to evaluate the clinical and radiological

outcomes following implantation of a unicompartamental resurfacing prosthesis in elderly patients with distal radius fractures, with a minimum follow-up of two years.

Patients and Methods: A total of 23 female patients (mean age 78 years; range 63–91) with AO type C distal radius fractures were treated with the Prosthelast® isoelastic resurfacing prosthesis. None of the fractures were open. Clinical outcomes were assessed using the Visual Analogue Scale (VAS) for pain, wrist range of motion, grip strength, and standardized functional scores (QuickDASH and PRWE). Radiological evaluation included assessment of implant positioning, bone remodeling, and potential complications.

The mean follow-up duration was 3.7 years (range: 2.0–6.9 years). All patients reported satisfaction with their decision to undergo prosthesis implantation and did not feel functionally limited in daily life, despite reduced range of motion. QuickDASH and PRWE scores indicated a certain level of functional limitation; however, a relevant portion of this impairment could be attributed to comorbidities, such as stenosing tenosynovitis, carpal tunnel syndrome and degenerative changes unrelated to the prosthesis (e.g., rhizarthrosis).

To date, no patient has required revision surgery. Complications directly related to the prosthesis were minor and included: a pulling sensation in the distal forearm due to the prominent volar aspect of the radial component, one asymptomatic perforation of the radial head, impingement caused by osteophyte formation at the scaphoid, and bone remodeling around the prosthesis, which was observed in all patients except one.

At a mean follow-up of 3.7 years, the isoelastic resurfacing prosthesis appears to be a viable treatment option for complex intra-articular distal radius fractures in elderly osteoporotic patients. These findings support the potential role of this technique, though further long-term studies are warranted to confirm durability and functional outcomes.

A-0911 FUNCTIONAL RESULTS OF ARTHROSCOPIC CAPSULODESIS: RETURN TO SPORTS OR HEAVY MANUAL WORK

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Introduction and Aim: Treatment of chronic scapholunate ligament injuries is still a challenge and if left untreated may lead to SLAC wrist. Arthroscopic capsulodesis is a minimally invasive technique that can be used in dynamic and pre-dynamic injuries in order to relieve pain and avoid progression of arthritis. The advantage of arthroscopic techniques is to be minimally invasive, reducing stiffness and allowing a quick recovery. The aim of this study is to evaluate the results and the recovery of sports activity and /or heavy manual work in the treated patients.

Materials and Methods: Thirty two patients with dynamic or pre-dynamic SL injuries were included (EWAS grade 3 A, B, C); 23 males and 9 females, mean age 34.3 ± 9 yo (min 21 max 46). All patients had XRay and MRI scan pre-operatively and were treated with arthroscopic capsulodesis. Patients were reviewed with a mean FU of 24.1 ± 8.1 months (min 11; max 36 mesi). Patients were evaluated with DASH, Mayo Wrist Score, PRWE, Vas score, Grip and ROM compared to contralateral side. **Results:** All patients have regained sports activities and/or heavy manual work. One patient under heavy load still had pain (>50Kg). Mean post-operative DASH score was 4.9 ± 4.1 compared to mean pre-op 37.22 ± 8.66 ($p < 0.05$). Mean post-operative Mayo Wrist Score was 92.14 ± 9.51 compared to pre-op 55 ± 9.4 ($p < 0.05$). Mean post-operative PRWE was 9.4 ± 3.7 compared to mean pre-operative 56.75 ± 14.56 ($p < 0.05$). Mean VAS was 0.28 ± 0.48 compared to pre-operative 6.83 ± 2.99 ($p < 0.05$). Mean Grip was 35.71 ± 12.46 compared to contralateral of 34.29 ± 10.75 ($p > 0.05$). ROM comparable to contralateral in all cases

Discussion and Conclusions: Our results in a population of young and active patients show encouraging results that are similar to other arthroscopic treatments of dynamic and pre-dynamic scapho-lunate instability. With more than two

years of follow-up results are satisfactory regarding wrist function, recovery of sports, heavy activities and quality of life, without stiffness that has been described in open procedures.

A-0912 IMMEDIATE MOBILIZATION AFTER TRAPEZIOMETACARPAL ARTHROPLASTY USING THE MAIA DUAL-MOBILITY PROSTHESIS: RESULTS OF A PROSPECTIVE SERIES OF 24 PATIENTS

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Introduction: Postoperative immobilization for 1–2 weeks is commonly recommended after trapeziometacarpal (TMC) arthroplasty to reduce the risk of early dislocation and to promote implant integration. However, dual-mobility implants such as the Maia prosthesis may provide inherent stability that could allow safe early mobilization. The aim of this study was to evaluate the safety and early functional outcomes of immediate mobilization without splints/cast following TMC arthroplasty with the Maia dual-mobility implant.

Aim: To evaluate the safety and early functional outcomes of immediate mobilization after trapeziometacarpal arthroplasty using the Maia dual-mobility prosthesis.

Material & Methods: A prospective observational study was conducted including 24 consecutive patients undergoing trapeziometacarpal arthroplasty with the Maia prosthesis. Patients with STT joint involvement, additional hand injuries, or prior surgery on the operated hand/wrist were excluded. All patients followed a protocol of immediate mobilization without postoperative casting. Outcomes recorded included pain (VAS), function (PRWE), key pinch, tip pinch, grip strength, and Kapandji score. Assessments were performed preoperatively, at 1 and 2 weeks (VAS and Kapandji only), and at 6 and 12 weeks (all measures). Complications, including dislocation, implant instability, and infection, were documented.

Results: All 24 patients completed early follow-up. No dislocations or implant-related complications were observed in any patient. Early motion was well tolerated. At 1 and 2 weeks, VAS scores showed progressive improvement, and Kapandji scores demonstrated early functional recovery. At 6 and 12 weeks, data confirm continued improvements in pain, PRWE scores, pinch and grip strength, and thumb mobility (Kapandji). No cases of instability or dislocation, infection, complex regional pain syndrome, or need for reintervention were identified.

Conclusions: In this preliminary prospective series, immediate mobilization following TMC arthroplasty with the Maia dual-mobility prosthesis was safe, with no dislocations or early implant-related complications observed. Functional recovery during the first 12 weeks was satisfactory. These findings support the potential feasibility of avoiding rigid immobilization in this patient population. A randomized controlled trial comparing immobilization versus early mobilization is underway to confirm these results.

A-0914 RADIOLOGICAL VERIFIED STABILITY AFTER PERFORMING DIFFERENT SURGICAL PROCEDURES TO TREAT ARTHROSIS OF THE TRAPEZIOMETACARPAL JOINT – A BIOMECHANICAL STUDY

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Introduction: Arthrosis of the trapeziometacarpal joint is the most common arthrosis of the hand. 20-30% occurs bilaterally, more females than males are affected. Several surgical procedures to treat TMC arthrosis, all aiming to preserve the stability and functionality of the thumb carpometacarpal joint.

Aim: Aim of the study is to compare strength and primary stability in a biomechanical model after performing a modified Eppingplasty with biotenodesis screw or using a MiniTightRope

Material & Methods: A physiological key pinch was performed in 24 fresh-frozen below-elbow arms, the trapezial space high got documented by x-ray and a polyaxial sensor. Fixation in the testing frame was in neutral position, movements in the carpometacarpal joint were free. Instead of the Index, a polyaxial sensor was placed, target values were 12,5 - 25 Newton for a physiological key pinch. Defined muscles were charged, the muscles vectors were reconstructed in eyelets in the metacarpale (MC) II, os hamatum, os capitatum. X-rays were taken in anterior posterior view and 30° to define the trapezial high before, after trapectomy and after resections-arthroplasty. The Key Pinch were performed frequently, three times in a row, to the defined times, preoperative, after trapezectomy and after performing the defined surgical method. **Results:** The key pinch was reproducibly performed without significant differences. There was also no significant difference between anterior-posterior and 30° x-rays. There was a significant difference between the both surgical procedures, the MiniTightRope has a trapezial space high from 130 percent without a load, extensor load 83 percent and 47 percent of the original trapezial space high in performing a maximal key pinch. The intra-rater-reliability was 96% and the inter-rater-reliability was 97%. All values showed significant differences in the MiniTightRope.

The MiniTightRope had a higher primary stability in comparison to the modified Eppingplasty with biotenodesis screw in this study.

Conclusions: MiniTightRope® is a great tool to recreate the jointline between the base of metacarpale I and the base of metacarpale II and for revisions, especially in failed cases of resections-suspensions-arthroplasty. To recreate the jointline is important for physiological movement of the thumb. Patients may benefit from further biomechanical testing of different surgical methods. The goal is to be able to establish surgery specific early occupational therapy. The thumb joint prothesis should not be neglected as a treatment option, since the anatomical conditions can be sufficiently reconstructed and the market leading implant shows good medium term results.

A-0915 REINFORMENT OF VOLAR SL LIGAMENT LESION

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Introduction: Arthroscopy and new biomechanical studies have given due importance to the volar component of the scapholunate ligament (SL). Management of isolated volar SL lig injury is rarely documented. Volar ligament reinforcement of the SL ligament was proposed by Moran in 2012 at IWIW meeting using part of the LRL ligament.

Aim: We present our experience with the treatment of volar open reinforcement (capsulodesis) of this ligament.

Material & Methods: From 2013 to 2024, we treated 52 cases (30 males and 22 females) with volar (24 cases) and volar and dorsal SL ligament tears. Wrist pain was volar at rest and under tentative of shift test. All patients were assessed preoperatively and at follow-up by studying wrist motion, grip strength, pain grading and work status (Maio Wrist Score). DASH and PRWHE was also used for subjective evaluation. In all patients correct diagnosis were done by wrist arthroscopy. Open surgery consisted in a volar approach to the wrist in which the radial side of a ulnar based flap of LRL ligament was attached to the scaphoid by an anchor suture reinforcing the SL volar ligament tear.

Results: The average follow-up was 26 months. In all patients operated on for volar SL ligament tears, pain and strength, DASH, and PRWHE scores were significantly improved. Wrist motion did not changed significantly. All returned to work or sports

Conclusions: The volar component of the scapholunate ligament is an important ligament for SL stability. Its involvement can only be precisely confirmed by arthroscopic examination. Its reinforcement should be strongly considered in the treatment strategy of SL ligament injuries.

A-0916 AUTOLOGOUS COSTAL CARTILAGE INTERPOSITION FOR COMBINED STT AND CMC-1 OSTEOARTHRITIS

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Introduction: Combined scaphotrapeziotrapezoidal (STT) and first carpometacarpal (CMC-1) osteoarthritis represents a demanding clinical situation, as degeneration on two adjacent levels can cause severe pain and affects thumb motion, pinch strength, and radial column comfort. Standard options such as isolated trapeziectomy, implant arthroplasty, or partial fusions frequently fail to address both joints adequately. A biological interposition technique aiming to reduce pain while maintaining functional thumb mobility may therefore be beneficial.

Aim: To present early to mid-term clinical outcomes of a biological reconstruction combining trapeziectomy, resection of the proximal third of the trapezoid, and interposition of autologous costal cartilage in patients with combined STT and CMC-1 osteoarthritis.

Material & Methods: Patients with persistent pain and functional limitations due to combined STT and CMC-1 osteoarthritis were included. The surgical procedure consisted of complete trapeziectomy, resection of the proximal third of the trapezoid, and placement of structured autologous costal cartilage as a biological interpositional spacer.

The graft was shaped to allow smooth motion and stable soft-tissue support within the reconstructed radial column.

Clinical follow-up assessed pain (VAS), key and tip pinch strength, thumb range of motion, grip strength, and patient-reported function. Follow-up ranged from 6 to 30 months.

Results: Patients reported a marked reduction in pain compared with preoperative levels. In most cases, key pinch strength improved, and thumb mobility remained well preserved. No symptomatic instability or complications related to the cartilage graft were observed.

Patients described improved comfort and functional confidence in daily tasks requiring precision pinch and moderate load. No donor-site morbidity occurred.

Conclusions: Autologous costal cartilage interposition after trapeziectomy and partial trapezoid resection appears to be a promising biological option for the treatment of combined STT and CMC-1 osteoarthritis. The technique provides meaningful pain reduction, maintains thumb mobility, and supports functional pinch without the disadvantages associated with implants or fusion.

Early to mid-term results support this method as a viable reconstructive alternative in patients with limited conventional options. Longer follow-up and a higher number of patients will be required to reliably assess long-term functional durability.

A-0917 CORRECTIVE OSTEOTOMIES OF THE UPPER LIMB: FUNCTIONAL RESULTS FROM DISTAL HUMERUS TO PHALANGES

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Introduction and Aim: Malunions of fractures of the upper limb can cause deformity, pain, restriction of range of motion, reduction of strength and at later stages development of osteoarthritis. The indications to treatment are young and symptomatic patients but also older patients with an active life. The classical method of measurement of bone and joint axis of the different upper limb bones on X Rays are very useful, but also comparative X Rays, as well as CT scan which is mandatory in order to understand the tridimensional aspects of malunion. Custom made plate and engineer assisted osteotomy guide systems can be useful in selected cases in complex malunions. Aim of the study is evaluate the results of the treatment of malunions of the upper limb

Materials and Methods

Forty three malunions of the upper limb were treated: 6 distal humerus, 19 radius, 1 forearm, 9 ulna, 2 metacarpals, 6 phalanges. Mean age 38 (12- 70 yo), 10 females and 33 males. Mean pre-operative DASH was 43.15, mean VAS was 7.3.07, mean Mayo 46.5.11, mean PRWE 57.7.19, mean Grip 15.7.3Kg. Closing wedge osteotomy was used for distal humerus, shorteninf of ulna, open wedge for the rest of the patients, in two cases bone graft was used. The majority of patients were treated with plate and screw fixation, one kid was treated with K wires and external fixation was used in distal phalangeal correction. In one case of forearm complex malunion engineer assisted guide system was used. Patients were reviewed with a mean follow up of 18 months (6 – 68 months) with X Rays.

Results: all patients obtained an excellent score with the Mayo wrist score or Mayo Elbow score with an excellent recovery of function at Follow-up. All malunion united. One case of distal radius had a partial loss of radiographic correction at FU and one elbow had a residual stiffness of 20° in extension (already present in the pre-op). Mean scores improved post-operatively in a statistically significant way: mean DASH was 7.8.11 ($p<0.01$), mean PRWE was 6.6.2 ($p<0.01$), VAS 0.5.0.8 ($p<0.01$), mean Grip 25.5.1 ($p<0.05$)

Discussion and Conclusions: corrective osteotomies allow optimal correction of post-traumatic upper limb deformities with improvement of function. The preoperative planning is essential with X rays and CT scans. Custom made systems are useful in selected cases. Modern internal fixation systems allow an optimal correction and stabilization of the fragments. Osteotomies are indicated in young patients with malunions of the upper limb bones but also in older symptomatic, active and independent patients.

A-0918 A MULTICENTRE PILOT FEASIBILITY RANDOMISED CONTROLLED TRIAL OF CONSERVATIVE MANAGEMENT STRATEGIES FOR THUMB CARPOMETACARPAL OSTEOARTHRITIS

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Introduction: Thumb carpometacarpal (CMC) osteoarthritis is a common cause of pain, weakness, and functional limitation. First-line conservative management typically includes education, joint protection, exercises, and splinting; however, evidence regarding the feasibility, acceptability, and adherence of different splinting approaches remains limited. Preliminary clinical observations from routine practice have suggested that soft thumb strapping may offer perceived improvements in stability and function, informing the design of a more structured evaluation.

Aim: To assess the feasibility and acceptability of conducting a multicentre randomised controlled trial comparing conservative management strategies for thumb CMC osteoarthritis.

Methods: This study is designed as a multicentre, parallel-group pilot feasibility randomised controlled trial. Adults with clinically or radiographically diagnosed early-to-moderate thumb CMC osteoarthritis will be recruited across multiple clinical sites. Participants will be randomised to one of three intervention groups for a three-week period:

1. Exercise and joint protection advice alone
2. Exercise and joint protection advice plus an NRX soft strap
3. Exercise and joint protection advice plus a usual care splint routinely prescribed in participating clinic

Primary outcomes will focus on feasibility parameters, including recruitment and retention rates, adherence, acceptability, and completeness of outcome data. Secondary exploratory outcomes will include pain, hand function, and patient-reported global change.

Ethical Considerations: Ethical approval is being sought from appropriate Research Ethics Committees. The study will be conducted in accordance with the Declaration of Helsinki and relevant research governance frameworks. Any potential conflicts of interest related to the NRX soft strap will be transparently declared and managed.

Expected Impact: This pilot study will provide essential feasibility data to inform the design of a future fully powered multicentre RCT and support evidence-based conservative management of thumb CMC osteoarthritis.

A-0919 FINDING AND KEEPING THE MYOFASCIAL BALANCE AFTER UPPER EXTREMITY TRAUMA

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Introduction: When addressing scars and adhesions that disrupt AROM, proprioception, sensation and/or the body image of a patient, restoring tissue balance is central to successful outcomes in hand therapy.

Aim: Exploring tissue-specific early active interventions, trauma-sensitive pain management, shared decision finding between interprofessional HCPs and patients to provide enhanced acceptance and outcomes. Integrative approaches to scar management, grounded in evidence-informed practice and clinical experience, including assessment tools, manual and apparative-assisted interventions, in-house and home exercise strategies and topical applications.

Material & Methods: Highlighting interplay between mechanical forces, tissue remodeling, trauma recovery, neurosensory adaptation and biopsychosocial embodiment via case studies and hypotheses

Results: Hand therapists play an important role in guiding patients towards a restored or newly found harmony and have a variety of evidence-based and evidence-informed interventions ready at hand to help patients return to work or ADL and continue independently.

Conclusions: Achieving myofascial balance free of functional restrictions, tensions, adhesions or sensory mismatches is key to upper extremity rehabilitation. Whereas this seems to be already a huge step, the journey continues for our patients – keeping that balance in ongoing life and its demands on an individual and independent level.

A-0920 THE INSIDE-OUT PROGRESSIVE ARTHROSCOPIC WRIST ARTHROLYSIS FOR POST-TRAUMATIC STIFFNESS OF THE RADIOCARPAL AND MIDCARPAL JOINTS

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Background: Wrist stiffness commonly occurs after surgery or trauma and may result from intra-articular, capsular, or extra-articular factors. When conservative treatment fails, arthroscopic arthrolysis can be an effective option to restore range of motion and improve wrist function. The “inside-out progressive arthrolysis” technique offers a systematic, stepwise approach that can be applied to both the radiocarpal (RC) and midcarpal (MC) joints.

Methods: the authors retrospectively reviewed 69 patients (45 males, 24 females; mean age 43 years) who underwent arthroscopic wrist arthrolysis (AWA) for post-traumatic stiffness following distal radius fractures between July 2015 and February 2024. All patients had failed prolonged rehabilitation and presented with functional limitations in wrist flexion, extension, and grip strength. The inside-out progressive arthrolysis technique involved sequential steps in the radiocarpal and midcarpal joints: (1) Resection of intra-articular fibrosis, (2) release of capsular adhesions from carpal bones, (3) capsular resection and (4) bony resection and correction of step-offs. We term the procedure based on the joint RC or MC, and then a number from 1-4, depending upon the extent of the surgery required. The procedure was tailored intraoperatively, with progression based on motion gained after each step.

Results: At a mean follow-up of 23 months, significant improvements were observed in all outcome measures: wrist flexion increased from 28.3° to 62.5° ($p < 0.001$), extension 46.2° to 64.2° ($p < 0.001$), VAS pain scores 7.1 to 2.5 ($p < 0.001$), grip strength 33.3% to 52.7% of the contralateral side ($p < 0.001$), and PRWHE scores 62.5 to 21 ($p < 0.001$). The most frequent RC procedure was RC1–2–3 (31 cases), followed by RC1–2 (15 cases), RC1 (7 cases), and RC1–2–3–4 (6 cases). MC procedures were performed in 9 cases, most commonly MC1–2. No major complications or postoperative instability occurred.

Conclusions: Arthroscopic wrist arthrolysis using the inside-out progressive technique is a safe and effective procedure for post-traumatic wrist stiffness unresponsive to conservative management. The stepwise approach allows individualized treatment, achieves significant pain relief and functional gains, and avoids the morbidity of open surgery.

A-0921 COMPARISON OF METAL-ON-METAL AND METAL-ON-POLYMER MOTEC WRIST ARTHROPLASTY: AN INTERNATIONAL COHORT STUDY AND EXPLANT ANALYSIS

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Introduction: The Motec total wrist arthroplasty (TWA) (Swemac, Sweden) has two material options for the articulating surfaces with a cobalt-chrome (CoCr) head articulating with either a CoCr or carbon-fibre reinforced poly-ether-ether-ketone (CFR-PEEK) cup.

Aims: We aim to compare the use of these two options by means of an international cohort study and explant analysis.

Material & Methods: Six surgeons from five international centres provided clinical details of 171 Motec TWAs including metal-on-metal (MoM) and metal-on-polymer (MoP) implants. Prospectively collected data was analysed retrospectively and the results of each implant compared.

Separately, seven explanted MoP implants were compared with seven explanted MoM implants (metacarpal heads and radial cups). All implants were examined macroscopically and at the nanoscale for changes in articulating surface roughness. These explants were compared with new samples of each material type.

Results: Cohort study: 171 procedures performed on 153 patients were included (113 MoM articulations and 58 MoP articulations). Mean follow-up was 5.8 years (18-months to 12-years). There was no discernible difference when comparing the two types of articulations: 22 (19%) complications occurred in the MoM group compared to 11 (19%) in the MoP group ($p = 1.00$); and 9 (8.0%) revisions in the MoM group compared with 5 (8.6%) in the MoP group ($p = 1.00$).

Explant analysis: Macroscopically 2 of 7 CFR-PEEK cups showed circumferential rim damage. This damage is due to impingement likely associated with weight-bearing activities in-vivo. This was also seen in 4 of the CoCr cups, but with substantially less damage.

Nanoscale roughness measurements of the articulating surfaces showed a change in skewness from positive to negative in both implant types, indicating some material loss in vivo, as would be expected. Roughness decreased for the mean values of metacarpal heads and radial cups in both implant types, which is consistent with self-polishing, a desirable feature. Whilst a minority of CoCr surfaces did become rougher, all of the metal roughness values were less than 50nm Sa, likely within manufacturing tolerances. When compared to unused samples the MoM and MoP implants did not differ significantly in how much their roughness decreased ($p=1.00$ for cups, $p=0.08$ for heads).

Conclusions: Clinical data shows no difference in short-to-medium term complications between MoM and MoP Motec wrists. Short-term explant analysis demonstrates self-polishing and good properties in both material choices. Whilst rim wear is a potential issue in MoP implants, a recently revised implant design likely mitigates this risk. In summary both materials seem to be appropriate choices for wrist arthroplasty.

A-0922 THREE-DIMENSIONAL PLANNING AND PATIENT-SPECIFIC INSTRUMENTATION IN HAND AND WRIST SURGERY. LESSONS LEARNED FROM SELECTED CASES

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Introduction: Three-dimensional (3D) planning and patient-specific instrumentation (PSI) in hand and wrist surgery are indicated for complex anatomical deformities where conventional methods are insufficient.

Aim: Selected cases of corrective osteotomy for distal radius malunion and bone defect after distal radius tumor resection and subsequent prior arthrodesis are presented.

Material & Methods: Case 1: A 45-year-old male patient presented with left distal radius malunion and painful motion deficit after conservatively treated extrarticular fracture 8 months ago. Corrective open wedge osteotomy was performed using volar approach and iliac crest bone graft. 3D printed PSI cutting and drilling guide for the radius and 3D-printed model of the iliac crest bone graft were used.

Case 2: A 42-year-old female presented with mechanical failure and plate breakage after wrist fusion post tumor resection. She had been operated multiple times for giant-cell tumor of distal radius with tumor resection, reconstruction with vascularized fibular graft, and subsequent wrist fusion. 3D preoperative planning and PSI custom-made metal arthrodesis implant were used.

Results: Case 1: Deformation was corrected with postoperative radial height 12.3mm (preoperatively 9.4mm/contralateral 13), negative ulnar variance 0.3 mm (preoperatively +5mm/contralateral 0.6mm), volar tilt 3° (preoperatively dorsal 20.2°/ contralateral volar 11.5°), and radial inclination 23° (preoperatively 17°/ contralateral 26.1°). Postoperative range of motion was improved in 140° from 50° for flexion-extension (contralateral 155°), in 30° from 10° for radial/ulnar deviation (40°), and in 150° from 120° for forearm pronation-supination (170°). Osteotomy union was achieved ten months postoperatively. The patient returned pain free at his job and everyday activities.

Case 2: The patient returned at job office at 4 months postoperatively. There were no major implant-related complications like infection, nonunion or loosening at 6 months follow up. Overall function was good with Disabilities of the Arm, Shoulder, and Hand (DASH) score of 27.5. The appropriate restoration of bone defect size with PSI implant allowed for proper tension of extrinsic hand flexors and extensors and satisfying hand function.

Conclusions: The clinical application of 3D preoperative planning and 3D-printed guides and implants allow for tailored approach of complex deformities where conventional methods are insufficient. For the case of corrective osteotomy of distal radius malunion PSI guides offered superior outcome. The question whether PSI implant (plate) is also needed and if conventional plate was related to delayed healing should be further investigated. For the case of wrist fusion the PSI implant allowed for an accurate fit and stable fusion. The appropriate excursion of hand extrinsic tendons is of paramount importance for proper postoperative functionality.

A-0923 ARTHROSCOPICALLY ASSISTED VOLAR SCAPHOLUNATE CAPSULODESIS FOR EWAS GRADE IIIA: A PROSPECTIVE CASE SERIES STUDY

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Background: The volar SL ligament, despite being relatively thinner than its dorsal counterpart, has important contributions to rotational stability of the SL joint. Volar SL injuries needs high index of suspicion and should be included in the differential

diagnosis of chronic central wrist pain. Currently, there is no gold standard treatment to address these injuries (EWAS IIIA), partly due to rarity, probable under-diagnosing and scarcity of the published studies.

Aim: The current study reports on the functional and radiological outcomes of arthroscopically assisted volar scapholunate capsulodesis for chronic volar scapholunate ligament injury (EWAS grade IIIA). To the best of our knowledge, this study may be the first study reporting on this type of management exclusively carried on for isolated chronic volar SL ligament injury (EWAS grade IIIA).

Material & Methods: A prospective case series on isolated volar chronic scapholunate ligament injury (more than 6 months of symptoms) to whom arthroscopically assisted volar capsulodesis as described by Lui and Kakar** (inside-out technique) was done for all patients.

Combined volar and dorsal SL injuries, Irreducible carpal malalignment, posttraumatic arthritis and associated fractures were excluded. The primary outcome measurements were ROM, VAS score, grip strength, DASH score and modified Mayo score.

The Secondary outcome measurements were radiological SL gap and SL angle.

Results: The mean follow-up averaged 19 months (range, 13–31 months)

Ten patients (5 females and 5 males) were included in the study. The mean age at time of surgery was 26.4 y (range, 20–35 years). The dominant hand was involved in nine cases.

ROM did not change postoperatively. Mean grip strength increased from 65% to 97% of the normal side, VAS significantly decreased from a mean of 7.6 to 1.8 after surgery. Average DASH score improved from 14.98 to 2.91. Similarly, the modified MAYO wrist score improved from a mean of 52 to 91.5. SL gap and SL angle remained unchanged following the index procedure. Dorsal wrist ganglion was associated with 4 cases which were excised during the surgery. Minor complication occurred in one patient in the form of transient paraesthesia of the palmar cutaneous branch of the median nerve which was resolved spontaneously within 3 weeks.

Conclusion: At the short term, arthroscopically assisted volar capsulodesis for chronic volar scapholunate ligament injuries (EWAS grade IIIA) yields satisfactory functional and radiological outcome. However, larger scale and comparative studies are needed to demonstrate consistent favorable outcome and or superiority to other alternative procedures.

Reference: **: Lui H, Kakar S. Arthroscopic-assisted volar scapholunate capsulodesis: a new technique. *J Hand Surg Am.* 2022;47(11):1124–e1.

A-0924 10-YEAR-OUTCOME OF 3-DIMENSIONAL INTRA-ARTICULAR CORRECTIVE OSTEOTOMY FOR MALUNION OF THE DISTAL RADIUS

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Introduction: Intra-articular distal radius malunion can lead to chronic pain, functional impairment, and early osteoarthritis. Three-dimensional (3D) planning with patient-specific instrumentation (PSI) has improved the accuracy of corrective osteotomy in such cases. However, long-term outcomes remain sparsely reported. This study evaluates 10-year clinical and radiographic results following 3D-planned intra-articular corrective osteotomy for distal radius malunion.

Aim: To evaluate long-term clinical results of intra-articular corrective osteotomy for distal radius malunion using 3-dimensional (3D) planning and patient-specific instrumentation (PSI), with a focus on patient satisfaction, range of motion (ROM), grip strength, and functional recovery 10 years postoperatively.

Material & Methods: A retrospective review was conducted of patients who underwent between 2012 and 2016 an intra-

articular corrective osteotomy for distal radius malunion. Clinical evaluation included pre- and postoperative assessment of wrist range of motion, grip strength, and patient-reported outcome measures. Additionally, the need for secondary procedures was documented.

Results: Fifteen patients with a follow-up of 10 years could be included. Median age at the time of surgery was 48.5 years (range 27–66). Nine procedures were performed on the left wrist and six on the right. Eight patients underwent combined extra- and intraarticular procedures, six underwent isolated intraarticular procedures, and one patient had two intraarticular interventions. Hand dominance was right-sided in the majority of patients. All patients were able to return to their previous occupations, including those with manual labor. Eleven patients reported being satisfied or very satisfied with the postoperative outcome, exhibiting full wrist function without pain. Radiographic assessment at 10-year follow-up demonstrated either stable or early-stage radiocarpal osteoarthritis in 9 cases and mild degenerative changes in 2 cases. One patient showed progressive lunate degeneration caused by postoperative ulnar-positive variance and ulnar impaction syndrome, while the radiocarpal joint remained stable. One patient, however, remained dissatisfied due to persistent pain, which limited his occupational capacity as a technician to 50%. Two patients required secondary surgery due to progression of radiocarpal osteoarthritis. One patient underwent a 4-corner fusion, and the other a total wrist arthrodesis. Despite these interventions, both patients reported satisfaction with the clinical outcome.

Overall grip strength improved significantly from 18 kg preoperatively to 32 kg postoperatively, corresponding to a median increase of 78%. Range of motion also improved in most planes, with mean gains of +14° in flexion, +10° in extension, +17° in pronation, and +18° in supination. Flexion, pronation, supination, and grip strength improved significantly, whereas extension as well as radial and ulnar deviation showed no statistically significant change. Two patients with posttraumatic CRPS regained near-normal wrist function, confirming the feasibility of using PSI-guided osteotomy even in neurologically sensitive wrists.

Conclusions: Patients experience sustained pain relief, significant improvements in range of motion across multiple planes, and restoration of functional grip strength at 10-year follow-up. Furthermore, radiographic evaluation revealed no progression of wrist osteoarthritis in over 85% of cases. Three-dimensional planned corrective osteotomy using patient-specific instrumentation demonstrates excellent long-term clinical outcomes in the treatment of distal radius malunion.

A-0925 YOUTUBE AS A SOURCE OF PATIENT EDUCATION FOR SCAPHOID FRACTURES: AN ANALYSIS OF VIDEO RELIABILITY, QUALITY AND CONTENT

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Introduction: Scaphoid fractures are the most common carpal fractures and frequently occur in young, active individuals. These injuries carry a high risk of morbidity when misdiagnosed or inadequately treated. As patients increasingly seek medical information online, platforms such as YouTube, despite lacking peer-review or editorial oversight, have become common sources of patient education.

Aim: This study aimed to evaluate the reliability, quality, and content of YouTube videos pertaining to scaphoid fractures.

Material & Methods: YouTube was queried on 10/11/2025, using the term “Scaphoid Fracture,” and the top 50 relevant videos discussing scaphoid fractures were analysed. Extracted data included upload date, video duration, number of views, likes, dislikes, and comments. Video upload source and content type were categorised. The Video Power Index (VPI) was calculated by dividing the views ratio (views per day since upload) by the like ratio (likes/dislikes). Video source reliability and overall educational quality were assessed using the Journal of the American Medical Association (JAMA) benchmark

criteria and the Global Quality Score (GQS), two validated scales. A novel Scaphoid Fracture Specific Score (SFSS; 0–14) was developed to grade the quality of information specific to scaphoid fractures, evaluating the discussion of patient presentation, background information, diagnosis and evaluation, treatment, and post-operative course.

Results: Most videos were uploaded by physicians (54%), followed by academic institutions (18%) and allied health professionals (12%). The predominant content type was disease-specific information (82%), with surgical technique videos comprising 16%. The average time since upload was approximately 7 years (2437 ± 1312 days), mean video duration was 11 minutes and 28 seconds, and average number of views was 78,251 with cumulative total views across all videos of 3,912,558. Videos averaged 661 likes and 34.5 dislikes, with a mean like ratio of 19.2, mean views ratio of 30.5, and mean VPI of 1.6. Mean educational quality (GQS) score was 2.84 ± 1.31 (range 1–5), and mean reliability (JAMA) score was 1.78 ± 0.65 (range 1–4). The mean disease specific (SFSS) score was 6.66 ± 3.96 (range 1–14).

Conclusions: YouTube videos on scaphoid fractures demonstrate generally low educational quality and reliability, despite most being uploaded by physicians or academic institutions. The SFSS provides a useful framework for evaluating scaphoid-fracture-specific video content. Clinicians should be aware of the suboptimal online information available to patients and offer high-quality educational resources to support patient understanding.

A-0926 STRESS SHIELDING FOLLOWING RADIAL HEAD ARTHROPLASTY AND CORRELATION WITH CLINICAL OUTCOMES

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Introduction: Stress shielding is a well-recognized radiographic finding associated with altered load transfer and subsequent proximal radial bone resorption following radial head arthroplasty. Press fit fixation has been reported to increase the likelihood of this phenomenon; however, its actual clinical significance remains uncertain. Establishing whether stress shielding influences postoperative functional outcomes is essential for optimal implant selection and patient counseling. Aim: The objective of this study was to determine the incidence of stress shielding after radial head arthroplasty and to investigate whether its presence adversely affects clinical function or elbow range of motion.

Material & Methods: A retrospective review was performed on 29 patients who underwent radial head arthroplasty. The cohort had a mean age of 54.3 years. Radiographic assessment focused on the presence of proximal radial bone resorption consistent with stress shielding. Clinical evaluation included the Mayo Elbow Performance Score (MEPS), the Oxford Elbow Score (OES), and range of motion of flexion, extension, pronation, and supination relative to the contralateral limb. Statistical analysis was conducted using the Shapiro Wilk test and independent t tests, with significance set at 0.05. Results: Press fit implants were used in 22 patients, and loose fit implants in 7 patients. Stress shielding was identified in 18 of the 29 patients (62%). Within the press fit subgroup, 17 of 22 patients demonstrated stress shielding (77%). The mean time to detection was 27.5 months postoperatively. No statistically significant differences were observed between patients with and without stress shielding for MEPS (97.9 versus 98.6), OES-pain 98.3 versus 97.4, OES-function 97.6 versus 96.3, OES-psychological 88.5 versus 87, extension deficit 7° versus 5.4° , flexion deficit 3.5° versus 2.5° , and forearm rotation 3° versus 4.8° ($p > 0.05$). There were no significant differences between the press fit and loose fit implant groups ($p > 0.05$). Conclusions: Stress shielding was frequently observed following radial head arthroplasty with press fit fixation (77% at 27.5 months postoperatively); however, it did not demonstrate any measurable impact on functional outcomes or elbow range of motion at mid-term follow up. These findings suggest that, although common radiographically, stress shielding should not be considered a clinically detrimental phenomenon in this context.

A-0927 BALANCING PRICES CHARGED FOR DISTAL RADIUS FRACTURE IMPLANTS ACROSS UK HOSPITALS

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Introduction: Management of distal radius fractures requires careful balance between stability, function, and cost. Volar locking plates (VLPs) are widely used, yet little is known about how implant choice and pricing vary across NHS trusts. This imbalance in available information may influence procurement decisions, surgical preferences, and ultimately the value delivered to patients. Understanding national variation is essential to optimise both clinical and financial balance within trauma services.

Aim: To evaluate variation in implant choice and per-patient implant cost for volar locking plates used in distal radius fracture fixation across UK NHS trusts, with a focus on identifying potential imbalances that may influence resource allocation.

Material & Methods: Freedom of Information (FOI) requests were submitted to all NHS trusts in the United Kingdom performing operative fixation of distal radius fractures. Trusts were asked to provide (1) the brand of their standard VLP system, (2) the annual number of VLP procedures performed, and (3) their average cost per patient for the VLP implants used. Responses were collated and anonymised. Statistical analysis was conducted to evaluate variation in cost, including minimum, maximum, mean, and standard deviation. Findings were interpreted in the context of procurement equity.

Results: Seventy five trusts provided responses and forty NHS trusts provided complete figures (n=40). A broad range of commercial implant systems was reported, reflecting diverse procurement strategies and surgeon preference. Annual procedure volumes varied widely between trusts, although these differences did not consistently correlate with implant cost. The average cost per patient across all reporting trusts showed substantial variation, with a maximum of £1,479.00, a minimum of £202.00, and a mean cost of £593.28 (standard deviation £263.70). The ratio between lowest and highest cost exceeded 7:1, highlighting a significant national imbalance in expenditure for ostensibly comparable implants and there was even significant variation for specific implants. Several high-volume trusts reported costs close to or below the national mean, whereas some lower-volume centres reported disproportionately high costs. Overall though, there was a very weak positive correlation co-efficient of 0.06.

Conclusions: This national FOI-based review reveals marked variation in the cost of volar locking plates for distal radius fractures across NHS trusts, despite similar clinical indications. The findings demonstrate a clear imbalance between trusts in terms of procurement efficiency and implant pricing, with potential implications for equity of care and resource utilisation. While differences in implant design or contractual arrangements may explain part of this variation, the magnitude of disparity suggests an opportunity for more coordinated purchasing strategies and improved transparency. Aligning clinical needs with sustainable expenditure could help restore balance between quality, value, and consistency in distal radius fracture management across the NHS.

A-0928 EXPERIENCE WITH FIRST HAND REPLANTATION, INSIGHT, LESSONS, AND OUTCOME AFTER TWO YEARS FOLLOW UP

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Introduction: hand replantation is an established technique but still considered as an overwhelming and complex procedure with uncertain outcome

Aim: to present our first hand replantation in a major trauma centre. We share our experience going through the process and surgical procedure and importance of planning and team work, that we believe resulted in a shorter operating time and enhanced outcome

Material & Methods: we present a case of a traumatic complete amputation at distal forearm level in an adult male that we successfully replanted at our hospital. We share aspects of our approach, surgical technique and pre and intra operative planning, We present challenges and outcome after two years follow up, and also discuss an updated brief review of the literature

Results: the replantation was successful and patient recovered well, he was very compliant with our hand therapist throughout rehabilitation protocol. After two years he managed to achieve a satisfactory good functional outcome and use of his hand. he is happy with the results

Conclusions: hand replantation is an established technique, and could be reasonably and confidently contemplated by hand surgeons managing trauma. Team work with pre operative planning and intra operative coordination are essential and can reduce operating time and enhance outcome

A-0929 DEVELOPMENT AND VALIDATION OF A PRACTICAL RISK SCORE FOR AMYLOID SAMPLING DURING CARPAL TUNNEL RELEASE

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Introduction: Carpal tunnel syndrome (CTS) has been recognized as a musculoskeletal manifestation that frequently precedes the onset of cardiac involvement in transthyretin (ATTR) amyloidosis. As disease-modifying therapies become more widely available, early identification of amyloid deposits has become increasingly important. Carpal tunnel release (CTR) offers a unique opportunity to obtain tissue specimens that may reveal amyloid deposition. However, in daily hand surgery practice, there is no consensus regarding which patients should undergo pathological sampling, and decision-making remains largely dependent on individual judgment. Thus, establishing a simple, clinically practical criterion that hand surgeons can apply during routine CTS evaluation is necessary to enhance early detection and appropriate referral for systemic assessment.

Aim: This study aimed to develop an intuitive and easily applicable scoring system—the Amyloid Risk Index for Sampling Assessment—that can be incorporated seamlessly into the clinical workflow of CTS evaluation. A second objective was to assess the validity of this scoring system in predicting amyloid positivity and identifying patients who may require systemic treatment for ATTR amyloidosis.

Material & Methods: We reviewed 181 CTR cases performed between April 2021 and March 2025. After excluding duplicate procedures and other ineligible cases, 156 patients with finalized pathological results were included for analysis. Based on risk factors reported in large cohort studies and clinical characteristics observed at our institution, we constructed a scoring system incorporating the following elements: The scoring system assigned points as follows: age (50s = 1, 60s = 2, 70s = 3, 80s = 4, ≥90 = 5); relevant medical history (cardiac disease = 1, spinal disease = 1, and trigger finger/tenosynovitis = 1); involvement (bilaterality = 1); sex (male = 1); abnormal DML or pacemaker (pacemaker—NCS not feasible = 1; for females, Bland's grade ≥3 = 1; maximum 1 point). The total score ranged from 0 to 11. We then evaluated amyloid positivity across score strata and determined where patients who eventually required systemic therapy for ATTR wild-type (ATTRwt), hereditary ATTR variant (ATTRv), or AL amyloidosis were located within the scoring distribution.

Results: Patients with a score of ≥4 demonstrated an amyloid positivity rate of 81.7%, indicating a strong association between higher scores and the likelihood of detecting amyloid at the time of CTR. Notably, all cases that subsequently required systemic treatment—

whether ATTRwt, ATTRv, or AL amyloidosis—were included among those scoring ≥ 5 points. This clustering of clinically significant amyloidosis within the higher-score categories supports the utility of the scoring system in identifying patients who benefit most from pathological sampling and further systemic evaluation.
Conclusions: The Amyloid Risk Index for Sampling Assessment provides a practical and clinically intuitive framework for determining when to submit operative specimens for pathological assessment during CTR. A threshold of ≥ 4 points appears appropriate for recommending biopsy, given the substantially elevated detection rate at this level. Furthermore, the finding that all patients requiring systemic therapy scored ≥ 5 suggests that the scoring system captures those with clinically meaningful amyloid disease. Further multi-center validation is warranted to refine cutoff values and establish broader generalizability.

A-0930 OUTCOMES FOLLOWING SURGICAL MANAGEMENT OF FIFTH CARPOMETACARPAL POST-TRAUMATIC ARTHRITIS: A SYSTEMATIC REVIEW

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Introduction: Fracture-dislocations of the ulnar carpometacarpal joint are an important injury to diagnose and treat. They most commonly involve the fifth (+/- the fourth) carpometacarpal joint, and may occur after a fall onto outstretched hand or by punching. These are important injuries to diagnose due to their involvement of the joint and subsequent risk of post-traumatic arthritis if treatment is delayed. Unfortunately, they can be difficult to diagnose on radiographs. Therefore, these injuries are commonly missed and patients may have delayed treatment, resulting in post-traumatic arthritis. This may cause significant pain and functional limitations for patients, affecting their daily activities.

To help patients with these symptoms, there are several different surgical interventions available to manage the arthritis following this injury. These include interposition procedures (tendon/graft), arthroplasty (such as with silastic prosthesis), or arthrodesis (including Dubert's procedure). It is difficult to choose which procedure offers the best outcome, as there is limited evidence available comparing their effectiveness.

Aim: A systematic review to investigate outcomes following surgical management of posttraumatic osteoarthritis following fifth (+/- fourth) carpometacarpal joint injuries.

Material & Methods: After registration on PROSPERO, a comprehensive literature search was conducted across four electronic databases, in concordance with PRISMA guidelines. Studies were screened and included based on pre-defined eligibility criteria, with verification by a second reviewer. Data were extracted and analysed using R studio software. Studies were pooled according to type of surgical intervention.

Results: Of 485 articles identified, 10 retrospective studies were included in the review. A total of 67 patients were included across the studies, with the majority of participants male ($n=58$, 86.6%) and of working age (mean age 37.6 years, range 17-72). No studies directly compared surgical interventions or outcomes compared to conservative management. There were 4 main surgical approaches described; resection arthroplasty, arthrodesis (predominantly using Dubert's procedure), use of tendon constructs (tendon interposition and ECU suspensionplasty), and silicone arthroplasty. The most popular intervention was arthrodesis ($n = 34/67$, 50.7% of included patients). All studies reported improvements in PROMs including pain, function, and satisfaction following surgery, and there was a high rate of return to original occupation ($n = 39/50$, 78%). Most studies described an improvement in grip strength post-operatively, although there was no significant difference in percentage grip strength when split by intervention ($p = 0.067$). There were more reported complications in the arthrodesis group ($n=5$) compared to the other intervention groups.

Conclusions: Patients report improvements in pain, function and return to work following surgical intervention for

posttraumatic osteoarthritis of the fifth carpometacarpal joint. However, due to small patient numbers and variability in study design/outcome measures, comparisons between interventions or conclusions about their relative effectiveness are limited. Larger, comparative studies with standardised outcome measures are needed to aid decision-making for both patients and clinicians.

A-0931 DISTAL DIGITAL NECROSIS AFTER SEPSIS: A TWO-PHASE COMMUNICATION BURDEN FROM ICU SILENCE TO CAPACITIVE FAILURE

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Introduction: Distal digital necrosis (DDN) is a rare but disabling sequela of severe sepsis and vasopressor-supported shock. Beyond mobility and limb salvage, survivors may experience communication disability—initially from ICU voicelessness (intubation/tracheostomy) and later from fingertip loss that undermines taps and swipes on capacitive devices.

Aim: To characterise communication difficulties linked to sepsis-related DDN, including explicit smartphone/touchscreen barriers and patient-led adaptations.

Material & Methods: A rapid qualitative descriptive study was carried out using inductive thematic analysis on publicly accessible, English-language narratives on identified posts on Reddit, Sepsis Alliance “Faces of Sepsis,” EndSepsis, and an NHS hospital news/social feature (search window: 10–14 November 2025; target period: 2015–2025). Inclusion required: explicit sepsis context, evidence of DDN (or imminent fingertip amputation), and communication content (voice, writing, or phone/touchscreen). Closed or login-gated posts were excluded. Data were extracted into a structured sheet; individual quotations were limited to ≤25 words.

Results: The core dataset comprised six narratives pairing DDN with communication difficulty. Two explicitly linked DDN to phone/touchscreen use: (1) a survivor who cannot swipe with fingers post-amputation and now uses thumbs; (2) a caregiver describing poor capacitive response on an Android phone after septic-shock-related partial finger amputations, prompting peer suggestions (voice control, touch-sensitivity adjustments, on-screen navigation, capacitive stylus). Four additional narratives paired DDN with voice impairment or ICU voicelessness (e.g., tracheostomy, whisper-only voice; speech therapy noted).

Conclusions: Sepsis-related DDN produces a two-phase communication burden—ICU silence followed by digital access barriers. Early recognition of these issues and timely introduction of assistive technology or other interventions may help mitigate digital isolation and its psychological impact.

A-0932 CORRECTION OF SCAPHOID DEFORMITY IN SCAPHOID FRACTURE NON-UNION SURGERY – AN ANALYSIS OF PRE-OPERATIVE PLANNING DATA

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Introduction: Scaphoid fracture non-union can lead to pain, stiffness and longer-term, Scaphoid Non-Union Advance Collapse (SNAC), resulting in osteoarthritis and deformity. The fracture non-union usually results in deformity of the scaphoid. Typically, the scaphoid flexes and becomes shorter. This requires correction during scaphoid non-union surgery to restore bony anatomy and wrist mechanics. Autologous bone graft is used to achieve correction of the deformity and aid healing of the bone.

Surgery to heal the non-union can be done using standard radiographs and computer tomography (CT). Alternatively, surgery can be planned using three dimensional (3D) modelling. Knowing the morphology of graft required can be useful for surgeons, especially if the surgery is being performed without 3D planning.

Aim: This study uses pre-operative planning data to assess the angulation of correction required and how much lengthening is needed to restore anatomy. It also reviews the height, shape and volume of the bone graft.

Material & Methods: All patients in this observational study had undergone scaphoid fracture non-union surgery using KLS Martin Individual Patient System (IPS). This involves computer tomography (CT) of both hands from the distal forearm to the fingertips. The non injured hand is used as a guide for planning deformity correction.

The study had a total of 17 patients in the cohort. Two (12%) patients in the group had previous fixations that had failed and were having revision surgery. In this cohort, two (12%) patients were female. Median age was 26 (range 16 to 41) years.

Results: The median angular correction was 23.8 (-21 to 42.5) degrees. The median lengthening of the scaphoid from before to after correction was 3.6 (-2 to 7.3) mm. The shape of the graft was rhomboid in 4 (23.5%), trapezoid in 4 (23.5%) and triangle in 9 (53%) cases. The median graft height was 8.8 (3.6 to 10.9) mm. The median volume was 800.3 (459 to 2085) mm³.

There was one case where the angle, height and volume of graft had to be reduced from the 'ideal' correction when modelled with the contralateral side due access.

Conclusions: This study showed that over half the non-union deformities had a triangular shaped graft. All deformities required angular correction, and most deformities resulted in lengthening of the non-union scaphoid. The height and volume of the graft varied widely.

This can help the surgeon performing this procedure using traditional methods to have an idea of the graft shape and volume as well as the length and angle of correction.

A-0933 COMPARISON OF HAND RESPONSES TO RECIPIENT NERVE STIMULATION IN SEQUENTIAL VARIATIONS OF SUPERCHARGED AIN TRANSFER TO THE ULNAR NERVE

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Introduction: In supercharged end-to-side (SETS) anterior interosseous nerve (AIN) transfer for compressive ulnar neuropathy, selecting the optimal recipient fascicle remains challenging due to weak or absent motor responses.

Aim: We hypothesized that modifying the procedural sequence would improve intraoperative nerve responsiveness, thereby enhancing identification of recipient fascicles in the thumb, four-digits, and hypothenar muscles (three target muscle groups).

Material & Methods: We retrospectively reviewed 52 patients who underwent SETS AIN transfer from 2019 to 2024. Group 1 (n=25) followed this sequence: Elbow decompression-Guyon's canal release-preparation of the Recipient ulnar nerve-Donor harvest-Coaptation of the AIN to ulnar nerve. Group 2 (n=27) followed: Guyon-Recipient-Donor-Elbow-Coaptation. Intraoperative responses to ulnar nerve stimulation were categorized into three muscle groups and graded as 'Definitive'-(2), 'Trace'-(1), or 'No response'-(0). Tourniquet time was recorded at the time of recipient stimulation.

Results: Demographics and preoperative clinical status did not differ significantly between groups. However, tourniquet time was significantly shorter in Group 2 ($P < 0.05$). Group 2 also demonstrated significantly higher responsiveness scores across all three muscle groups ($P < 0.05$). When analyzing all cases, responsiveness in the thumb and four-digits was

significantly associated with total grip strength, key and oppositional pinch strength, specific ulnar-innervated muscle strength, and tourniquet time ($P < 0.05$). For hypotenar responsiveness, only tourniquet time was a significant factor. Conclusions: Optimizing the procedural sequence in SETS AIN transfer enhances intraoperative nerve responsiveness, particularly when Guyon's canal release precedes recipient fascicle preparation. This approach facilitates more accurate fascicle selection and may improve surgical outcomes.

A-0934 CLINICAL FEATURES AND OUTCOMES OF SEQUENTIAL BILATERAL ULNAR SHORTENING OSTEOTOMY WITH TRIANGULAR FIBROCARILAGE COMPLEX FOVEAL REPAIR

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Introduction: When the foveal attachment of the TFCC is disrupted, the ulnar head is prone to dorsal subluxation relative to the sigmoid notch of the radius, a condition that becomes more pronounced under pronation stress. This alteration in the anatomical relationship between the radius and ulna can be observed on plain radiographs, often manifesting as changes in radiological parameters, such as an increase in UV.

Aim: To retrospectively analyze the clinical features and surgical outcomes of a distinct subgroup of patients who underwent sequential bilateral ulnar shortening osteotomy (USO) with arthroscopic triangular fibrocartilage complex (TFCC) foveal repair for ulnar impaction syndrome (UIS) with distal radioulnar joint instability, despite having no clear history of major or minor trauma, and to contextualize these findings within the literature.

Material & Methods: A retrospective review was conducted of 26 patients who underwent bilateral USO with TFCC foveal repair between 2015 and 2022, with at least 2 years of follow-up for each wrist. The inclusion criteria were radiologically positive ulnar variance (>3 mm), arthroscopic evidence of lunate chondromalacia, definitive foveal TFCC detachment, and distal radioulnar joint instability in both wrists.

Results: In 88% of the patients, the initial surgery was performed on the dominant side. The mean age was 34.08 ± 4.91 years, and the male to female ratio was 16:10. All preoperative statuses clearly improved at the final follow-up (mean of 30.0 months). Subsequent surgeries were conducted on the contralateral side with a mean interval of 15.7 months. Concurrently, statistically significant improvement compared with the preoperative status was seen at a mean of 29.3 months of follow-up. Compared with the condition at the initial surgery, the contralateral surgery group presented less preoperative deterioration in grip strength, VAS score, MMWS, and DASH score. However, both groups showed comparable improvements in all outcome measures at the final follow-up.

Conclusions: Sequential bilateral USO with TFCC foveal repair yielded consistently favorable outcomes, regardless of surgical side or baseline functional deficit. The short interval between surgeries and the absence of a history of trauma suggest that contralateral pathology may develop in the context of degenerative changes, potentially influenced by compensatory overuse during postoperative recovery.

A-0935 COMPARING FUNCTION, PAIN, AND SATISFACTION IN PATIENTS AFTER CMC1 JOINT REPLACEMENT WITH AND WITHOUT HAND THERAPY INTERVENTION

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Introduction: CMC1 joint replacement for osteoarthritis has become increasingly common in recent years. Despite this trend, manufacturers' guidelines do not require structured post-operative therapy, and no standardized rehabilitation protocol has been established to date.

Aim: To examine whether occupational therapy (Hand therapist, OT) intervention following CMC1 arthroplasty improves functional outcomes, pain levels, and patient satisfaction compared to standard surgeon instructions alone.

Methods and Materials:

Twenty-three patients over age 45 diagnosed with Eaton stage 2–3 CMC1 osteoarthritis and undergoing primary CMC1 joint replacement were recruited (11 –intervention; 12 control) adjusted by age. Exclusion criteria included additional hand surgeries and a history of psychiatric illness. All participants completed a pre-operative baseline assessment, a follow-up at ~2 weeks post-surgery, and a final assessment at 3 months.

Outcome measures included subjective and objective measurements.

- Boston Carpal Tunnel Questionnaire (BCTQ–SSS) as part of PROMIS,
- Visual Analog Scale (VAS) for pain,
- MY-ADL observational assessment for functional performance and pain during activity,
- Goniometric range of motion, hand-grip dynamometry, and pinch strength.

Hypotheses predicted reduced pain, improved function, and higher satisfaction in the intervention group.

Results: Significant improvement was found in the intervention group in functional satisfaction for eating/cutting ($p = .006$) and bottle-opening/pouring ($p = .013$), with no significant change in the control group ($p > .18$).

Pain during MY-ADL tasks decreased significantly in the intervention group ($p = .004, .033$), as did BCTQ–SSS scores ($p = .037$). In the control group, only the BCTQ–SSS showed improvement ($p = .012$).

General pain levels (VAS) decreased from 7.0 to 2.9 in the intervention group and from 6.0 to 3.3 in the control group, showing a significant time effect ($F(2,15) = 13.86, p < .001$) but no between-group difference ($p = .40$).

Between-group comparison of change scores (Δ) showed a significant advantage for the intervention group in the eating/cutting task ($p = .022$), with non-significant trends favoring OT in other functional and strength measures.

Conclusion: Early occupational therapy following CMC1 arthroplasty contributed to meaningful improvements in perceived function and reductions in activity-related pain. However, general pain reduction (VAS) and improvements in subjective ROM and strength were similar between groups. These findings support the added value of OT in functional recovery during the early post-operative phase.

A-0936 OPTIMIZING AUTOLOGOUS NERVE COVERAGE TECHNIQUES FOR RECURRENT CARPAL TUNNEL SYNDROME: A META-ANALYSIS AND PREDICTIVE MODELING FRAMEWORK

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Introduction: Recurrent or persistent carpal tunnel syndrome presents a significant therapeutic challenge, with around 5% to 10% of patients experiencing failure after initial surgical management. When a simple re-release is not feasible due to extensive scarring or multiple previous surgeries, autologous nerve coverage techniques offer an alternative approach. However, the optimal coverage technique remains uncertain.

Aim: We conducted a systematic review and meta-analysis to compare outcomes across different autologous nerve coverage techniques and identify factors influencing success.

Material & Methods: Following PRISMA 2020 guidelines, we searched multiple databases without date or language restrictions. Studies including at least ten patients undergoing autologous nerve coverage for recurrent/persistent carpal tunnel syndrome were included. Primary outcomes included overall improvement, complete symptom relief, patient satisfaction, and pain improvement. Random-effects meta-analysis was performed, and correlations between biological properties and outcomes were analyzed.

Results: Twenty-six studies with total of 585 patients and 607 hands, evaluating eight different techniques were included. The hypothenar fat pad flap demonstrated superior complete symptom resolution (69.7%, 95%CI:61.1–78.4%) compared to the synovial flap (26.3%, 95%CI:17.6–34.9%). Longer intervals between surgeries (OR:2.36, P-value = 0.001), fewer prior procedures (OR:3.57, P-value < 0.001), and absence of diabetes (OR:0.47, P-value = 0.002) or rheumatoid arthritis (OR:0.35, P-value = 0.003) strongly predicted favorable outcomes. Regenerative potential ($r = 0.53$, P-value = 0.015), vascularization ($r = 0.48$, P-value = 0.037), and tissue thickness ($r = 0.41$, P-value = 0.044) significantly correlated with success.

Conclusions: The hypothenar fat pad flap achieves the best outcomes for most revision scenarios due to its balanced biological properties. When feasible, revision surgery should be delayed beyond 12 months from the first procedure. Patient-specific factors significantly impact outcomes and should guide technique selection. Future studies should focus on prospective comparative studies with standardized outcome measures and validated risk stratification models to refine patient-specific treatment algorithms.

A-0937 EFFECT OF TIME FROM INJURY TO SURGERY ON SURGICAL TECHNIQUE AND COMPLICATION RATE IN DISTAL BICEPS TENDON REPAIR

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Introduction: Surgical treatment options for distal biceps tendon ruptures vary based on time from injury to surgery. While direct repair (DR) is preferred for acute injuries, high flexion angle (HFA) repair and allograft reconstruction (AR) are alternatives for chronic cases.

Aim: This study examines the relationship between time to surgery, surgical technique selection, and complication rates.

Material & Methods: A retrospective chart review was conducted on patients treated surgically for distal biceps tendon ruptures at a single center from January 2012 to June 2023. Cases were identified through electronic medical records and

included patients aged ≥ 18 years with unilateral ruptures. Demographics, time to surgery, surgical techniques (DR, HFA repair, and AR), and complications were recorded. Descriptive statistics and multinomial logistic regression were used to assess the association between time to surgery and surgical technique.

Results: A total of 373 patients were included, with 90% undergoing DR ($n = 334$), 6% HFA repair ($n = 22$), and 5% AR ($n = 17$). The mean (standard deviation) time from injury to surgery was 16 (± 30) days for DR, 82 (± 162) days for HFA repair, and 274 (± 455) days for AR. Surgical technique selection was significantly associated with time to surgery (Kruskal Wallis $P < .001$), with DR favored in acute cases and HFA repair/AR in chronic presentations. The inflection point for equal probabilities of DR, HFA repair, and AR occurred at 25-27 weeks postinjury. The overall complication rate was 12% ($n = 45$), with nerve injuries being the most common (7%, $n = 25$).

Conclusions: Timing significantly impacts surgical technique selection in distal biceps tendon ruptures. DR remains the standard for acute injuries, while HFA repair and AR are viable options for chronic cases. The multinomial probability graphic can be used to educate and counsel patients on surgical decision-making for chronic distal biceps ruptures.

A-0938 "MAGIC AGE" FOR BONE REMODELLING OF PAEDIATRIC PHALANGEAL NECK FRACTURES

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Introduction: There is controversy in the management of displaced phalangeal neck fractures. Some authors considered displaced fractures with bone-to-bone contact (Al-Qattan type II) are considered unstable and require surgery. However, recent studies demonstrate significant remodelling potential in displaced phalangeal neck fractures. Moreover, the degree of remodelling for phalangeal neck fractures at different ages remain debated, unlikely distal radius fractures where acceptable limits of angulation are established for various ages. To address this knowledge gap, we conducted a single-centre retrospective study of paediatric phalangeal neck fractures.

Aim: Our primary aims were to determine (1) whether displaced fractures remodel significantly over time, (2) whether patient age predicts the degree of radiographic correction, and (3) whether remodelled fractures correlate with the range-of-motion (ROM) outcomes in the injured digit.

Material & Methods: This retrospective study reviewed patients aged 16 years and younger with displaced phalangeal neck fractures treated conservatively at a tertiary hospital in Singapore from January 2017 to December 2023. Coronal and sagittal angulation and translation were measured on posteroanterior (PA) and lateral radiographs at initial visit and final follow-up visit. Displaced phalangeal neck fractures were defined as having more than 10° of coronal or sagittal angulation, or any translation in coronal or sagittal plane on the initial radiographs. Only displaced fractures were analysed. Remodelling was calculated by subtracting the final from the initial measurement.

Results: A total of 87 patients were included in the study. There was significant remodelling in both the coronal and sagittal planes with conservative management. When correlated with age, there was a significant positive correlation between the difference in the sagittal angulation/translation and age with a medium effect size. This indicates that younger patients tend to have a better remodeling potential especially in the sagittal plane. There was significant difference in the change of sagittal angulation and translation up to age 8. The "magic age" with higher remodeling potential in the sagittal plane was therefore age ≤ 8 . The clinical outcome in terms of the range-of-motion of the digit was significantly affected by the final sagittal and coronal translation.

Conclusions: In displaced paediatric phalangeal neck fractures, there is significant bone remodeling in the coronal and sagittal planes, with younger patients having more remodeling in the sagittal plane. The "magic age" with a higher

remodeling potential was ≤ 8 . Generally patients have good total active motion of the digit after conservative management. Prospective multicentre studies with standardized functional scores are needed to define evidence-based angulation/translation thresholds that mandate fixation.

A-0939 TEACHING THE NEW GENERATION. HOW DOES 3D PRINTED PIPJ FRACTURE MODELS HELP, A PILOT STUDY?

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Introduction: Hand injuries are among the most frequent reasons for emergency department visits, with finger fractures showing an annual incidence of 68 per 100,000 individuals and accounting for 0.2–3% of emergency consultations in the United States. Proximal interphalangeal (PIP) joint fractures are particularly complex and remain challenging to manage despite numerous treatment options. They typically result from axial compression during sports injuries, producing fracture patterns that vary from dorsal or palmar avulsions to central impaction fractures, depending on finger position at the time of impact. Treatment aims to restore joint congruence and preserve mobility, requiring refined surgical skills, spatial awareness, and meticulous planning—competencies acquired only through experience. Trainees in hand surgery are expected to treat at least 20–40 finger fractures, yet the steep learning curve may hinder optimal outcomes. Patient-specific 3D-printed fracture models could offer valuable support by translating two-dimensional CT data into tactile three-dimensional representations, enhancing spatial understanding and preoperative planning. Such models are already used in acute care and surgical training in fields including orthopaedics and neurosurgery. The aim of this study was therefore to investigate this potential benefit.

Aim: The aim of this study was to evaluate the potential educational benefit of 3D-printed fracture models for inexperienced hand surgeons.

Material & Methods: Individuals with PIP joint fractures meeting the inclusion criteria were retrospectively identified. Pre-operative CT scans were processed using segmentation software to generate patient-specific 3D models, which were subsequently printed. Four assessors (two Tang Level IV, two Tang Level I) classified each fracture and selected an operative treatment plan based on CT images, and then repeated the assessment using the corresponding 3D-printed model. Differences in fracture classification, changes in treatment decisions, and inter-observer variability were analysed. **Results:** A total of 20 PIP joint fractures met the inclusion criteria and were included in the analysis. Fracture classification based solely on CT images showed considerable inter-observer variability, particularly among the Tang Level I assessors. When using the 3D-printed models, the overall agreement on fracture classification increased, with the greatest improvement observed in complex impaction and multifragmentary patterns.

Across all assessors, treatment plans were modified in a relevant proportion of cases after evaluation of the 3D-printed models. The highest rate of change was again seen among the less experienced assessors. For the majority of fractures, the use of the 3D models resulted in more consistent operative recommendations between observers. Overall, the incorporation of patient-specific 3D-printed models reduced inter-observer variability and improved decision-making accuracy in the assessment of PIP joint fractures. Further the less experienced assessors considered the 3D models to be of significant educational value.

Conclusions: This study demonstrates that patient-specific 3D-printed models substantially enhance the assessment of PIP joint fractures. They increase diagnostic agreement, provide particular support for less experienced assessors, and lead to more consistent and well-founded therapeutic decisions. Thus, 3D models represent a valuable addition to preoperative planning and may contribute significantly to improving surgical training and overall treatment quality.

A-0940 REPAIR OF IATROGENIC MEDIAN NERVE INJURIES AFTER ENDOSCOPIC CARPAL TUNNEL RELEASE

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Introduction: Iatrogenic median nerve injury after carpal tunnel release is a devastating complication of what is wrongfully considered "simple" surgery. Repair of such lesions necessitates knowledge of the macroscopic and intrafascicular anatomy of the median nerve and its variations, as well as knowledge of the vascular anatomy of the hand and its variations.

Aim: To describe intraoperative findings, surgical techniques and results of the repair of 8 iatrogenic median nerve injuries after endoscopic carpal tunnel release with a single portal (Agee) technique.

Material & Methods: Case series of 8 patients, mean age 49 (32-67) operated at a mean time of 6 (3-13) weeks after the original injury. All lesions were partial lacerations, in 2 vascular structures were also involved. The prevalent (all but two) site of injury was at the radial distal end of the carpal tunnel. Six lesions were treated with end to end fascicular repair and 2 with nerve grafting. In 3 the motor branch of the median nerve was repaired.

Results: At a mean follow-up of 35 (9-72) months restoration of sensation was satisfactory (mean 2-point discrimination 7.7 (7-10)) and thumb opposition was restored in all patients. Nevertheless 3 patients reported altered sensation and function of the hand. Meaningful recovery was reported after the 4th month in all patients.

Conclusions: The surgical technique in endoscopic carpal tunnel release must be meticulously observed and, when in doubt, converted to an open technique. When operating on iatrogenic injuries one must be prepared for anatomic variations, complex intraneural topography of motor fascicles, need for nerve grafting and the possibility of vascular injuries.

A-0941 A NEW, ANATOMIC, SINGLE ANTERIOR INCISION, POSTERIOR TO ANTERIOR DISTAL BICEPS REPAIR TECHNIQUE

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Introduction: Anterior, single incision techniques have dominated in recent years the repair of distal biceps ruptures, largely because of the incidence of heterotopic ossification with double (anterior and posterior) incision techniques. However, with the anterior incision the anatomic reinsertion of the tendon to the tip of the bicipital tuberosity is difficult (if not unattainable), especially in muscular individuals (which are the norm for this injury). As a consequence the tendon is usually reinserted in the anterior surface of the tuberosity, minimizing its supination momentum and its ability to restore supination strength, which is the most important functional consequence of distal biceps rupture..

Aim: To propose a new technique to anatomically reinsert the biceps tendon through a single anterior incision

Material & Methods: The new technique has been applied to 38 male individuals with acute (within one month from injury) distal biceps ruptures. It can also be modified to accommodate distal biceps reconstruction with allograft or autograft in chronic ruptures. The technique includes using two parallel sutures in the distal biceps stump in a semi-Krackow configuration to replicate the long and short head components of the distal biceps tendon. Then, a 3.5-4.5mm drill hole is created on the anterior surface of the tuberosity and the sutures are passed from Posterior to Anterior through the hole and are tied over an endo-button on the anterior surface (as opposed to the endo-button being on the posterior surface with the traditional end-button techniques). The patients are kept in a simple elbow sling for 5 weeks and active motion is started at 3 weeks postoperatively. Heavier lifting is allowed at 10 weeks

Results: In the 38 patient cohort we had one early re-rupture (suture failure) and one case of heterotopic ossification requiring re-operation. We had one more case of minor heterotypic ossification not blocking motion. The rest of the

patients healed uneventfully with full range of motion and returned to their previous occupation and athletic activities with M5 supination strength at manual testing.

Conclusions: This technique provides strong fixation (2 sutures and end-button) and sutures are tied over the undo-button in direct view. It restores the anatomic insertion (and the supination momentum of the tendon), provides ample tendon to bone contact, requires minimal immobilization, avoids big holes to the radius (and the danger of fracture) and can be modified to accommodate reconstruction in chronic cases.

A-0942 PROPHYLACTIC REGENERATIVE PERIPHERAL NERVE INTERFACE TO PREVENT NEUROPATHIC PAIN AND NEUROMA FORMATION: A SYSTEMATIC REVIEW

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Introduction: Compared to targeted muscle reinnervation (TMR), the effectiveness of regenerative peripheral nerve interface (RPNI) as a prophylactic strategy against the development of postoperative neuropathic pain has been underexplored.

Aim: This systematic review aims to consolidate recent literature investigating the effectiveness of prophylactic RPNI surgery on a range of postoperative factors related to neuroma formation in patients undergoing major limb amputations and other procedures involving nerve transection.

Material & Methods: A comprehensive search across PubMed, Scopus, and Embase databases was conducted according to PRISMA guidelines. Included studies evaluated outcomes related to postoperative painful neuroma formation in adults undergoing surgery with prophylactic RPNI. Outcomes related to a range of postoperative factors including neuroma formation, pain intensity, and psychosocial wellbeing were evaluated.

Results: The search identified 91 unique references, of which 27 studies met inclusion criteria. These included case reports, case series, non-comparative cohorts, and five comparative cohort studies published between 2019–2025. RPNI was performed prophylactically in both major limb amputations and non-amputation nerve transection procedures, with additional studies evaluating hybrid techniques such as vRPNI, VDMT, DSPNI, and TMRpni. Follow-up ranged from 6 weeks to 92 months. Across all upper-extremity studies reporting pain, patients demonstrated postoperative improvement in residual limb pain, phantom pain, or localized neuropathic pain. Comparative data showed significantly lower pain intensity with RPNI compared to controls, including reduced PROMIS Pain Interference scores and lower NRS pain (3.1 vs 6.9, $p < 0.001$). Symptomatic neuromas were not observed in any upper-extremity RPNI cases, whereas neuromas occurred in 13–21% of controls. Three studies noted reduced postoperative analgesic requirements. For RPNI in all patient types, including both upper and lower extremities, RPNI patients were more likely to achieve pain-free status (66% vs 14%) and exhibited no symptomatic neuroma formation compared with 15–21% in controls. Among amputation cohorts, patients receiving RPNI adopted prostheses at higher rates and demonstrated improved independent ambulation. Psychosocial measures, including sleep, anxiety, and daily activity interference, also improved consistently. Case series additionally reported successful resolution of chronic intercostal neuralgia, migraine-related supraorbital pain, and donor-site neuroma pain following RPNI.

Conclusions: Our analysis indicates that, based on the current literature, prophylactic regenerative peripheral nerve interface (RPNI) performed during amputation appears to be effective in reducing, if not entirely preventing, the formation of neuromas in the postoperative period. Additionally, our review implies that RPNI may contribute to alleviating general

postoperative pain and paresthesias, including phantom limb sensations. Given that the nerve interfacing techniques utilized vary across studies, some combining RPNI with targeted muscle reinnervation (TMR) and/or other methodologies, further research is essential to enhance our understanding of the most effective strategies for managing post-amputation pain and preventing neuromas. As the discourse surrounding prophylactic RPNI continues to evolve, this analysis aims to address the methodological limitations identified in existing studies, thereby guiding future research on postoperative neuralgia, pain management, and neuroma prevention.

A-0943 CLINICAL AND DEMOGRAPHIC DIFFERENCES BETWEEN DUPUYTREN'S DISEASE AND CARPAL TUNNEL SYNDROME IN A SOUTHERN EUROPEAN POPULATION

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Introduction: Dupuytren's disease (DD) and carpal tunnel syndrome (CTS) are two of the most frequent hand conditions treated by orthopaedic and hand surgeons. Both have been associated with metabolic and occupational risk factors, but they show different clinical patterns. Comparative clinical data from Southern European populations are limited. We aimed to compare the demographic and clinical profile of patients surgically treated for DD and CTS in a Mediterranean tertiary hospital.

Aim: To describe and compare the clinical and demographic characteristics of patients undergoing surgery for DD and CTS in a single centre, focusing on age, sex distribution, laterality, symptom duration and major comorbidities.

Material & Methods: We conducted a retrospective observational cohort study including all consecutive patients who underwent fasciectomy for DD or open decompression for CTS between 2016 and 2018 in our institution. Clinical data were obtained from medical records and a prospectively maintained database. Variables analysed were age, sex, affected hand (unilateral or bilateral), symptom duration, family history, Tubiana stage (for DD), and the presence of diabetes, smoking, alcohol consumption and occupational or traumatic risk factors. Only clinical and epidemiological variables were evaluated; no laboratory or histological data were included in this analysis. Descriptive statistics were used to summarise both cohorts.

Results: A total of 43 patients were included: 26 with DD and 17 with CTS used as a clinical control group. DD patients were predominantly male (25 of 26, 96.2 per cent), whereas CTS patients were mainly female (12 of 17, 70.6 per cent). Mean age was 62.1 years (standard deviation 9.2) in the DD group and 54.4 years (standard deviation 16.8) in the CTS group. Symptom duration before surgery was similar in both cohorts (4.7 versus 4.0 years). Bilateral hand involvement was frequent in both conditions (53.8 per cent in DD and 58.8 per cent in CTS). In the DD cohort, mean Tubiana stage at surgery was 2.0, and half of the patients were classified as stage II. Diabetes was present in 23.1 per cent of DD patients and 11.8 per cent of CTS patients. Smoking was documented in 53.8 per cent of DD and 35.3 per cent of CTS cases. Regular alcohol use was more common in DD (38.5 per cent) than in CTS (5.9 per cent). Occupational manual work was recorded as a potential risk factor in 23.1 per cent of DD patients and was uncommon in CTS.

Conclusions: Dupuytren's disease and carpal tunnel syndrome show clearly different demographic and clinical profiles in our Mediterranean population. DD predominantly affects older males and is strongly associated with smoking, alcohol consumption and occupational manual work, whereas CTS mainly affects middle-aged women and presents with a lower burden of metabolic and lifestyle-related comorbidities. Despite similar symptom duration and comparable rates of bilateral involvement, the underlying risk patterns differ substantially. These findings highlight that DD and CTS represent two

distinct clinical entities with specific epidemiological signatures, and that recognising these profiles may help optimise patient counselling, early identification of high-risk individuals and surgical planning in hand units.

A-0944 FLEXION OF THE DISTAL INTERPHALANGEAL JOINT IS THE MAIN PREDICTOR OF FUNCTIONAL RECOVERY AFTER ZONE II FLEXOR TENDON INJURY

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Introduction: Flexor tendon injuries in zone II are frequent and disabling due to tendon retraction, adhesions and postoperative stiffness, often limiting finger flexion and overall hand function. Existing functional classifications primarily rely on global range-of-motion scores and may classify patients with significant proximal or distal interphalangeal deficits as “good” or “excellent”, potentially underestimating clinically relevant impairment.

Aim: To determine which demographic, clinical or biomechanical variables predict functional outcomes after flexor tendon injury in zone II, and to analyse the relationship between functional results and digital-specific functional scales (Tang, Strickland) or global functional scores (QuickDASH, Modified Mayo Wrist Score).

Material & Methods: A prospective clinical study was conducted including patients surgically treated for flexor tendon injuries in zone II between 2017 and 2023. Epidemiological, clinical and intraoperative variables were recorded. Functional evaluation at 12 months included pain (VAS), range of motion of MCP, PIP and DIP joints using goniometry, Tang Index, Strickland Index, grip strength measured with a Jamar dynamometer, QuickDASH and the Modified Mayo Wrist Score. Statistical analysis included normality testing, non-parametric comparisons and Spearman correlations, with significance as $p < 0.05$.

Results: Thirty patients with flexor tendon rupture in zone II were included. Mean age was 36 years, 72% were male and 30% performed manual labour. Injuries affected the right hand in 63% of cases, mainly due to sharp mechanisms (88%). Most patients had one digit involved (76%), with a median of two tendons injured. Associated fractures occurred in 27%, vascular injuries in 16% and neurological lesions in 25%. Tenorrhaphy was performed in 82% of cases using Kessler sutures. At 12-month follow-up, mean joint mobility ranged from MCP 0–110°, PIP 0–90° and DIP 0–60°, with a median palm-to-finger distance of 0 cm (0–1.5). All patients achieved more than 75% grip strength compared with the contralateral side. Pain was absent in 70% of cases, occasional in 21% and moderate in 9%. Functional outcomes were excellent in 51%, good in 21%, moderate in 6% and poor in 2%, with 91% returning to work. The Tang index showed a median of 0.74 (0.62–0.91); categorical Tang results were 41% excellent, 38% fair, 17% good and 3% poor. Strickland Index median was 0.65 (0.57–0.88). QuickDASH was 0.02 (0.00–0.06) and the Modified Mayo Wrist Score 0.80 (0.80–1.00). Global functional category was predicted by DIP mobility ($p = 0.03$). The Tang Index was associated with DIP ($p = 0.001$) and MCP mobility ($p = 0.02$), and the Strickland Index with DIP ($p = 0.001$) and MCP mobility ($p = 0.04$). Categorical Tang results were associated with PIP ($p = 0.01$) and DIP mobility ($p = 0.01$). Tang and Strickland scores correlated strongly ($\rho = 0.71$, $p = 0.001$), whereas neither correlated with QuickDASH or the Modified Mayo Wrist Score. QuickDASH and the Mayo Wrist Score showed moderate correlation ($\rho = 0.43$, $p = 0.017$).

Conclusions: DIP joint mobility is the strongest and most consistent predictor of functional recovery after flexor tendon injury in zone II. These findings highlight the need to prioritise DIP motion restoration and to interpret global functional questionnaires cautiously when assessing outcomes after flexor tendon repair.

A-0945 EVALUATING APPOINTMENT ACCESS DISPARITIES AMONG SPANISH AND MANDARIN-SPEAKING PATIENTS FOR HAND ORTHOPAEDIC CARE IN NEW YORK

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Introduction: Language barriers reduce healthcare access and follow-up rates. In New York, there are approximately 2.7 million Spanish speakers and 700,000 Mandarin speakers, many of whom have Limited English Proficiency (LEP). Previous studies, such as Greene et al. (2019), found that Spanish-speaking patients often rely on non-professional interpreters in hip and knee care, and Sobel et al. (2020) highlighted that academic pediatric orthopaedic centers frequently lack adequate Spanish language support. However, limited research exists on Mandarin-speaking patients' access to care. Rural health staff often rely on untrained interpreters, and disparities in interpreter availability across academic vs. private practice settings and low- vs. high-income areas have been underexplored.

Aim: This study aims to assess whether non-English-speaking (Spanish- and Mandarin-speaking) patients face disparities in appointment scheduling compared to English-speaking patients, compare disparities between Spanish-speaking and Mandarin-speaking patients in appointment scheduling and interpreter services, and compare disparities in interpreter services and appointment access for non-English-speaking patients between academic and private practices, rural and urban areas, and low- and high-income areas.

Material & Methods: Using the AAOS "Find an Orthopaedist" tool, 125 hand orthopaedic practices in New York were identified; 69 accepted Medicare and were included. Each practice received three simulated calls for a 65-year-old patient with carpal tunnel syndrome: one English-speaking, one Spanish-speaking, and one Mandarin-speaking. Non-English calls were made by proxies representing LEP patients. Outcomes included appointment availability, wait time, interpreter access/type, and insurance inquiry. Practices were stratified by setting (academic vs. private), location (urban vs. rural), and income (based on zip code median income). Chi-square and ANOVA were used for analysis.

Results: Appointment access, wait times, call durations, and insurance inquiries did not significantly differ across language groups. Appointments were offered to 94.2% of English-speaking patients, 87.0% of Spanish-speaking patients, and 89.9% of Mandarin-speaking patients ($p = 0.349$). Interpreter access was significantly higher for Spanish-speaking than Mandarin-speaking patients (95.0% vs. 72.6%, $p = 0.002$), with Mandarin speakers more reliant on virtual interpretation (97.8% vs. 66.7%, $p < 0.001$). Interpreter access did not vary significantly by practice type or rurality but was greater in low-income than high-income areas (96.0% vs. 63.8%, $p < 0.001$), especially for Mandarin speakers (92.1% vs. 41.7%, $p < 0.001$). Spanish-speaking patients in low-income areas also relied more on virtual interpreters (78.4% vs. 35.0%, $p = 0.003$) and had less access to in-person services (18.9% vs. 50.0%, $p = 0.032$).

Conclusions: While appointment access was similar across language groups, significant disparities in interpreter availability remain—particularly for Mandarin-speaking patients and those in high-income areas. These findings highlight the need for targeted language access strategies and expanded in-person interpreter services to support equitable orthopaedic care for LEP populations.

A-0946 SEX AND RACIAL DIFFERENCES IN POSTOPERATIVE PAIN AND ANALGESIC USE FOLLOWING HAND SURGERY

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Introduction: Sex- and race-based disparities in postoperative pain and analgesic use are documented in orthopedic surgery but remain underexplored in hand and wrist procedures. Prior studies suggest women often report higher

postoperative pain and racial minorities may experience undertreated pain. This study evaluates whether such disparities exist in postoperative pain intensity and analgesic use among patients undergoing elective hand procedures.

Aim: To identify sex- and race-based differences in postoperative pain and analgesic consumption following elective hand surgery and to understand how demographic factors may influence pain perception and medication use.

Material & Methods: This retrospective analysis used data from a previously conducted randomized controlled trial (ClinicalTrials.gov Identifier: NCT03219177) that enrolled adult patients (≥ 18 years) undergoing elective hand surgery. Exclusion criteria included fractures, pre-existing nonoperative upper-extremity pain, analgesic allergies, inability to take opioids, active substance misuse, and chronic analgesic use. Pain scores (0–10 numeric rating scale), and daily consumption of opioids, acetaminophen, and NSAIDs were recorded from the day of surgery (DOS) through postoperative day (POD) 14. Demographics (age, sex, race), clinical factors, and procedure types were documented. Sex- and race-based differences in pain and analgesic use were analyzed using independent t-tests and one-way ANOVA (significance $p < 0.05$).

Results: A total of 287 patients were included (mean age 59.3 ± 13.7 years; 55.1% female; 83.3% White). The most common procedures were carpal tunnel release (26.5%), trigger finger release (15.3%), and Dupuytren's fasciectomy (9.8%).

Sex differences: Women reported significantly higher maximum postoperative pain than men (2.59 ± 2.63 vs. 1.96 ± 2.35 , $p = 0.033$). Women had higher pain on DOS and POD 1 and 4–14. Total opioid consumption did not differ overall between sexes ($p = 0.138$), but women consumed more on DOS (1.05 ± 1.61 vs. 0.70 ± 1.16 , $p = 0.031$) and POD 7 (0.34 ± 1.40 vs. 0.10 ± 0.39 , $p = 0.039$). Total acetaminophen use was similar ($p = 0.282$); however, women used more on POD 2 ($p = 0.020$). NSAID consumption did not differ overall ($p = 0.092$), although women used more on POD 1–3, 6, and 11 (all $p < 0.05$).

Racial differences: White patients reported significantly lower overall pain compared to Black patients (2.31 ± 2.53 vs. 3.05 ± 2.66 , $p = 0.002$). On DOS, White patients reported lower pain than patients of other races (3.23 ± 3.12 vs. 4.33 ± 3.17 , $p = 0.040$). There were no significant race-based differences in opioid, acetaminophen, or NSAID consumption.

Conclusions: Clinically meaningful sex- and race-based disparities exist in postoperative pain among patients undergoing elective hand surgery. Women consistently reported higher pain and used more analgesics on several postoperative days, despite no difference in total opioid consumption. Black and other non-White patients reported higher pain without differences in analgesic use. These findings highlight the need for standardized and equitable postoperative pain management strategies. Understanding demographic differences in pain experience may help guide more patient-centered analgesic prescribing and reduce disparities in postoperative recovery.

A-0947 CUTTING COSTS, NOT QUALITY: CREPE VS ESMARCH IN UPPER LIMB EXSANGUINATION - A PROSPECTIVE STUDY AND LITERATURE REVIEW

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Aims: Our research aimed to: Review existing literature comparing Crepe and Esmarch bandages in upper limb exsanguination.

Prospectively assess their real-world efficacy at our dedicated hand unit.

Perform a cost utility analysis to evaluate their economic impact in our high-volume hand unit.

Methods: A scoping review was conducted using PRISMA-SCR guidelines to assess both techniques across sterility, sustainability, and clinical efficacy.

A two-week prospective study was performed by the senior author, reviewing 20 upper limb exsanguination cases; 10 using Crepe bandages and 10 using Esmarch. Standardised selection criteria were applied. One minute post-incision, the

quality of the bloodless field was assessed through clinical photography and objective perfusion measurement. A further test guided by the Whiteside technique was performed, where pressure was evaluated by connecting a saline bag to an arterial line, enabling comparison of exsanguination effectiveness between both groups.

A Cost Utility Analysis (CUA) was performed to estimate potential savings with exclusive Crepe bandage use.

Results: The literature review and clinical evaluation demonstrated no significant difference in exsanguination quality between the two bandage types. Both were safe, sterile, and effective.

Our CUA found that with approximately 60 upper limb exsanguinations carried out per week at our hand unit, transitioning to Crepe bandages - costing £0.70 compared to £7.00 for Esmarch - could yield annual savings exceeding £18,000 without compromising patient outcomes.

Conclusion: In today's healthcare climate, where financial pressures and environmental responsibility are growing concerns, it is necessary that treatments deliver high-value, safe, and sustainable care. Both Crepe and Esmarch bandages offer equivalent clinical efficacy. However, Crepe provides a significantly more cost-effective and environmentally sustainable alternative, as it can also be reused for the final dressing. Our findings show that Crepe bandages are a strong candidate for standard practice in our busy hand unit and can be adopted within the wider NHS.

A-0948 ASSOCIATION OF SPLINTING AND HYDRODISTENSION: A POSSIBLE ALTERNATIVE TO TENOLYSIS IN HAND JOINT STIFFNESS?

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Introduction to clinical case: A 65-year-old woman developed significant stiffness of the fifth metacarpophalangeal (MCP) joint following a left distal radius fracture complicated by Complex Regional Pain Syndrome (CRPS) type I. Despite initial improvement with a home-based physiotherapy program using a custom progressive static splint, ROM plateaued in the MCP and proximal interphalangeal (PIP) joints.

Aim: Ultrasound-guided intra-articular hydrodistension—commonly used in frozen shoulder—was proposed as a novel intervention for hand joint stiffness.

Methods: Active and passive ROM of the fifth digit (MCP, PIP, distal interphalangeal) was measured using a Baseline finger goniometer. A daily home protocol included: 60 minutes of static progressive splinting (TERT principle), 2 hours of relative motion orthosis, and strengthening of intrinsic and extrinsic flexors twice daily. Upon reaching a clinical plateau, ultrasound-guided hydrodistension was performed in the MCP joint using 1 mL betamethasone (4 mg), 2 mL lidocaine, and 2 mL saline. Immediate post-procedure mobilization and goniometric reassessment were conducted. Four weeks later, the same procedure was applied to the PIP joint.

Results: Following the MCP hydrodistension, passive ROM improved by 20° (from 65° to 85°); the PIP gained 10° (from 85° to 95°) after the second procedure. Improvements were sustained at 3-week follow-up and maintained up to 10 months with continued adherence to the home program. Out of 17 hand joints affected by stiffness, only 2 required hydrodistension in addition to splinting.

Discussion and clinical relevance: Ultrasound-guided hydrodistension may be an effective adjunct to static progressive splinting in treating MCP and PIP joint hypomobility when clinical progress has plateaued. This combined approach may delay or prevent the need for surgical tenoarthrolysis in cases where ROM is not yet functionally adequate. Importantly,

the intervention can be selectively applied to resistant joints, enhancing the efficiency and personalization of care. The case also demonstrated improvements in subjective hand function and grip strength.

In MCP and PIP joint stiffness unresponsive to splinting alone, ultrasound-guided hydrodistension may offer a safe and effective alternative before surgical intervention. Further studies are warranted to evaluate broader clinical applicability. References: Flowers KR, LaStayo P. Effect of total end range time on improving passive range of motion. *J Hand Ther.* 1994 Jul-Sep;7(3):150-7. doi: 10.1016/s0894-1130(12)80056-1. PMID: 7951706.

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A-0949 COMPARISON OF ANALGESIC EFFECT OF LIGNOCAINE WITH ADRENALINE VS BUPIVACAINE IN POST OPERATIVE PAIN CONTROL

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Introduction: Effective postoperative pain management following fracture fixation is essential for optimising recovery, facilitating early rehabilitation, and reducing analgesic requirements.

Aim: This study compares the analgesic efficacy of lignocaine with adrenaline versus bupivacaine when used for postoperative wound infiltration after distal radius plating.

Material & Methods: In this prospective, randomised controlled trial, 28 patients undergoing distal radius plating were allocated to receive either lignocaine with adrenaline or bupivacaine for wound infiltration following surgical closure. Postoperative pain was assessed using the Visual Analogue Scale (VAS) at multiple time points. Vital signs (blood pressure and pulse rate), time to first rescue analgesia, total rescue analgesic use, and length of hospital stay were recorded.

Results: VAS scores were significantly lower in the lignocaine with adrenaline group at 12 hours ($p = 0.032$) and 24 hours ($p = 0.023$) postoperatively, with no significant differences at 2, 4, 6, or 48 hours. Pulse rate and systolic blood pressure were comparable between groups. The time to first rescue analgesia was significantly longer in the lignocaine with adrenaline group (7.7 hours) compared with the bupivacaine group (7.0 hours; $p = 0.036$). Length of hospital stay did not differ significantly.

Conclusions: Postoperative wound infiltration with lignocaine and adrenaline provides superior intermediate-term analgesia compared with bupivacaine and reduces the need for rescue analgesia following distal radius plating.

A-0950 HYBRID ARTHROSCOPY USING NANOSCOPE AND OPEN REPAIR FOR TFCC LESIONS: CLINICAL OUTCOMES AND PATIENT SATISFACTION

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Introduction: Triangular fibrocartilage complex (TFCC) tears are a common cause of ulnar-sided wrist pain and distal radioulnar joint (DRUJ) instability. Advances in minimally invasive wrist surgery have led to new approaches that combine the diagnostic advantages of arthroscopy with the reliability of open repair.

Aim: This study aimed to evaluate the clinical outcomes and overall patient satisfaction following hybrid arthroscopy using a nanoscope combined with open TFCC repair.

Material & Methods: Twenty consecutive patients with symptomatic TFCC tears underwent hybrid arthroscopy with nanoscopic evaluation and open repair. Postoperative assessment included clinical examination of pain (VAS for pain), range of motion, and DRUJ stability. Overall satisfaction was recorded using a 5-point Likert scale ranging from “very dissatisfied” to “very satisfied.”

Results: All 20 patients completed a minimum follow-up of six months. Clinical improvement was observed in terms of pain reduction and restoration of wrist stability and motion. No major complications or repair failures were reported. VAS decreased from an average of 7.6 (SD 2.1) to 2.1 (SD 2.3). According to the Likert scale, 90% of patients reported being “satisfied” or “very satisfied” with the surgical outcome.

Conclusions: Hybrid arthroscopy using a nanoscope combined with open TFCC repair is a safe and effective technique, allowing precise intraoperative assessment and reliable clinical outcomes. The high level of patient satisfaction supports the value of this hybrid approach in the management of TFCC injuries.

A-0951 OSTEOSARCOPENIA AND NUTRITIONAL STATUS IN OLDER ADULTS UNDERGOING SURGERY FOR DISTAL RADIUS FRACTURES

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Introduction: Distal radius fractures (DRFs) are common fragility fractures among older adults and are frequently associated with underlying sarcopenia, osteoporosis, or malnutrition. These conditions may adversely affect fracture healing, functional recovery, and postoperative outcomes. However, their prevalence and interaction in older DRF patients undergoing surgical treatment remain insufficiently clarified.

Aim: To investigate the prevalence of possible sarcopenia, osteoporosis, and malnutrition in older adults undergoing surgical fixation for DRFs, and to examine their clinical characteristics and interrelationships.

Material & Methods: This prospective observational study included 40 consecutive patients aged ≥ 60 years (4 men and 36 women; mean age 75.5 ± 8.5 years) who sustained low-energy DRFs and underwent surgical fixation. Evaluated parameters included contralateral grip strength (hand-dominance adjusted), calf circumference, SARC-F score, bone mineral density (lumbar spine and total hip T-scores), BMI, Onodera's Prognostic Nutritional Index (PNI), the pre-injury Disabilities of the Arm, Shoulder and Hand (QuickDASH) score, the Hospital Anxiety and Depression Scale (HADS), and radiographic measurements at injury. Possible sarcopenia was defined according to the Asian Working Group for Sarcopenia

(AWGS) 2019 criteria as contralateral grip strength <28 kg in men and <18 kg in women. Osteoporosis was defined as a lumbar spine or total hip T-score < -2.5. Malnutrition was defined as PNI < 50, and osteosarcopenia as the coexistence of possible sarcopenia and osteoporosis. Patients without any of these conditions were categorized as robust; all others were defined as non-robust. Because only four male patients were included, all comparative and correlation analyses were performed exclusively among female patients to ensure statistical validity.

Results: Among all patients, possible sarcopenia was observed in 12 cases, osteoporosis in 17, malnutrition in 19, and osteosarcopenia in 7, while 12 were classified as robust. Among female patients, non-robust individuals were significantly older and exhibited greater ulnar variance at injury compared with robust individuals. Lumbar spine T-scores correlated with PNI and contralateral grip strength. Total hip T-scores correlated with contralateral grip strength, calf circumference, SARC-F, BMI, and pre-injury QuickDASH. Contralateral grip strength correlated with age, SARC-F, pre-injury QuickDASH, and HADS-anxiety.

Conclusions: Sarcopenia, osteoporosis, and malnutrition were highly prevalent and frequently overlapped in older women undergoing surgical treatment for DRFs. These conditions were interrelated and associated with pre-injury functional disability and anxiety. Longitudinal studies are needed to clarify how these factors influence postoperative recovery and to identify determinants of functional outcomes after DRF surgery.

A-0952 FUNCTIONAL AND RADIOGRAPHIC OUTCOMES OF PROSTHETIC VERSUS RESECTION ARTHROPLASTIC SURGERIES FOR TRAPEZIOMETACARPAL ARTHROSIS: A FIVE-YEAR RETROSPECTIVE STUDY

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Introduction: Trapeziometacarpal (TMC) arthrosis is a prevalent degenerative condition, leading to significant functional impairment. When conservative management fails, surgical options such as prosthetic arthroplasty and resection arthroplasty (ligament reconstruction and tendon interposition – LRTI) are commonly performed, yet their comparative effectiveness remains debated.

Aim: The aim of this study is to compare the functional and radiographic outcomes of patients who underwent prosthetic or resection arthroplastic surgery for TMC arthrosis over the past five years at our institution.

Material & Methods: A retrospective analysis of all the patients treated for TMC arthrosis between 2020-2024 at our institution was conducted, with minimum follow-up period of 6 months. Patients were divided into two cohorts: Group-A with those who underwent TMC prosthetic arthroplasty using dual-mobility prostheses and Group-B with those who underwent LRTI. Functional outcomes were assessed using the Kapandji-score, grip and pinch strength. Dual-plane radiographs were taken preoperatively to assess for criteria of inclusion and postoperatively to evaluate implant positioning, subsidence, and joint space maintenance (M1/M2 ratio – length of the first (M1) and second metacarpal (M2)).

Results: We evaluated 134 patients with TMC arthrosis (34 patients in Group-A and 100 in Group-B). No statistically differences were found in Kapandji score, grip and pinch strength between both groups. Although Group-B early functional improvement was slower, they achieved comparable pain relief and functional outcomes at later follow-ups. The preoperative M1/M2 ratio showed no significant difference between groups; however, a statistically significant difference emerged postoperatively, with Group A demonstrating the highest ratio. Only one case of TMC prosthesis failure was observed at 3 months follow-up, requiring revision surgery. No other complications were observed, such as infections or prosthesis dislocations.

Conclusions: The results of this study support that both prosthetic and resection arthroplasty are effective surgical options for trapeziometacarpal arthrosis, with each technique offering distinct benefits. However, TMC prosthetic arthroplasty appears to offer more promising functional outcomes, with better preservation of thumb length. These findings suggest a potential advantage of prosthetic intervention in selected patients. Further prospective studies are needed to validate these findings and optimize treatment selection.

A-0954 DELAYED PRESENTATION OF A KAPLAN LESION OF A 7-YEAR-OLD PATIENT

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Introduction: We present the case of a 7-year-old boy with pain and restricted motion of the right index finger one week after sustaining an axial impact injury. Initial radiographs obtained externally revealed no pathological findings, and the patient was immobilized in a cast splint for analgesia.

Upon evaluation in our outpatient clinic, clinical examination demonstrated marked palmar tenderness and a fixed hyperextension deformity of the MCP II joint, with preserved mobility of the PIP and DIP joints.

Objective: A Kaplan lesion represents a complex dorsal dislocation of the metacarpophalangeal (MCP) joint characterized by interposition of the palmar plate and adjacent soft tissue structures, rendering closed reduction ineffective. Pediatric hand trauma frequently involves the MCP II joint; however, dislocations in this region are rare and typically occur dorsally following falls onto an extended finger.

In complex MCP dislocations, entrapment of the palmar plate commonly prevents successful closed reduction, necessitating open surgical intervention with reconstruction of the disrupted soft tissues.

Materials and Methods: Biplanar radiographs of the index finger demonstrated a dorsal dislocation of the MCP II joint and an increased joint space between the metacarpal head and the distal phalanx, suggestive of palmar plate interposition. Ultrasonography confirmed a rupture of the palmar joint capsule and a pronounced dorsal subluxation of the MCP II joint. Given the one-week delay after trauma and evidence of a complex injury mechanism, open surgical treatment was indicated.

Intraoperatively, the metacarpal head was found to have perforated the palmar joint capsule, lying directly beneath the flexor tendons, while the palmar plate was displaced dorsally and incarcerated within the joint. The collateral ligaments, flexor tendons, and neurovascular structures remained intact.

Open reduction was performed, followed by suture-based reconstruction of the palmar plate. Post-reduction, the joint demonstrated stability at 50° of flexion and extension, with unrestricted passive MCP flexion. Postoperative management consisted of immobilization in a thermoplastic splint at 30° flexion for 4 weeks while permitting active flexion exercises, followed by a thermoplastic splint at 10° flexion from postoperative week 5 for an additional 2 weeks. Gradual load-bearing was initiated at 6 weeks.

At the 3-month postoperative follow-up, the patient was asymptomatic and exhibited full functional recovery.

Results: Delayed diagnosis of a Kaplan lesion may complicate management due to palmar plate interposition. In this case, open reduction with palmar plate reconstruction is essential for restoring joint stability and function. The increased distance between the metacarpal head and the proximal phalanx is an important radiological sign. If a Kaplan lesion is suspected, it is advisable to perform an additional ultrasound examination

A-0956 A MUSCULAR PERSPECTIVE ON THUMB BALANCE: ELASTOGRAPHIC AND CLINICAL INSIGHT INTO ADDUCTOR POLLICIS STIFFNESS IN CMC-1 OSTEOARTHRITIS

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Introduction: While capsuloligamentous insufficiency is commonly emphasized, the potential contribution of intrinsic muscle stiffness, especially the adductor pollicis (AdP), is underrecognized in CMC-1 Osteoarthritis. The AdP has a large physiological cross-sectional area, generates substantial pinch torque, and remains continuously active in daily function; progressive fibrosis, shortening, increased resting tone, or contracture may narrow the first web space (1). These soft-tissue changes may also promote secondary deformities. AdP stiffness has recently been demonstrated quantitatively using shear wave elastography (SWE), showing increased muscle stiffness in patients with symptomatic CMC-1 osteoarthritis, suggesting a muscular contribution to imbalance (2). ESWT is widely used to reduce myofascial tightness, yet its role in modulating intrinsic hand muscle stiffness has not been explored. This case presents elastographic and clinical changes in AdP stiffness after ESWT in CMC-1 osteoarthritis.

Aim: The aim of this case report is to describe elastographic and clinical changes in AdP stiffness after ESWT in a patient with CMC-1 osteoarthritis, highlighting its potential relevance to thumb balance.

Material & Methods: A 54-year-old woman with stage III CMC-1 osteoarthritis of the right thumb (Eaton-Littler classification) and clinically evident AdP tightness underwent standardized assessment before and after treatment. AdP stiffness was quantified using shear wave elastography (SWE), with the probe positioned consistently over the oblique head of the muscle. Outcome measures included pain (VAS), first-web-space angle, pinch strength, Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire, Michigan Hand Outcomes Questionnaire (MHQ), SF-36 for quality of life, and the Roles-Maudsley score for treatment satisfaction. After baseline evaluation, ESWT (10 Hz, 2.4 bar, 1,600 pulses) was applied to the AdP once weekly for six weeks. Post-treatment clinical and elastographic assessments were repeated using identical protocols. **Results:** At baseline, AdP stiffness measured 2.0 m/s (11 kPa), with a VAS pain score of 6.5, pinch strength of 3.7 kg, and a DASH score of 53.3. After six weeks of ESWT, the patient reported complete pain relief and good treatment satisfaction (Roles-Maudsley score). AdP stiffness decreased to 1.2 m/s (8.0 kPa). Improvements were observed in pinch strength (4.5 kg), DASH score (20 points), as well as in SF-36 and MHQ subscores.

Conclusions: This case suggests that AdP stiffness may be a modifiable soft-tissue factor influencing thumb balance in CMC-1 osteoarthritis. ESWT resulted in quantified reductions in muscle stiffness and meaningful clinical improvement, highlighting the potential relevance of muscular contributions in symptomatic CMC-1 osteoarthritis.

A-0957 CURRENT RESULTS BASED ON A NEW ALGORITHM FOR DIAGNOSIS OF CARDIAC AMYLOIDOSIS IN PATIENTS WITH CARPAL TUNNEL SYNDROME

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Introduction: Bilateral carpal tunnel syndrome (BCTS) often precedes a diagnosis of cardiac amyloidosis (CA) by many years. Currently, the clinical impact of routine histopathological assessment of tissue specimens following carpal tunnel release (CTR) is not well established and controversial. We aim to create a multidisciplinary algorithm for screening and management of patients with BCTS for latent CA. We now have data for 150 patients who have undergone biopsy based on our algorithm.

Methods: A single-center, prospective study of men (age >50 years) and women (age >60 years) with BCTS undergoing CTR between 11/2022 to 11/2025 was performed. Intra-procedural biopsy and Congo Red staining were obtained in all enrollees. Biopsy-positive individuals underwent h-ATTR genetic testing, light chain amyloidosis (AL) screening and complete cardiac evaluation.

Results: 155 patients were included. Mean age was 70 years. 53 (34%) had positive biopsies. Among individuals with positive Congo Red Stains, 66% were males. Eight patients (15%) had PYP-positive scans but no cardiac symptoms. Four had normal troponins. All patients with PYP-positive scans were started on tafamidis, and those with positive biopsy but no evidence of CA will undergo yearly follow-up.

Discussion: Based on significant rate of positive biopsies some might ask if we should be performing a biopsy during every carpal tunnel procedure? There are some issues that arise with biopsies that deserve discussion. One major issue is overwhelming the cardiology clinic with referrals. At our institution patients who have a positive biopsy often wait 4-6 months to get into cardiology clinic. This leaves patients with high anxiety as they are told they may have a life-threatening diagnosis but cannot get in to see a cardiologist. Cost is another issue to consider. One might think it makes sense to treat all patients who have a positive biopsy even if they do not yet have cardiac amyloidosis. There are few side effects of these drugs and current therapies cannot reverse the disease only stop the progression. However, cost is not insignificant factors as tafamidis, one of the newest medical therapies for cardiac amyloidosis, was 225,000 dollars per patient annually when it was released. And finally how should we counsel these patients, given that the first presentation of cardiac amyloidosis may be sudden death? Should these people be airplane pilots, bus drivers, surgeons?

Conclusions: This study allows for a systematic algorithm to facilitate recognition of subclinical CA in patients undergoing routine CTR. Moreover, it provides clinicians with a framework for screening counseling and shared decision-making in early disease-modifying therapy. Further research on the cost-effectiveness of the algorithm and the psychologic impact of early diagnosis of extracardiac amyloidosis is warranted.

A-0958 COMPARISON OF CARPAL TUNNEL SYNDROME SEVERITY BETWEEN HANDS WITH AND WITHOUT A BIFID MEDIAN NERVE

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Introduction: Previous studies have suggested that the presence of a bifid median nerve (BMN) may be associated with the development or severity of carpal tunnel syndrome (CTS). However, the literature remains inconclusive, likely because most previous studies relied on inter-individual comparisons that are subject to confounding.

Aim: This study aimed to investigate the influence of BMN on CTS by performing intra-individual comparisons in patients with unilateral BMN.

Material & Methods: Between April 2015 and September 2025, ultrasonographic examinations were performed in 108 patients diagnosed with CTS at our institution. A BMN was identified in 18 patients, of whom 16 had unilateral BMN and were included in this study (ten men, six women; mean age 69.2 years). Clinical evaluation included the side of symptom onset and the side with more severe subjective symptoms. Nerve conduction studies assessed distal motor latency (DML), distal sensory latency (DSL), and compound muscle action potential (CMAP) amplitude. A between-hand difference >0.6 ms in DML, >0.4 ms in DSL, or >50% difference in CMAP amplitude, was considered indicative of a clinically meaningful asymmetry.

Results: In 14 of 16 patients, symptoms first appeared on the BMN side. At the time of examination, 13 of 16 reported more severe symptoms on the BMN side. Electrophysiological evaluation revealed that a between-hand difference in at least one parameter (DML, CMAP, or DSL) of the median nerve was observed in all 16 patients. 13 of them showed greater severity of at least one parameter of the median nerve in the BMN hand.

Conclusions: This within-patient comparative study demonstrated that symptoms and electrophysiological abnormalities of CTS were more likely to be severe on the BMN side. Unlike prior within-patient studies that used categorical grading systems, our quantitative approach detected clinically meaningful asymmetries. These findings suggest that BMN may contribute to the occurrence and progression of CTS.

A-0960 RELATIONSHIPS BETWEEN KINESIOPHOBIA, PAIN, FUNCTION, AND MUSCLE STRENGTH FOLLOWING DISTAL RADIUS FRACTURE

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Introduction: Kinesiophobia is an important psychological factor that negatively affects the recovery process in patients with distal radius fractures. Fear of movement in these patients can reduce adherence to rehabilitation protocols, increase pain perception, and prolong functional recovery.

Aim: This study aims to examine the relationships between kinesiophobia levels, pain, functional status, and muscle strength measurements during the rehabilitation process after distal radius fracture, and to evaluate the predictive role of pre-treatment muscle strength in the recovery process.

Material & Methods: A total of 34 patients were included in the study. The mean age of the participants was 47.82 ± 11.49 years. Of the patients, 32.4% were treated surgically with plate–screw fixation, while 67.6% received conservative treatment with a cast. The gender distribution was 70.6% female (n=24) and 29.4% male (n=10). The affected side was recorded as 44.1% right and 55.9% left. Kinesiophobia levels were assessed using the Tampa Scale of Kinesiophobia (TSK). Pain and functional limitations were evaluated using the pain and activities of daily living subscales of the Patient-Rated Wrist Evaluation (PRWE). Muscle strength assessments (flexion, extension, ulnar deviation, pronation) were performed using hand-held dynamometry (MicroFET 2; Hoggan Health Industries Inc, USA). Statistical analyses were conducted using SPSS version 19.0. Relationships between continuous variables were analyzed using Spearman correlation analysis, with a significance level set at $p < 0.05$.

Results: In this study, kinesiophobia was found to have a significant impact on both pain and activities of daily living. Positive correlations were observed between TSK scores and PRWE pain ($r = .381, p = .002$) as well as PRWE activities of daily living ($r = .484, p = .004$). The predictive role of baseline muscle strength in the recovery process was notable: baseline extensor strength ($r = .591, p = .001$) and ulnar deviation strength ($r = .592, p = .001$) were strong predictors of post-treatment changes in muscle strength. Furthermore, a very strong synergistic recovery relationship was observed between the flexion and pronation muscle groups in the post-treatment period ($r = .732, p = .000$). Overall, these findings indicate that kinesiophobia has a significant effect on clinical outcomes, and baseline muscle strength serves as a critical parameter in predicting rehabilitation success.

Conclusions: This study demonstrates that kinesiophobia has a significant impact on both pain and functional recovery during the rehabilitation process following distal radius fracture. The findings indicate that individuals with higher fear of movement experience higher post-treatment pain levels, and increased kinesiophobia is associated with greater limitations in activities of daily living. Furthermore, pre-treatment muscle strength serves as a strong predictor of post-treatment recovery. Considering both psychological factors (fear-avoidance behavior) and physical capacity in the planning of rehabilitation programs may substantially improve clinical outcomes.

A-0961 BALANCING MULTIDISCIPLINARY CARE BETWEEN REHABILITATION PHYSICIANS, HANDSURGEONS & HANDTHERAPISTS

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The main part of care for patients with problems of the hand and wrist is provided by handsurgeons and handtherapists. In the whitebook of FESSH on handsurgery it states: "The aim of handsurgery is to restore the function of the hand". But what if the function cannot be (completely) restored? Or what to do in the period that restoration is aimed for? Or what if the function is almost anatomically restored but limitations remain? How can a patient then find balance in life? As rehabilitation physicians we are used to unravel complex situations by using the ICF (International Classification of Functioning, Disability and Health). When is a rehabilitation physician useful? We will inform you about the ICF and the Dutch triage system that is nationally used to determine when a rehabilitation doctor is needed. We find that not all colleagues know what the added value can be of a rehabilitation physician. What better place to talk about it in the joint congress of the FESSH and the EFSHT? We are 3 rehabilitation physicians, all treating patients with complex hand and wrist problems, but all in a different working environment. In an academic hospital, in a rehabilitation centre and in a private clinic for rehabilitation. We want to inspire you by talking about our multidisciplinary collaborations. Between rehab physicians and handtherapists within our team, with hand surgeons, but also amongst ourselves. In some "handpatients" a more holistic approach is needed. And 'if you want to go fast go alone, if you want to go far, go together'. So this is an effort to find more sustainable partnerships between rehabilitation physicians, handsurgeons and therapists. True collaboration takes time. It requires understanding of each other's expertise, trusting one another's judgment, and recognizing that "they have to know you, to know what you are capable of." When this mutual respect and awareness are in place, we create a shared balance — between speed and sustainability, between independence and teamwork, and ultimately, between the needs of our patients and the capability of our professions.

A-0962 EXCISION OF A GIANT CELL TUMOR OF THE THUMB UNDER WALANT WITH INTRAOPERATIVE FUNCTIONAL ASSESSMENT

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Introduction: Giant cell tumors of the tendon sheath (GCTTS) are among the most common benign soft-tissue tumors of the hand. Surgical excision in the thumb is technically demanding due to limited space and close proximity to neurovascular structures. WALANT enables precise dissection and immediate functional control.

Aim: To present a case demonstrating the advantages of WALANT anesthesia for complete tumor excision while preserving interphalangeal (IP) joint function through active intraoperative movement testing.

Material & Methods: A 66-year-old male presented with a progressively enlarging mass of the left thumb. X-ray showed a soft-tissue prominence without osseous involvement. MRI revealed a lobulated tumor consistent with GCTTS adjacent to the flexor tendon sheath.

Surgery was performed under WALANT. A longitudinal incision was made along the radial thumb aspect. The digital nerves and vessels were identified and protected. The tumor was excised en bloc. WALANT enabled the patient to perform active IP flexion and extension intraoperatively to confirm tendon integrity and gliding.

Results: The tumor was completely excised without injury to the flexor system or neurovascular bundles. Intraoperative testing confirmed full active IP joint motion immediately after excision. The postoperative course was uneventful, with preserved sensibility and full ROM at follow-up. No early recurrence was observed.

Conclusions: WALANT provides excellent visualization, blood control, and real-time functional assessment during the excision of GCTTS in the thumb. This approach supports safe tumor removal while maximizing postoperative functional outcomes. WALANT should be considered a preferred technique in anatomically critical areas such as the thumb.

A-0963 THE IMPACT OF THERAPY-LED HAND CLINICS FOR THE TREATMENT OF ACUTE HAND TRAUMA: A CLUSTER NON-RANDOMISED CONTROLLED TRIAL

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Introduction: Hand and wrist injuries are common, with conservative management frequently the first line of treatment for many hand conditions.

Aim: To evaluate the effectiveness of therapy-led conservative management of acute hand injury in adults when compared to medical-led, care as usual.

Material & Methods: A cluster non-randomised trial was conducted across five hospital locations: four intervention and one control sites. Adults with acute hand injuries were included. Standardised outcome tools measuring function (QuickDASH), health-related quality of life (EQ-5D-5L), pain (VRS), and occupational value and competence (Occupational Self-Assessment- Short Form (OSA-SF)) were completed at baseline, 8-weeks, and 6-months.

Results: A total of 133 participants were recruited (intervention, n=67; control, n=66). Baseline demographics of participants were similar between groups. There was no statistically significant between-group differences in the primary outcome of function at 8 weeks (mean difference -0.05; 95% CI -6.41 to 6.3; p=0.99) or 6 months (mean difference -1.74; 95% CI -6.35 to 2.87; p=0.46), or in the secondary outcomes at each time point. However, the difference in scores across time was statistically significant for the primary outcome (p<0.001), and a number of secondary outcomes. The intervention group had a significantly lower number of onward referrals (p<0.001) and a reduced number of healthcare contacts.

Conclusions: Therapy-led hand therapy clinics were as effective as the care as usual pathway.

A-0964 EFFECTIVENESS OF OCCUPATIONAL THERAPY INTERVENTIONS AMONG ADULTS WITH CONSERVATIVELY MANAGED HAND CONDITIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Hand and wrist conditions are a common occurrence, with many treated by occupational therapists skilled in hand therapy provision.

Aim: This systematic review and meta-analysis examines the effectiveness of occupational therapy interventions for adults with conservatively managed conditions of the hand, wrist, and forearm.

Material & Methods: Searches were carried out in CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews, MEDLINE (OVID), EMBASE, and PubMed. Grey literature was searched for via Google Scholar. A systematic literature search was undertaken for randomised studies that examined occupational therapy interventions for treatment of hand, wrist, and forearm conditions. The primary outcome was function, with secondary outcomes of occupational performance, satisfaction with occupational performance, pain, and quality of life. Meta-analyses were completed, and GRADE was used to determine the certainty of evidence.

Results: 12 studies with 1,429 participants were identified. Interventions included combinations of occupation-based intervention, assistive device provision, education, orthosis provision, and exercise programmes for arthritis, carpal tunnel syndrome, and fracture and tendon injuries of the hand, wrist, and forearm. Occupational therapy resulted in an improvement of function (REM, SMD -0.27, 95% CI -0.00 – -0.53, I²=69%) (p=0.05), occupational performance (REM, SMD 0.83, 95% CI 1.61–0.06, I²=91%) (p=0.04), satisfaction with occupational performance (REM, SMD 0.74, 95% CI 1.42–0.05, I²=89%) (p=0.03), and pain reduction (FEM, MD -1.35, 95% CI -0.84 – -1.86, I²=0%) (p<0.00001).

Conclusions: Occupational therapy results in improvements across outcomes sought for those with conservatively managed hand conditions using robust methodology. Further high-quality research is recommended to determine the effects of interventions on specific upper limb conditions, inclusive of a broader range of clinical and patient reported outcome measures.

A-0965 OCCUPATIONAL THERAPY FOR ADULTS WITH ACUTE HAND CONDITIONS: A MIXED-METHODS FEASIBILITY STUDY

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Introduction: Hand injuries account for up to one-third of acute hospital presentations. Current guidelines and standards of care recommend patients with hand trauma are seen by hand therapists, typically occupational therapists.

Aims: This study explored the feasibility of implementing an occupational therapy-led hand therapy service for adults presenting acutely with a hand condition, using the RE-AIM framework.

Materials and Methods: Purposeful sampling was used to recruit adult participants (n=13) to the occupational therapy-led clinic. Outcome measures assessing function, quality of life, pain, and occupational value and competence were completed.

Results: Data analysis revealed improvements in outcomes post intervention and at six month follow up. Focus groups were completed with patients and Healthcare Professionals. Participants were receptive of therapy-led services, and barriers and facilitators to service integration were identified.

Conclusion: Occupational therapy-led clinics show potential in treating people with acute hand conditions from point of presentation to discharge, based on comprehensive RE-AIM evaluation.

A-0966 EVALUATING THE CLINICAL BENEFIT AND ACCEPTANCE OF A BESPOKE 3D-PRINTED SPLINT FOR THE TREATMENT OF Mallet Finger Injury: A Pilot Study in a Cohort of Patients

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Introduction: Mallet finger injuries due to forced flexion of the distal interphalangeal joint represent a common condition for hospital presentation. These injuries are primarily managed using generic splints. The gold standard of care is custom splinting by a specialized hand therapist. However, this is not widely available due to staffing constraints.

Aim: The aims of this study were to: (i) evaluate whether treating mallet finger injuries with a custom three-dimensional (3D)-printed splint is clinically beneficial, and (ii) assess patient and healthcare professional (HCP) acceptance and experience of bespoke 3D-printed mallet splints over generic splints.

Materials and Methods: Adult patients with closed mallet finger injury were recruited in this study, which was conducted across three Injury Units in the University of Limerick Hospital Group (ULHG). Each patient's injured finger was measured using calipers and subsequently fitted with a bespoke 3D-printed splint. Clinical benefit and acceptance of bespoke 3D-printed splints for the treatment of mallet finger injury was assessed.

Results: The results indicate that it is clinically advantageous to use a custom 3D-printed splint over a premolded generic splint. Out of the ten patients recruited, eight had successful outcomes based on the occupational therapist (OT) measurements using the Crawford classification scale. The results showed that 40% of patients scored excellent, 30% good, 30% fair, and 0% poor. In addition, in terms of patient and HCP acceptance of the splint, nine of the ten patients stated that they would use the 3D-printed custom splint again, if needed, in the future.

Conclusions: A high level of patient and HCP acceptance signifies the clinical advantage of using 3D-printed splints. This pilot study shows that advances in 3D printing could make custom splinting a viable option for use in personalized healthcare.

A-0967 SUTURE BUTTON FOR IRREDUCIBLE TRAUMATIC DISLOCATION OF THE THUMB CARPOMETACARPAL JOINT: TECHNICAL DESCRIPTION AND PRELIMINARY OUTCOMES

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Introduction: Irreducible traumatic dislocation of the first carpometacarpal joint is rare, most often resulting from axial compression trauma to the thumb. Traditional surgical options may require prolonged immobilization and risk postoperative stiffness. Button-based suspensionplasty offers a potentially less invasive method to restore alignment and function.

Aim: To present button suspensionplasty technique for stabilizing irreducible traumatic dislocation of the first carpometacarpal joint and to report preliminary clinical outcomes.

Material & Methods: Two patients with irreducible traumatic 1st CMC dislocation treated between in 2025 were included. Following unsuccessful closed reduction, closed reduction followed by suspensionplasty using a double-cortical button device. Radiographic alignment, intraoperative stability, postoperative mobilization, pain, pinch strength, and function were assessed at 3 and 6 months.

Results: A total of 2 patients (mean age 60 years) were evaluated. Correct reduction and stability were achieved in all cases. No major complications occurred, including implant failure or neurovascular injury. At 6 months, pain resolution and full range of motion were achieved in both patients, and all patients returned to their usual

Conclusions: We propose this technique as a reliable option for the management of irreducible traumatic dislocation of the 1st CMC joint, allowing for immediate joint reduction and the potential for early mobilization. These preliminary results are encouraging, although larger studies with longer follow-up are required to confirm long-term durability.

A-0968 BILATERAL MULTIPLE TRIGGER FINGERS IN A LONG-STANDING DIABETIC PATIENT: CASE REPORT

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Introduction: Trigger finger is a common condition. Simultaneous involvement of multiple fingers in both hands is rare, particularly in patients with long-standing diabetes. These cases may present diagnostic and therapeutic challenges. This report describes the management of bilateral, multiple-digit trigger fingers.

Case Report: A 39-year-old man with a 17-year history of diabetes presented with bilateral triggering affecting the 2nd, 3rd, 4th, and 5th fingers for 1.5 years. Examination showed the left hand had severe triggering in the fourth finger, moderate in the second and fifth fingers, and mild in the third finger. The right hand showed severe triggering in the second and fifth fingers, moderate in the fourth, and mild in the third. Initially, conservative management, including splinting and activity modification, was attempted, but symptoms persisted. Corticosteroid injections to all symptomatic fingers provided only temporary relief, with symptoms returning within three months. Due to persistent symptoms, an open A1 pulley release was performed under wide awake local anesthesia no tourniquet. The left fourth finger was treated first, followed by the right second and fifth fingers in the same session. The remaining symptomatic digits were treated later. Recovery was uneventful, except for slightly delayed wound healing, and all operated fingers became symptom-free.

Discussion: Bilateral, multi-digit trigger finger in diabetic patients is uncommon and associated with increased risks of recurrence and wound complications. A stepwise treatment approach—conservative management, injection therapy, and if necessary surgical release—was implemented in this context. Staged or simultaneous open A1 pulley release was observed to provide effective symptom resolution.

Conclusion: This case demonstrates the rare occurrence of bilateral multiple trigger fingers in a diabetic patient and describes favorable outcomes following staged and simultaneous open A1 pulley release after conservative measures and steroid injections were unsuccessful.

Keywords: Trigger finger, multipl digits, bilateral involvement, diabetes mellitus, A1 pulley release

A-0969 LARGE LIPOMA OF GUYON'S CANAL PRESENTING AS ULNAR NEUROPATHY: A CLINICAL CASE

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Introduction: Compression neuropathy of the ulnar nerve at Guyon's canal is most commonly attributed to traumatic, vascular, or idiopathic causes. Space-occupying lesions such as lipomas are rare and may present with non-specific symptoms, delaying diagnosis. We report an uncommon case of Guyon's canal syndrome caused by a large lipoma.

Case Presentation: A 71-year-old female presented with progressive paresthesia and weakness in the ulnar distribution of the right hand. Physical examination revealed sensory disturbance in the ulnar digits and intrinsic muscle weakness, with a prominent palpable mass in the hypothenar eminence. Ultrasonography suggested a well circumscribed fatty-tissue lesion within Guyon's canal. Due to persistent symptoms, the patient underwent ambulatory surgical exploration. Intraoperatively, a well-encapsulated 24x36x17mm mass compressing the ulnar nerve was identified and completely excised. Postoperative recovery was uneventful, with full resolution of symptoms.

Results: Histopathological examination confirmed the lesion as a benign lipoma. At follow-up, the patient remained asymptomatic with restored hand function.

Conclusion: Although rare, lipomas should be considered in the differential diagnosis of ulnar nerve compression at Guyon's canal. Early recognition and surgical excision offer excellent outcomes, as demonstrated in this case.

A-0970 COMPARATIVE COMPLICATIONS IN HAND SURGERY: WALANT VERSUS GENERAL, LOCAL, AND REGIONAL ANAESTHESIA

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Introduction and Aim: Wide-awake local anaesthesia no tourniquet (WALANT) has emerged over the past two decades as an important alternative to traditional anaesthetic techniques in hand surgery. By combining lidocaine with epinephrine, WALANT provides effective analgesia and vasoconstriction without the need for tourniquet or sedation, enabling a clear operative field while allowing patients to remain fully conscious and to participate in intraoperative functional testing. This approach not only avoids tourniquet-related pain and the systemic risks of general or regional anaesthesia, but also facilitates outpatient delivery, improves cost-effectiveness, and may broaden access for patients with significant comorbidities. Despite these advantages, anaesthetic practice remains heterogeneous, and concerns persist regarding the relative complication profile of WALANT compared with general, regional, or local anaesthesia with tourniquet. A systematic evaluation of safety outcomes, alongside secondary measures such as pain and patient satisfaction, is therefore warranted to inform clinical practice and guide the expanding role of WALANT in contemporary hand surgery.

Materials and Methods: This PROSPERO-registered systematic review was conducted in accordance with PRISMA guidelines. PubMed, Embase, Scopus, and Cochrane databases were searched for randomized controlled trials comparing WALANT to

other anaesthetic techniques in hand surgery. Eligible studies were limited to English-language reports that documented complications associated with WALANT hand surgery in adult populations. Outcomes assessed included complication rates and adverse effects, type of surgical procedure, local anaesthetic formulation, intra- and postoperative pain, and patient satisfaction. A random-effects model was used for meta-analysis to account for expected heterogeneity in patient populations, procedures, definitions of complications, and follow-up durations, with pooled estimates interpreted as average effects across diverse clinical settings.

Results: Meta-analysis of six randomized controlled trials including 433 patients found no significant difference in overall complication rates between WALANT and other anaesthetic techniques (RR 0.72, 95% CI 0.31–1.67; $p = 0.45$; $I^2 = 17\%$), with complications rare and no cases of digital ischaemia or necrosis reported. Subgroup analyses showed comparable complication rates across surgical procedures and age groups, with a non-significant trend toward fewer complications in the middle-aged cohort (40–55 years). Pain outcomes demonstrated similar or lower scores with WALANT, while patient satisfaction was consistently high, often exceeding that of comparator groups. These findings support the safety, acceptability, and applicability of WALANT across diverse hand surgery populations.

Conclusion: WALANT is a safe and well-tolerated anaesthetic technique for hand surgery, associated with low complication rates, high patient satisfaction, and practical advantages that enable on table assessments for patients. While current evidence supports its use as a viable alternative to general and regional anaesthesia, further large, high-quality trials are needed to strengthen the certainty of evidence and define its role across diverse surgical contexts.

A-0971 THE PERIOSTEAL MFC HAMMOCK FLAP FOR A PERIPROSTHETIC FRACTURE NON-UNION FOLLOWING TOTAL WRIST ARTHROPLASTY

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Introduction: The Motec total wrist arthroplasty (TWA) is increasingly used for wrist salvage. Periprosthetic fractures of the third metacarpal are among the most common complications requiring revision surgery. Up to date, there are no reported non-unions of such periprosthetic fractures. The periosteal flap of the medial femoral condyle (MFC) has been widely used for the treatment of challenging non-unions. The flap has a reliable pedicle based on the descending genicular artery and it can be wrapped around the site of non-unions, providing solid vascularization. We present a rare case of a periprosthetic fracture non-union after TWA and introduce the microvascular periosteal MFC "hammock".

Case Report: A 43-year-old patient presented with a right scaphoid pseudarthrosis and II° SNAC wrist. Due to osteonecrosis of the proximal scaphoid pole, an arthroscopic four-corner fusion was done. Non-union of the luno-capitate arthrodesis was subsequently observed as well as protruding screws with destruction of the lunate fossa. A Motec TWA was then performed. Early postoperative course was uneventful. However, five months after surgery, a periprosthetic fracture of the third metacarpal was observed with secondary dislocation and development of a non-union. Ten months later, a revision surgery was performed with non-union takedown and bone reconstruction.

For that purpose, a bridge plate was used in combination with a periosteal MFC flap wrapped around the palmar metacarpal (hammock flap) as well as additional cancellous MFC bone graft. Microvascular anastomoses were performed to the radial artery and cephalic vein.

Six months postoperatively the patient had an active range of wrist motion of pro-/supination 90/0/80° and extension/flexion 40/0/20°, full clenched wrist and an full opposition of the thumb. CT scan follow-up demonstrated dorsal bone consolidation with some residual palmar defects.

Conclusions: This case highlights the rare and difficult problem of a periprosthetic fracture non-union of the third metacarpal following Motec TWA. The microvascular periosteal MFC hammock flap is a versatile tool to add vascularization in these challenging bone reconstructions.

A-0972 RESTORING BALANCE IN THE RHEUMATOID AND ARTHRITIC HAND: FUNCTIONAL OUTCOMES OF A REDESIGNED SILICONE MCP ARTHROPLASTY

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Introduction: End-stage metacarpophalangeal (MCP) osteoarthritis and rheumatoid destruction disrupt the coordinated balance between flexion–extension, intrinsic–extrinsic muscle forces, and stable coronal and sagittal alignment. Pain, ulnar drift, and extensor lag generate asymmetric grip and impaired coordinated pinch. Silicone implants, acting as flexible spacers, remain widely used, but traditional designs carry risks of implant fracture, recurrent deformity, and limited active motion. A redesigned silicone MCP implant with a controlled central hinge and tapered stems was developed to enhance axial congruence, rotational stability, and soft-tissue balance, with the explicit goal of restoring multi-planar functional balance in the rheumatoid and degenerative hand.

Aim: To assess midterm clinical and radiographic outcomes of a redesigned silicone MCP arthroplasty for rheumatoid and post-traumatic osteoarthritis, focusing on restoration of balance across pain and function, coronal and sagittal alignment, strength symmetry, range of motion, and implant survivorship.

Material & Methods: An ambispective cohort of 14 consecutive patients (17 hands, 62 MCP joints) treated between 2018 and 2022 was analyzed, with ≥ 24 months of follow-up. Indications were painful, function-limiting MCP arthritis (15 rheumatoid, 2 post-traumatic) refractory to conservative treatment. All procedures were performed through a dorsal approach using the same technique and rehabilitation protocol. Collected variables included pain (VAS at rest/effort), MCP and total finger range of motion, ulnar deviation, extension lag, grip and key pinch strength (absolute and contralateral-normalized), QuickDASH and Michigan Hand Outcomes Questionnaire scores, and patient satisfaction (0–10). Radiographic evaluation assessed coronal and sagittal alignment, implant axis, subsidence, radiolucency, cysts, and implant integrity. Pre- vs postoperative comparisons used paired t-tests.

Results: Mean follow-up was 42 ± 9 months. Average age was 64 years; 12 patients were female. Most hands showed long-standing deformity and clinical instability. Pain–function balance improved significantly: VAS at rest decreased from 6.6 to 1.2 and with effort from 7.6 to 2.1, accompanied by marked improvements in QuickDASH and Michigan scores. MCP motion balance increased from 32° to 56°, with total finger range improving from 145° to 179°. Coronal alignment improved (mean ulnar deviation from 17° to 5°) and sagittal balance was restored (mean extension lag from 26° to 9°). Strength symmetry was recovered, with grip and key pinch reaching $\approx 95\%$ of the contralateral side. Patient satisfaction averaged 9/10. Radiographs showed stable alignment, only mild subsidence (≤ 2 mm), and no radiolucency, cysts, dislocation, or implant fracture. No early or late complications and no revisions occurred, yielding 100% implant survival. Conclusions: This redesigned silicone MCP arthroplasty restored a more physiological global balance of the hand—reducing pain, improving motion, correcting coronal and sagittal deformity, and re-establishing near-symmetric strength and

function. The absence of mechanical failures or revisions at midterm suggests that design features aimed at optimizing axial and rotational balance translate into stable clinical and radiographic outcomes. Longer-term and comparative studies are warranted to determine durability and broader applicability of this balanced MCP reconstruction.

A-0973 HAND AND WRIST INJURIES IN POLYTRAUMA: EARLY DIAGNOSTIC CHALLENGES IN A NATIONAL REGISTRY-BASED COHORT

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Introduction: Hand and wrist injuries represent an important but frequently under-recognised component of high-energy trauma. Although polytrauma patients routinely undergo whole-body CT, subtle carpal fractures and ligamentous lesions may remain unnoticed during the initial assessment. The launch of the Hungarian Experimental Polytrauma Registry (HEPR) provides a unique opportunity to characterise the incidence and diagnostic timing of these injuries on a national scale. **Aim:** To determine the prevalence, injury patterns, and rate of missed or delayed diagnoses of hand and wrist injuries in polytrauma patients recorded in HEPR.

Material & Methods: We performed a retrospective analysis of the first 201 patients enrolled in HEPR (launched January 2025). All patients met polytrauma criteria and underwent whole-body CT on admission. Hand and wrist injuries were categorized as fractures or purely ligamentous lesions (e.g., scapholunate dissociation, perilunate injuries). Timing of diagnosis, mechanism of injury, and demographic variables were evaluated.

Results: A total of 27 patients (13.4%) sustained hand or wrist fractures, and an additional 7 patients (3.5%) had isolated ligamentous injuries. Despite nearly 100% whole-body CT coverage, 44% of hand and wrist injuries were initially missed. Delayed diagnosis (>24 h) occurred in a substantial subset, while 8% of all injuries were identified more than one week after admission. Although the overall polytrauma cohort had a mean age of 54.5 years, hand and wrist injuries occurred predominantly in younger patients (mean age 38.5 years), typically following high-energy mechanisms such as road-traffic collisions or falls from height, and were rarely seen in the elderly.

Conclusions: Hand and wrist injuries in polytrauma are frequently underdiagnosed despite routine CT imaging. The high proportion of initially unrecognised and delayed diagnoses highlights the need for improved upper-extremity evaluation protocols and structured tertiary surveys. Targeted searching for hand injuries, especially in high-energy trauma, and the routine inclusion of dedicated hand radiographs during secondary and tertiary assessments are essential to reduce missed injuries. HEPR data underscore the diagnostic vulnerability of these lesions and their predominance in younger patients, emphasising the functional consequences of delayed identification in this population.

A-0974 OUR EARLY EXPERIENCE WITH UPPER LIMB NERVE TRANSFERS

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Introduction: Upper limb nerve injuries lead to major functional impairment and substantial socio-economic impact. This is particularly true for brachial plexus lesions and isolated mononeural injuries, all of them are more prevalent in the active adult population. In this context, nerve transfer surgery has become a reliable option for cases traditionally associated with poor outcomes, such as proximal nerve lesions, long-gap defects, or situations where the proximal nerve stump is unavailable.

Aim: This paper aims to present our experience with nerve transfers for upper limb reanimation in patients with brachial plexus paralysis and proximal ulnar nerve injuries.

Material & Methods: Four patients were treated at the Emergency Clinical Hospital “Sf. Ioan,” Bucharest. Two underwent spinal accessory to suprascapular nerve transfer combined with double fascicular transfer to the musculocutaneous nerve for extended upper brachial plexus palsy. Additionally, two patients with proximal ulnar nerve palsy were managed using anterior interosseous nerve transfer to the ulnar motor branch.

Results: The median patient age was 28 years, and the median delay from injury to surgery was 8.5 months. All patients recovered motor function to varying degrees (M1–M4), with the most notable improvements observed in shoulder stabilization and elbow flexion.

Conclusions: In our experience, nerve transfer procedures represent a reliable and effective strategy for restoring motor function in upper limb paralysis, underscoring once again the value and versatility of these techniques in complex nerve injuries.

A-0975 BILATERAL ABSENCE OF THE LUNATE: A CASE REPORT

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Introduction: The congenital absence of the lunate bone in adults is an extremely rare condition, with only a few case reports in the literature. Most cases are bilateral and not associated with syndromic features; however, some present alongside other carpal anomalies, such as an absent triquetrum or a hypoplastic scaphoid.

Aim: We aim to report a case of this rare entity with an updated literature review.

Material & Methods: We conducted a structured literature review to identify published articles on 'absent lunate and unilateral or bilateral' cases in humans. We searched Embase, Medline, PubMed, Google Scholar and Cochrane databases from 1946 until July 2025. Our search yielded six articles describing this unique pathology.

Results: We present a case report of a 51-year-old right-handed female office worker who was referred to our hospital in January 2024 with persistent bilateral wrist pain. Her medical history included chronic ulcerative colitis, and oestrogen hormone replacement therapy. She reported long-standing wrist pain and stiffness aggravated by computer use and physical exercises. Push-ups were increasingly difficult. A small lump had developed on the dorsal aspect of the right wrist. She denied any history of trauma. Plain radiographs were initially interpreted as SL-gap widening upon referral. Further CT scans revealed absence of lunate and a visibly deformed lunate fossa. On the examination, her active wrist range of motion was volar flexion 40°/40°, dorsal flexion 60°/55°, and supination 70°/85°, with full elbow and shoulder mobility. An electromyography (EMG) was conducted and showed no abnormalities. Surgical treatment option was discussed, but her symptoms sufficiently relieved following a course of night splinting and wrist stretching exercises.

Conclusions: The carpal ossification occurs in a predictable sequence, beginning with the capitate bone and ending with the pisiform bone. Abnormalities of the carpal bones can include alterations in number, shape, fusion, and abnormalities in size and maturation. These anomalies can be caused by primary factors associated with anatomical abnormalities, or by secondary factors such as post-traumatic conditions and degenerative diseases.

Due to the rarity of this entity, there are no general management recommendations and the options for partial fusion are very limited. Overall, diagnosis requires careful imaging and clinical correlation, and management should be individually tailored to the patient's symptoms.

A-0977 A RANDOMIZED CONTROLLED TRIAL COMPARING TWO MODERN WRIST ARTHROPLASTIES; 5-YEAR CLINICAL RESULTS

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Introduction: This is the first randomized controlled trial to investigate total wrist arthroplasties (TWAs).

Aim: Our aim was to compare the two best documented TWAs with regards to function and survival in patients below 70 years of age.

Material & Methods: 40 patients median age 59 (30 to 70) years with non-rheumatoid wrist arthritis eligible for wrist arthrodesis were randomized to either the ReMotion or Motec TWA. Patient rated wrist and hand evaluation (PRWHE), Quick disabilities of the arm, shoulder and hand (quick-DASH), pain (Numeric rating scale (NRS 0-100)), active range of wrist motion (AROM) (flexion + extension + ulnar and radial deviation (°)), grip strength (kgs), loosening and revision rates were compared. Both the patients and examining physiotherapists were blinded. T-tests and Chi-square tests were performed using SPSS version 30. Significance level was set at a p-value < 0.05.

Results: At five years follow-up AROM improved significantly more in the Motec (26° increase) than the Remotion group (2° loss). No other parameters differed significantly between the two implants.

PRWHE (58 vs 26 and 61 vs 29), quick-DASH (44 vs 28 and 47 vs 28), radial sided wrist pain at activity (NRS 69 vs 23 and 64 vs 18) and rest (NRS 34 vs 4 and 41 vs 11) and ulnar sided wrist pain at activity (NRS 52 vs 10 and 45 vs 8) and rest (NRS 25 vs 3 and 28 vs 6) improved significantly from preoperatively in the ReMotion and Motec group, respectively, similarly to the 2 year follow-up. AROM improved significantly in the Motec group only (99° vs 125°). Forearm rotation and grip strength did not change in either group.

At five years three Remotion implants had been revised to Motec due to carpal (two) and radial component loosening (one). No Motec implants loosened. One Motec was revised to arthrodesis due to fixed malposition, and four Motec MoM articulations were revised to metal-on-PEEK (MoPEEK) (three) and metal-on-polyethylene (MoP) (one) due to painful synovitis.

Conclusions: Function and pain scores improved significantly in both groups. Revision rates were high due to loosening for the Remotion and articular synovitis for the Motec. Alternative bearings (MoPEEK or MoP) were not available at study start and may have reduced the articulation revision rates for the Motec. Still, the majority of patients have relatively pain free functional wrist motion at follow-up, revised patients included. TWA surgery is complicated, necessitating intimate follow-up to identify problems as well as surgical competence to revise failed arthroplasties. This should be taken into account when offering arthroplasty surgery.

A-0978 PRESENTATION OF A NEW TEST FOR DETECTING OF UNSTABLE TFCC INJURY

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Introduction: Currently, there are no highly effective clinical tests for TFCC injuries. Physical examinations such as the ulnar fovea sign, the ulnocarpal stress test, and the ballottement test may aid in diagnosing TFCC injuries, but the limited by low specificity and sensitivity. Patients in whom existing tests do not indicate damage often report that wrist pain or symptoms occur only during complex wrist movements involving muscular tension or load. Therefore, we propose a

new, effective physical examination test, that replicates such complex movement.

Aim: Accuracy of the Twist Test for the diagnosis of unstable triangular fibrocartilage complex injury in the wrist.

Material & Methods: The study utilised a clinical dataset comprising 109, patients aged 13–67 years old. Patients sample consisted of 75 TFCC-positive and 34 TFCC-negative outcomes. The test was classified as positive if the patient was unable to do it due to wrist's pain or the test was painful, indicating a potential unstable TFCC injury. Arthroscopy was used to confirm TFCC injury, providing a definitive diagnosis through direct visualization of the intra-articular structures of the wrist. The sample size was deemed sufficient to estimate sensitivity and specificity with reasonable precision, based on guidelines for diagnostic test studies.

Results: For unstable injuries, sensitivity was 72.9% (95% CI, 59.0–83.4) with a specificity of 67.2% (95% CI, 54.7–77.7), PPV of 63.6% (95% CI, 50.4–75.1), and NPV of 75.9% (95% CI, 63.1–85.4). Among patients in the 25–35 years group within unstable injury strata, sensitivity peaked at 79.0% with specificity at 61.9%, for those above 35 years, sensitivity approximated 77.8% with specificity at 62.5%.

Conclusions: The advantages of the Twist Test are high specificity and strong sensitivity for unstable injuries ensure accurate confirmation of TFCC injuries, particularly in patients above 25 years, making it effective for detecting severe TFCC pathology. It is very helpful in making decision whether arthroscopic treatment is necessary.

A-0979 RESTORING BALANCE WITH TRANSPLANTED HANDS: CHALLENGES AND PROGRESS OVER THE FIRST YEAR

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Introduction: This case study details the post-transplant medical management and rehabilitation of a 29-year-old patient who underwent bilateral forearm transplants in November 2024. This ongoing process provides valuable insights from the perspectives of the managing surgeon, rehabilitation team, and the patient.

Aim: This presentation examines the complex, multidisciplinary challenges of restoring functional balance following bilateral forearm transplantation. Key questions include how early sensory recovery (or its absence) affects patient safety and independence, and how the sequential reinnervation of extrinsic hand muscles before intrinsic hand muscles shapes dexterity and hand function. We report the functional consequences of this initial muscular imbalance and the patient's adaptive strategies in the context of incomplete sensory protection will be examined.

Material & Methods: Comprehensive, longitudinal evaluation of the patient integrates both standardized clinical assessment and serial video documentation, capturing the evolution of functional capacity post-transplant. The structured rehabilitation protocol emphasizes customized splinting, early sensory reeducation, targeted neuromuscular stimulation, the introduction of adaptive devices, and task-based therapies to maximize independence. Simultaneously, the patient undergoes intensive medical monitoring, including regular graft biopsies and immunosuppressive management. Reflections from the patient regarding psychological and perceptual adaptation to the new limbs enrich the clinical narrative.

Results: To date, the patient demonstrates substantial and ongoing gains in upper limb function, exceeding pre-transplant abilities, though ultimate outcomes remain in progress. Interim functional achievements, persistent challenges, and emerging insights from this rare case will be discussed, offering novel perspectives on clinical management and future directions in limb transplantation.

Conclusions: Successful transplantation of both forearms 17-years after amputation requires the support for a balanced regeneration including the learning ability of the brain, the training of the neuromuscular and sensory organs using a team approach of patient, therapist, surgeon and immunologist.

A-0980 THE STIFF FOREARM HANDTHERAPEUTIC INTERVENTIONS FOR OPTIMAL FUNCTIONAL RECOVERY

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Introduction: Forearm rotation is a complex movement requiring coordinated interaction between multiple anatomical layers. Pathology at any layer can restrict rotation and cause dysfunction. Understanding layer-specific contributions and appropriate interventions is essential for effective rehabilitation.

Aim: To provide a systematic framework of therapeutic interventions organized by anatomical layer, clarifying relationships between pathology, functional contributions to rotation, and evidence-based treatments for forearm rotation disorders.

Material & Methods: Seven anatomical layers involved in forearm rotation were analyzed from superficial to deep. Each layer was examined for common pathologies, functional roles in rotation mechanics, and corresponding therapeutic interventions supported by current clinical evidence.

Results: The distinct layers were identified with specific therapeutic approaches: (1) Skin and subcutaneous with scar management for tissue mobility and sensory feedback (2) Superficial fascia with myofascial release for tissue gliding (3) Lymphatic system with manual drainage for lymphedema (4) Peripheral nerves with neurodynamic techniques and desensitization for neural tension and neuropathic pain (5) Muscle tissue with strength training and trigger point therapy for weakness in pronator/supinator muscles (6) Ligaments and joint capsules with mobilization and stretching for capsular stiffness and ligament injuries (7) Bone and joints with progressive loading and protective splinting for fractures and arthritis.

Conclusions: Effective forearm rotation rehabilitation requires layer-specific assessment and intervention. This anatomical framework supports precise clinical reasoning and optimized treatment selection, enabling clinicians to develop comprehensive plans that restore coordinated multi-layer function and improve patient outcomes.

A-0981 BLOOD FLOW RESTRICTION TRAINING IN HAND THERAPY: PRELIMINARY CASE REPORTS

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Introduction: Blood flow restriction (BFR) training has emerged as an effective rehabilitation modality in musculoskeletal therapy as a means to bridge the gap between restricted limb use during recovery and the associated loss of muscle strength. In contrast to conventional weight-bearing exercise, BFR enables strength improvements under low-load conditions, making it a valuable alternative for patients who cannot engage in high-intensity resistance training due to pain or insufficient structural stability. Despite its growing use in sports medicine, evidence regarding its application in hand therapy remains limited.

Aim: This presentation aims to show preliminary case reports on the feasibility, safety, and therapeutic effects of BFR training integrated in the rehabilitation of different hand injuries.

Material & Methods: Five patients with varying hand injuries underwent BFR training combined with conventional hand therapy. BFR was applied using pneumatic cuffs at prescribed occlusion pressures during low-load resistance exercises (30% of one repetition maximum (1RM), 30-15-15-15 repetitions with one minute break between each repetition). Outcomes assessed included muscle strength (1 RM), range of motion, level of pain, patients' adherence with the exercises, and functional hand scores at baseline and after 4 weeks. Adverse events such as increased pain were tracked.

Results: Until now, two patients have been recruited who tolerated the training well. They showed improvements in muscle strength and functional outcomes, alongside a reduction in pain, suggesting a positive impact on rehabilitation progress. No adverse events were reported. Three additional patients will be recruited in the near future.

Conclusions: The results of the first patients are promising, showing that BFR training seems feasible and safe in hand injured patients. They further support the potential of BFR training as an adjunctive modality in hand therapy to accelerate recovery and enhance functional gains. Further controlled studies are warranted to establish standardized protocols and confirm efficacy.

A-0982 WHAT'S STOPPING THE THUMB? A CASE OF IRREDUCIBLE VOLAR MCP DISLOCATION

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Introduction: Volar dislocations of the thumb metacarpophalangeal (MCP) joint are exceedingly rare and differ fundamentally from the more common dorsal dislocations. They are frequently associated with entrapment of soft tissues—including capsule, collateral ligaments or extensor tendons—that prevents successful closed reduction. Failure to recognize this pattern can delay appropriate surgical management, leading to chronic instability and functional impairment.

Aim: To describe the clinical presentation, surgical management and functional outcome of a volar MCP thumb dislocation, emphasizing key intraoperative findings that explain irreducibility and guide appropriate treatment.

Material & Methods: We report the case of a 75-year-old woman who sustained a volar MCP thumb dislocation after a fall. Clinical assessment revealed deformity, dorsal skin dimpling, swelling and severe restriction of motion. Standard anteroposterior and oblique radiographs confirmed volar dislocation. Closed reduction under local anesthesia was attempted but unsuccessful.

Results: Open reduction was performed under regional block through a dorsal zig-zag approach. Intraoperative findings included capsular interposition, displacement of EPL and EPB tendons, and a complete rupture of the ulnar collateral ligament (UCL). Soft-tissue structures were released and reduced. Capsular repair and UCL reinsertion were performed using a 1-mm JugglerKnot suture anchor placed in the proximal phalanx. Tendons were repositioned in their anatomical course. Stable reduction was obtained without the need for Kirschner-wire fixation. Postoperative immobilization was maintained for 3 weeks, followed by structured rehabilitation.

Postoperative evolution was favorable, with progressive gain in mobility and restoration of stability. At follow-up, the patient demonstrated minimal loss of motion compared with the contralateral side, absence of pain and full reintegration into daily activities without limitation. Grip strength was comparable to the opposite hand, and the DASH score improved significantly. The constellation of intraoperative findings—capsular incarceration, dorsal tendon displacement and complete UCL rupture—explained the impossibility of closed reduction and validated early surgical repair.

Conclusions: Volar MCP dislocation of the thumb is an uncommon injury pattern that typically requires open reduction due to soft-tissue interposition. Early diagnosis and surgical management enable restoration of joint congruity, stability and function. UCL assessment is essential, as complete lesions require repair to prevent chronic instability and loss of pinch strength. Awareness of this rare entity is crucial to avoid delayed treatment and ensure optimal long-term outcomes.

A-0983 BEYOND BORDERS, BEYOND NERVES: A RARE FLNH CASE FROM INDIA REQUIRING GLOBAL COLLABORATION

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Introduction: Fibroliponeurohamartoma (FLNH), also known as lipofibromatous hamartoma, is an uncommon benign tumor characterized by fibroadipose proliferation within peripheral nerves. It most frequently affects the median nerve and may be associated with macrodactyly (lipomatous macrodystrophia). The intraneural infiltration typical of FLNH poses major surgical challenges, as radical excision risks severe neurological deficit. Evidence for safe, effective management in extensive or atypical cases—particularly those treated in international or resource-limited settings—remains limited.

Aim: To present a rare pediatric case of combined median and ulnar nerve fibroliponeurohamartoma with associated macrodactyly, and to describe the outcomes of staged partial intraneural resection performed internationally, emphasizing surgical decision-making and functional results.

Materials & Methods: We report the case of a 12-year-old girl diagnosed in India with FLNH involving both the median and ulnar nerves in the hand, accompanied by macrodactyly. Diagnosis was based on clinical examination and radiographic findings demonstrating a volar soft-tissue mass and absence of distal phalanges of digits 3 and 4.

Surgical management consisted of staged partial intraneural resection of infiltrative fibroadipose tissue with meticulous preservation of functional fascicles. Complete excision was intentionally avoided due to high risk of disabling sensory and motor deficit. Intraoperative assessment focused on identifying fascicular planes, decompressing neural segments and resecting nonfunctional infiltrated tissue. Clinical follow-up assessed pain, swelling, sensory–motor function, and early recurrence.

Results: Surgery confirmed extensive fibroadipose proliferation infiltrating both median and ulnar nerve fascicles. Partial intraneural resection achieved effective decompression while maintaining fascicular continuity. Postoperative recovery was favorable, with improvement in pain and swelling and progressive functional gain. No significant neurological deficit was observed during follow-up. Early recurrence was not detected.

This case illustrates the marked heterogeneity of FLNH and the decision-making complexities associated with intraneural tumors in pediatric patients. The multidisciplinary and international nature of care further underscored the importance of individualized planning, conservative resection strategies, and preservation of neural function.

Conclusions: Fibroliponeurohamartoma is a rare benign lesion with high surgical complexity due to its intraneural infiltration. In selected patients, staged partial intraneural resection can relieve symptoms and preserve function while minimizing neurological risk. This case reinforces the importance of tailored surgical strategies, multidisciplinary collaboration and cautious avoidance of radical excision—particularly in extensive pediatric nerve hamartomas and in international care contexts where continuity of follow-up may be variable.

A-0984 MICROSURGICAL RECONSTRUCTIONS OF THE WARFARE INJURIES

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Introduction: Specifics of warfare involving modern military equipment determine the severity of injuries. Soft tissue warfare injuries were observed in 64.9–68.2%, of which large and massive soft tissue defects complicate 28.5–30.7%.

In 26% of cases, gunshot fractures are diagnosed, among which 76% have gunshot fractures with defects, a quarter of which have defects exceeding 6 cm.

Aim: To share our experience in ortho-plastic reconstruction of the warfare injuries with microsurgical flaps, and highlight the main problems and complications.

Materials and methods: We analysed treatment results of 18 patients (all males; mean age – 33.72 ± 6.28 years) with war-related injuries of the extremities to whom we performed ortho-plastic reconstructions with microsurgical flaps. Mean time from the injury to microsurgical reconstruction was 210.28 ± 191.14 days (from 64 to 930 days).

Results: We perform 9 free fibula flaps, 4 ALT flaps, 4 free latissimus dorsi flaps, and 1 radial artery flap to reconstruct the defects of the extremities (4 forearm, 1 shoulder, 1 elbow, 1 knee, 1 lower leg and 1 foot soft tissue defects, and 4 ulna, 2 radius, 1 mandibula, 1 wrist and 1 tibia bone defects). We have a 66.67% flap survival rate (12 out of 18). In 4 cases, we had persistent infection in the wound; in 1 case, the patient had 86% burns, and we could not identify the cause of flap failure; and in 2 cases, there was also a technical issue during the microsurgical phase. 7 patients (38.89%) were heavy smokers.

Discussion: Analyzing our results, and mainly reasons for the flap failure we find out that most common reason were persisting infection, still open wound and reconstruction in the early stage after the injury (average time 82 ± 13.95 days), we theorize that changes of the endothelium of the vessels due to significant energy of the injury can also impact the result of the microsurgical reconstruction. In 2 cases, the reason for the flap failure was the use of only one vein or veins of inappropriate diameters. We find that severe burn injuries can disrupt the clotting cascade and alter the microcirculation.

Conclusions: Warfare injuries of the extremities are polystructural, and in most cases, with tissue defects. In cases of significant tissue defects, it is more appropriate to postpone microsurgical reconstruction to a later stage. If the patient is suitable for microsurgery, proceed with it and preserve other reconstruction options in case the microsurgical flap fails.

A-0985 THE SPACE INVADERS: GIANT LIPOMAS OF THE FIRST WEB AND THENAR EMINENCE

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Introduction: Giant lipomas of the hand (>5 cm) are uncommon but clinically relevant due to the tight anatomical compartments of the first web space and thenar eminence. Although benign, their mass effect can lead to mechanical dysfunction or neurovascular compression, generating pain, paresthesias or weakness. Because vital structures traverse these narrow regions, pre-operative characterization and selection of the optimal surgical approach are essential to ensure safe excision and full functional recovery.

Aim: To describe two cases of giant lipomas in critical hand locations and evaluate the role of individualized pre-operative imaging and tailored surgical approaches in achieving complete excision without functional compromise.

Materials & Methods: Two women aged 70 and 79 years presented with slow-growing, painless masses of the left hand.

Case 1: A progressively enlarging first-web-space mass associated with dysesthesias and a positive Tinel sign at the thumb.

Case 2: A volar thenar mass without neurological symptoms.

Clinical assessment included inspection, palpation, neurovascular evaluation and functional testing. MRI was performed in both cases, confirming well-defined lipomatous lesions measuring $55 \times 43 \times 33$ mm (first web space) and $55 \times 42 \times 18$ mm (thenar eminence). Both lesions showed imaging features consistent with benign lipomas, with clear demarcation from adjacent structures.

Results: Surgical treatment was performed under regional anesthesia. A dorsal approach was selected for Case 1 to facilitate safe dissection around neurovascular bundles, while a volar thenar approach was preferred for Case 2 to optimize

exposure and preserve muscular insertions. Complete excision was achieved in both cases, followed by histopathological confirmation and standardized postoperative rehabilitation. Patients were monitored clinically to assess motion, strength, neurovascular integrity and recurrence.

Both surgeries proceeded uneventfully, with complete removal of the encapsulated fatty masses. Intraoperative dissection confirmed minimal adherence to neurovascular structures despite the confined anatomical spaces. Postoperative recovery was rapid: both patients regained full range of motion, maintained normal grip and pinch strength, and demonstrated intact distal neurovascular status. No recurrence, sensory deficit or residual pain was detected during follow-up. These findings underscore the importance of precise pre-operative imaging and the selection of individualized surgical approaches for safe removal of large lipomas in complex hand regions.

Conclusions: Giant lipomas of the first web space and thenar eminence, though benign, can cause significant functional or neurological symptoms due to limited compartmental space. MRI plays a critical role in defining lesion boundaries and guiding surgical planning. Complete excision through tailored approaches ensures excellent functional and aesthetic outcomes, with negligible recurrence risk. Early identification and multidisciplinary management enable safe treatment of these rare tumors in anatomically constrained areas of the hand.

A-0986 COMPARISON OF PROXIMAL INTERPHALANGEAL JOINT EXTENSOR LAG, RANGE OF MOTION, HAND STRENGTH, AND COST-EFFECTIVENESS IN CONSERVATIVE VS. OPERATIVE TREATMENT IN EXTRA-ARTICULAR P1 FRACTURES

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Introduction: Proximal phalanx (P1) fractures represent up to one-quarter of all hand fractures, most of which are extra-articular. Surgical fixation remains the standard treatment but frequently results in stiffness, adhesions, and delayed functional recovery despite adequate fracture healing. Conservative management offers an alternative approach that may preserve tendon gliding and joint motion, yet evidence directly comparing both strategies remains limited. To address this gap, a structured conservative rehabilitation protocol has been developed and has been applied in clinical practice since 2020.

Methods: This study is a retrospective cohort study of all patients who were conservatively treated with the new P1 fracture rehabilitation protocol between 2020 and mid-2025. Data collection was based on chart-review. The aim is to compare conservative and operative treatment outcomes for extra-articular P1 fractures, with primary focus on extensor lag at the PIP joint, and secondary outcomes including range of motion, patient satisfaction, therapy duration, number of sessions, and associated treatment costs.

Results: Thirty-one patients (mean age 46.4 ± 20.5 years; 42% female) were treated conservatively according to the protocol. Most were blue-collar workers (50%), followed by white-collar workers (20%), apprentices (10%), and retirees (20%). The small finger was affected in 74% of cases and the ring finger in 16%. All fractures were extra-articular, with 68% base, 26% shaft, and 6.0% subcapital fractures; 55% were transverse, 42% oblique, and one was a spiral fracture. Patients in the conservative group were treated in a midcarpal brace, typically immobilized in 70° MCP flexion (77.4%). Twin-taping (syndactyly) was applied in all cases to increase stability, with 41.9% receiving double syndactyly including the middle phalanx. Additional P1 bracing was used in 38.7% of patients with reduced or multifragmented fractures. At treatment completion (mean duration 15.6 ± 9.7 weeks, 9.2 ± 5.2 therapy sessions), 48.4% showed no PIP joint extension lag, while the remainder demonstrated a mean lag of 7.3 ± 4.3 degrees. Mean Total Active Motion (TAM) was $269.4^\circ \pm$

22.8°, corresponding to $95.0\% \pm 5.9\%$ of the contralateral hand. Grip strength averaged $95.9\% \pm 17.3\%$ of the unaffected side. Mean healthcare treatment cost was 2790 ± 1435 CHF. All patients reported satisfaction with treatment outcomes. Data collection for the surgically treated comparison group is currently being finalized, and the comparative results will be presented at the FESSH 2026 Congress.

Conclusion: Use of the conservative P1 fracture protocol has resulted in promising functional restoration, strong patient satisfaction, and a consistent return to pre-injury activity levels. The findings indicate that a structured conservative approach can restore motion and strength close to that of the contralateral hand while reducing the risks associated with surgical fixation. Based on these results, we anticipate that outcomes in the surgically treated group will be comparable or less favourable; however, this hypothesis remains to be confirmed by the ongoing comparative analysis

A-0988 THE EFFECT OF FOWLER TENOTOMY COMBINED WITH METACARPOPHALANGEAL ARTHRODESIS ON PIP AND DIP JOINT EXTENSION IN LATE ULNAR PALSY: A DYNAMIC ANGLE ANALYSIS IN A CADAVERIC MODEL

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Introduction: Ulnar nerve palsy leads to intrinsic muscle atrophy and fixed claw deformity, resulting in decreased grip strength and impaired fine motor coordination. In chronic cases, the effectiveness of tendon transfer procedures declines due to irreversible muscle degeneration. Metacarpophalangeal (MCP) arthrodesis provides stability for grasp but may be insufficient to restore distal interphalangeal (DIP) and proximal interphalangeal (PIP) extension. Fowler tenotomy, originally described to improve distal extension in mallet finger, may enhance the extensor mechanism when combined with MCP arthrodesis. This study investigates the combined biomechanical effect of these two procedures in a cadaveric model.

Aim: To evaluate the maximum PIP and DIP extension angles under varying tension loads applied to the extensor digitorum communis (EDC) tendon, and to assess the biomechanical effect of combining MCP arthrodesis with Fowler tenotomy in a cadaveric model.

Material & Methods: This experimental study was performed on six cadaveric upper limbs, including sixteen fingers. The EDC tendons were dissected dorsally, connected to a pulley system, and subjected to controlled traction using incremental loads from 50 g to 200 g to simulate dynamic extension. PIP and DIP extension angles were measured with a goniometer. Each specimen was evaluated under four sequential conditions:

1. Normal baseline,
2. MCP arthrodesis with K-wire fixation,
3. Combined MCP arthrodesis + Fowler tenotomy,
4. Fowler tenotomy alone (after K-wire removal).

Fowler tenotomy was performed as a partial central slip division, while MCP arthrodesis was fixed in a functional grasp position. Nonparametric analyses were used: differences among conditions were tested with the Friedman test ($p < 0.05$), and pairwise comparisons were performed with Wilcoxon tests using Holm correction.

Results: Significant differences were found among all four experimental conditions for both PIP and DIP extension. The Friedman test demonstrated highly significant changes ($p < 0.001$) with strong effect sizes (Kendall's $W > 0.90$). Pairwise Wilcoxon analysis revealed that the combined MCP arthrodesis + Fowler tenotomy produced the greatest improvement in extension angles. Both MCP arthrodesis alone and Fowler tenotomy alone improved extension compared to the normal

condition, but the combined procedure showed the highest functional gain. Median extension values approached zero in the combined group (PIP $\approx -8^\circ$, DIP $\approx -10^\circ$), reflecting minimal extension lag and highly stable extension across increasing loads.

Conclusions: The combination of MCP arthrodesis and Fowler tenotomy significantly enhanced PIP and DIP extension in this cadaveric model. The synergistic effect of the two procedures provided superior biomechanical performance compared to either technique alone, maintaining stable extension even under higher traction loads. These findings suggest that Fowler tenotomy has a broader influence on the extensor mechanism than previously expected and may optimize finger extension when combined with MCP arthrodesis. The combined approach may represent a valuable alternative option for functional reconstruction in chronic ulnar nerve palsy.

A-0989 THE IMPORTANCE OF IDENTIFYING RED FLAGS IN WRIST-HAND PAIN: A SYSTEMATIC REVIEW

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Introduction: Although current guidelines outline signs and symptoms of specific wrist–hand disorders, they provide limited support for early recognition of serious conditions—so-called red flags (RFs)—by non-hand-specialists. No prior systematic review has synthesized these findings.

Aim: To identify, classify, and summarize clinical red flags reported in the literature that should prompt suspicion of serious wrist–hand pathology requiring referral.

Material & Methods: A systematic search of seven databases and grey literature was conducted from June 2024 to March 2025. Eligible studies included those reporting wrist–hand pain with or without comorbidities. Two reviewers independently performed screening, data extraction, and risk of bias assessment (Murad, Newcastle–Ottawa, AXIS tools). Reported RFs were categorized into seven etiological domains. Narrative synthesis and frequency analysis were conducted. **Results:** Of 129 included studies, most were case reports or case series. Red flags were associated with oncologic (32 studies, 25%), orthopedic (30, 23%), rheumatologic (22, 17%), infectious (15, 12%), vascular (12, 9%), neurologic (10, 8%), and other systemic disorders (8, 6%). Persistent pain, swelling, and limited range of motion were the most frequent symptoms. Clinical suspicion was heightened when these co-occurred with systemic signs, neurological deficits, vascular changes, or palpable masses. Red flags were more often recognized through patient history than physical examination. Overall methodological quality was low to moderate.

Conclusions: This is the first comprehensive synthesis of RFs associated with wrist–hand pain that may mimic benign musculoskeletal conditions but indicate serious pathology. Persistent pain combined with atypical swelling or restricted motion emerged as key non-specific warning signs across multiple pathologies. As most red flags were recognized through patient history rather than physical examination and given the scarcity of high-quality prospective studies, current evidence does not permit quantification of diagnostic accuracy or prognostic impact. Until such data is available, the safest strategy in first-contact settings remains a low threshold for referral.

This review also highlights the importance of interdisciplinary collaboration between first-contact clinicians — particularly physiotherapists, occupational therapists, nurses, general practitioners—and specialists to ensure timely identification and management of potentially serious wrist–hand conditions.

A-0990 A HIDDEN PERIPHERAL NERVE INJURY, CASE REPORT

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Introduction: the purpose of this case report is to raise awareness of the occurrence of anastomosis between peripheral nerves in the upper limb. The outcome of the restoration of the balance of the hand function of our patient is presented. **Material & Methods:** In March 2025, a grenade exploded next to our patient during military training. His face, both hands, left forearm, left thigh, and right leg were injured. Primary wound care was performed at the first attended Health Care unit. A foreign body (grenade fragment) was removed from the soft tissues of the distal third of the left forearm. The other injuries were superficial. 3 days after the injury, he was transmitted to our department. During hospitalization, his wounds healed uneventfully. Upon discharge from the hospital, we noticed a lack of active extension of the little finger of the left hand, which led us to suspect ulnar nerve neuropraxia. One month after the injury, he was examined for lower limb complaints and a foreign body was removed from the left thigh. At that time, we recommended physiotherapy (selective stimulation current) treatment due to the further detected ulnar nerve involvement. Over time, the symptoms of ulnar nerve loss increased and median nerve involvement emerged. ENoG and peripheral nerve US showed a complete lesion of the ulnar nerve at the distal forearm level and median nerve compression at the same level. We performed external neurolysis of the median nerve and reconstruction of the ulnar nerve with an autologous sural nerve graft.

Results: Two months after surgery, active abduction/adduction of the fingers was observed and Tinel's sign was positive 3 cm distal to the wound line.

Conclusions: The symptoms of ulnar nerve injury that gradually developed after an open injury and the newly detected median nerve injury are explained by the presence of anastomosis between the two nerves.

A-0991 ASSESSMENT OF SENSITIZATION, PAIN CONTRIBUTING FACTORS AND HEALTH STATUS IN WORK-RELATED THUMB PAIN AMONG PHYSIOTHERAPISTS. A CASE CONTROL STUDY

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Objective: Physiotherapists' work-related thumb pain (WRTP) is highly impairing the physiotherapists' working ability and hasn't yet been described in a biopsychosocial framework. This study aimed to investigate the relationship between WRTP and sensitization phenomena in the peripheral and central nervous systems. Moreover, this research assessed the impact of pain-influencing cognitive factors described in the literature, such as anxiety, depression, self-efficacy, kinesiophobia, and catastrophization. This research also aimed to define the participants' health status based on the biopsychosocial framework and the role of the autonomic nervous system alterations.

Methods: In this study, 44 physiotherapists and 44 physiotherapy students were assessed. Participants completed questionnaires on hand function, central sensitization, and pain-influencing factors. Examiners administered the ICF Generic Core Set (ICF-GCS), bedside quantitative sensory testing (bedside-QST), strength tests, and the vagus nerve neurodynamic test (VNNDT). All statistical tests were adjusted by age and other identified confounding factors.

Results: Physiotherapists presented sensitization involving mechanisms explained by spinal cord plasticity, without

features of supra-axial involvement. Physiotherapists reported significantly more self-efficacy than controls despite the pain-related impairments. The ICF-GCS identified a significant limitation in physiotherapists' ability to work, showing a reliable detection of WRTP. ICF-GCS defined the WRTP phenomenon discriminating it from pain-free students. The VNNDT detected long-term adaptations of the autonomic nervous system to WRTP compared to normative values and was not predictive of WRTP.

Conclusion: WRTP among physiotherapists is a multifactorial condition, involving sensitization processes like temporal summation that leads them to adopt coping strategies inadequate to overcome the pain mechanisms involved, and the derived disability.

Impact statement: These findings stress the necessity for targeted interventions and increased awareness among physiotherapists of the complex biopsychosocial aspects of WRTP to effectively impact work-related disability and overall occupational well-being.

A-0992 ASSOCIATION BETWEEN DIABETES IN FIRST-DEGREE RELATIVES AND THE RISK OF DEVELOPING HAND SURGICAL DIAGNOSES

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Objectives: Optimal hand function relies on a delicate balance between skeletal stability, neuromuscular control, and surrounding soft tissue structures. Diabetes mellitus (DM) disrupts metabolic homeostasis and has a strong genetic component. In addition, it is a well-known risk factor for several hand conditions as part of the Diabetic Hand. The aim of this study was to examine whether family history of DM in first-degree relatives (parents, siblings, or children) influences the risk of hand surgical diagnoses (Dupuytren's disease (DD), carpal tunnel syndrome (CTS), ulnar nerve entrapment (UNE), trigger finger (TF), and thumb base osteoarthritis (CMC-1 OA)), potentially reflecting an inherited predisposition that disturbs this balance.

Design: Retrospective cohort study.

Methods: The study included 30,446 individuals aged 45–73 recruited 1991–1996. Data was collected from the Malmö Diet and Cancer Study (MDCS), linked with the Swedish Multi-Generation Register (MGR) and the National Patient Register (NPR). Logistic regression analyses were performed, and models were adjusted for age, sex, body mass index (BMI), current smoking, and alcohol consumption.

Results: In total, 14% of the study population had at least one hand surgical diagnosis. CTS was the most common condition, affecting 1,436 (5%) of individuals, followed by CMC-1 OA, 1,620 (5%), and TF, 1,129 (4%). DD was observed in 663 (2%) participants, and UNE was present in 371 (1%) participants. Mean follow up time was 28 years. DM in the index individual and first-degree relatives (parent, sibling, and/or child) was associated with an increased risk of developing hand surgical diagnoses in unadjusted models. However, after adjusting for confounders, only DM in the index individual remained significantly associated with an increased risk. Exceptions included a notable association between having ≥ 1 sibling with DM and Dupuytren's disease (DD) risk and having ≥ 1 child with DM and carpal tunnel syndrome (CTS) risk.

Conclusion: DM in the index individual consistently increased the risk of several hand surgical diagnoses. Family history of DM did not significantly influence the risk after adjustment, except for a notable association between ≥ 1 sibling with DM and DD, and ≥ 1 child with DM and CTS. These findings suggest a possible genetic contribution that may influence

pathological tissue remodeling and disrupt normal functional of the hand. Future research should investigate whether inherited vulnerability interacts with biomechanical and neuromuscular systems to disrupt the equilibrium required for optimal hand function.

A-0994 THE IMPACT OF SOONG GRADING ON LONG-TERM FUNCTIONAL OUTCOMES FOLLOWING VOLAR LOCKING PLATE FIXATION OF DISTAL RADIUS FRACTURES: A CROSS-SECTIONAL STUDY

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Introduction: Distal radius fractures are the most common adult Orthopaedic fracture, accounting for 17.5% of UK trauma presentations. The Soong system grades volar plate prominence relative to the volar rim (0–2). However, no studies to date have compared consultant-agreed Soong grading with long-term functional outcomes.

Methods: A retrospective review was conducted of adults (≥ 18 years) who underwent volar plate fixation for distal radius fractures between 1 January 2018 and 1 December 2021. Exclusions included patients under 18, surgery outside the Trust, alternative fixation methods and polytrauma. Three upper limb consultants independently graded postoperative radiographs using the Soong system.

Results: 211 patients were identified; 173 met inclusion criteria. Interobserver reliability using Fleiss' kappa was 0.31, indicating "fair" agreement. Functional outcomes at 6.2 years post-operative follow-up were compared between agreed categories of Soong Groups 0 and 1+2. Mean PRWE scores were 3.27 and 25.53 respectively ($p < 0.001$), with a mean difference of 22.26 exceeding the MCID of 21.2, indicating clinically worse pain and function with higher Soong gradings at long-term follow-up. Mean QuickDASH scores were 2.14 and 7.64 ($p = 0.002$), though the difference was below the powered MCID. Mean BMHQ scores were 59.27 and 57.14 ($p = 0.013$); however, the study was underpowered to confirm clinical significance in this parameter.

Conclusions: Higher Soong grades are associated with persistent loss of wrist function and increased pain at six-year follow-up, independent of patient factors or complications. Interobserver agreement was only fair, suggesting a need to refine the Soong grading system to improve consistency and guide management.

A-0995 WHEN THE LUNATE BREAKS THE RULES: A FRESH LOOK AT KIENBÖCK'S DISEASE

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Introduction: Kienböck's disease is a rare, progressive osteonecrosis of the lunate that affects young adults and leads to pain, functional loss and carpal collapse. Its origin is multifactorial. Lichtman staging is essential for diagnosis and treatment planning. Although several conservative and surgical options exist, evidence is mostly derived from small, heterogeneous series. This study presents an updated single-centre case series and places its findings within the existing literature

Aim: Describe the demographic, clinical, radiological and functional characteristics of patients with Kienböck's disease in a tertiary hospital.

Material & Methods: We conducted a retrospective case series of six patients diagnosed with Kienböck's disease (2021–2025). Clinical records and imaging were reviewed, documenting demographics, occupational demands, hand dominance,

symptom onset and treatments. Radiological assessment included Lichtman staging, ulnar variance, lunate morphology and MRI features. Functional evaluation comprised wrist motion, grip strength, pain (EVA) and disability (QuickDASH) at diagnosis and at 3, 6, 9 and 12 months

Results: The mean age was 51.67 years (SD 9.56), with equal male–female distribution. All patients were right-hand dominant, and 50% performed manual labor. Symptom onset ranged from spontaneous or unremembered trauma in 83.3% of cases to previous trauma in 16.7%. The dominant hand was affected in 66.7%, with no bilateral involvement. Intermediate–advanced stages (III–IV) accounted for 67% of the cohort. The mean time from symptom onset to specialist assessment was 35 months (SD 16.93). Ulnar variance was negative in 50%, neutral in 33% and positive in 17%. All MRIs demonstrated bone edema, with Viegas types I and II equally represented and a pathological Stahl index in 83%.

At diagnosis, wrist flexion and extension in the affected hand measured 46.7° (SD 27.33) and 45.8° (SD 26.54), compared with 82.5° (SD 6.12) and 75.8° (SD 6.65) on the contralateral side. Radial and ulnar deviation were 15° (SD 8.37) and 28.33° (SD 4.08) in the affected wrist, versus 30° for both in the healthy wrist. Grip strength was 16.8 kg (SD 4.02) in the affected hand and 24.3 kg (SD 3.83) in the contralateral one. Pain scores were 2 (SD 1.67) at rest and 6.17 (SD 1.60) during activity, with a QuickDASH score of 36.33 (SD 17).

At one-year follow-up, pain at rest was 2.40 (SD 1.81) and activity-related pain 6.20 (SD 2.17). Wrist flexion measured 46° (SD 30.5), extension 50° (SD 22.36), radial deviation 18° (SD 10.95) and ulnar deviation 28° (SD 4.47). Grip strength was 13.40 kg (SD 5.27), and the QuickDASH score was 41.40 (SD 22.19).

Conservative treatment before diagnosis was universal—immobilization (100%), physiotherapy (83%) and intra-articular injections (50%). One patient underwent surgery during follow-up. Statistical analysis was descriptive, with no significant associations between Lichtman stage and clinical or radiological variables.

Conclusions: Patients with Kienböck's disease presented after long delays, with two-thirds already in intermediate–advanced stages. Over one year, pain remained stable while motion, strength and QuickDASH scores declined slightly despite no radiological progression. Larger studies are needed to clarify prognostic factors and guide management.

A-0996 FROM PAIN TO POWER: FUNCTIONAL GAINS AFTER DUAL-MOBILITY TMC ARTHROPLASTY

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Introduction: Thumb carpometacarpal osteoarthritis is a prevalent degenerative condition responsible for pain, weakness and loss of hand function. Traditional surgical options remain effective but may involve variable stability and recovery times. Dual-mobility trapeziometacarpal (TMC) prostheses have emerged as a promising alternative designed to enhance joint stability, preserve motion and facilitate earlier functional return.

Aim: To describe the clinical, functional and patient-reported outcomes of dual-mobility TMC arthroplasty (Touch®) and to analyse variables associated with complications, functional recovery and satisfaction.

Materials & Methods: A retrospective observational study was conducted including all patients who underwent dual-mobility TMC arthroplasty in our centre. Variables included sex, occupation, hand dominance, E-L stage, radiographic parameters, preoperative Z-thumb and complications. Functional outcomes comprised grip strength, key pinch, Kapandji score and QuickDASH. Patient-reported outcomes included pain (EVA at rest and during activity) and satisfaction (0–10). Follow-up was performed at 3, 6, 9 and 12 months.

Results: Seventeen patients were included, most of them women (64.7%) and right-hand dominant, with a mean age of 60 years (SD 5.175). E-L staging was balanced (II n=9; III n=8). Mean return to basic activities was 3 weeks, and return to

work averaged 7.78 weeks (SD 2.32). Manual labour accounted for 47.1% of cases; 17.6% were retired and 35.3% performed office-based work. In 94% of patients, the trapezium measured 9–12 mm, and 17.6% presented preoperative Z-thumb. Overall satisfaction was high: at both 6 and 12 months, approximately 90% stated they would undergo surgery again and recommend it to others. Complications occurred in 35% of patients, including one case of dysesthesia, two EPB tendinopathies and three De Quervain cases, all of which resolved spontaneously. No reinterventions were required.

Pain at rest showed a tendency toward improvement ($p=0.011$), while pain during activity decreased significantly from 3 to 12 months ($p<0.001$). QuickDASH improved progressively across follow-up ($p=0.001$). Key pinch strength improved significantly ($p=0.004$), as did grip strength ($p<0.001$) and Kapandji scores ($p=0.004$).

Comparative analyses revealed a significant association between preoperative Z-thumb and worse outcomes: at 12 months, activity-related EVA was higher in patients with Z-thumb (4.50) versus those without (0.89) ($p=0.05$), and QuickDASH was similarly worse (68.15 vs 12.57, $p=0.03$).

E-L stage III showed a higher complication rate compared with stage II (83.3% vs 16.7%, $p=0.021$). Trends were also observed for worse QuickDASH at 12 months (E-L II: 10.3 vs E-L III: 37.5; $p=0.06$), higher contralateral key pinch at 6 months (E-L II 2.3 vs E-L III: 3.6; $p=0.027$) and 12 months (E-L II 2.5 vs E-L III: 4.0; $p=0.07$), and slightly lower satisfaction at 6 months (E-L II: 9.6 vs 8.5; $p=0.04$) and 12 months (9.7 vs 8.6; $p=0.05$). Sex and occupation showed no significant associations with outcomes.

Conclusions: Dual-mobility TMC arthroplasty yielded significant improvements in pain, strength, function and high satisfaction at one year. E-L stage III showed a higher complication rate and trends toward poorer functional outcomes, while sex and occupation had no impact. Preoperative Z-thumb was associated with worse pain and QuickDASH scores. Overall, the procedure was safe, effective and predictable

A-0997 LONG-TERM EFFECTS OF NEUROMUSCULAR EXERCISE THERAPY AND THE NEED FOR SURGICAL CONVERSION IN WRIST OSTEOARTHRITIS: 24-MONTH RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

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Introduction: Wrist osteoarthritis can cause persistent pain, reduced joint mobility, and difficulty performing daily activities, negatively impacting quality of life. Osteoarthritis management typically follows a patient-centred, stepwise approach, starting with patient education and exercise therapy, and progressing to surgery only if conservative treatment fails. However, unlike osteoarthritis of the knee, hip, and hand, wrist OA is relatively uncommon and has received far less attention regarding first-line management strategies, particularly education and exercise-based interventions.

Aim: This randomized controlled trial aimed to evaluate the long-term effects of neuromuscular exercise therapy, designed to improve joint strength and movement control, compared with range-of-motion exercises in individuals with wrist osteoarthritis, including the need for surgical conversion over 24 months.

Material & Methods: Forty-eight participants with symptomatic wrist osteoarthritis were randomly assigned to a 12-week self-management program. Participants received either a neuromuscular exercise therapy program (intervention group) or a program focused solely on range-of-motion exercises (control group). The primary outcome was the Patient-Rated Wrist Evaluation (PRWE) questionnaire, and secondary outcomes included grip strength, the Disabilities of the

Arm, Shoulder, and Hand (DASH) questionnaire, pain ratings, and overall patient-rated improvement. Outcomes were assessed at baseline, 6 months, and 12 months, and surgical conversion was recorded from medical records at 24 months. Results: No statistically significant between-group differences were observed for the PRWE questionnaire or any secondary outcomes at 6 or 12 months. The calculated effect sizes for PRWE were 0.018 at 6 months and 0.0073 at 12 months, indicating very small effects and supporting the lack of clinically meaningful differences between the groups. Similarly, surgical conversion rates at 24 months did not differ significantly between the groups, although rates were relatively low in both the intervention group (21%) and the control group (17%).

Conclusions: We found no clinically meaningful differences between the neuromuscular exercise therapy program and range-of-motion training in the treatment of wrist osteoarthritis at 6 and 12 months. Nevertheless, few participants in either group required surgery at 24 months, indicating that both exercise programs may contribute to symptom management over time. Further studies are warranted to refine and evaluate exercise-based interventions for the long-term management of wrist osteoarthritis.

A-0998 WHEN 'ACCEPTABLE' ISN'T ENOUGH: FUNCTIONAL OUTCOMES AFTER CORRECTIVE OSTEOTOMY FOR SUBTLE MALUNION OF THE DISTAL RADIUS

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Introduction: Malunion of a distal radius fracture may lead to persistent pain and functional limitation. Traditionally, the indication for corrective osteotomy is based on two-dimensional radiographic criteria. However, a subset of patients with radiographically subtle malunions—defined as cases in which all radiographic parameters fall within the acceptable limits outlined by current guidelines—may still experience significant symptoms that impair activities of daily living or occupational performance. Notably, rotational deformities are typically not evaluated, despite their potential clinical relevance

Aim: The objective of this retrospective cohort study was to evaluate the clinical outcomes of corrective osteotomy using a three-dimensional printed patient-specific implant in patients with a minimal malunion of the distal radius.

Material & Methods: This study is a retrospective cohort analysis of all consecutive adult patients who underwent corrective osteotomy for a minimal malunion following a DRF. All patients underwent corrective osteotomy using a 3D-printed patient-specific implant (PSI) between January 2020 and June 2024. Surgical outcomes were assessed using patient-reported outcome measures, including the Patient-Rated Wrist/Hand Evaluation (PRWHE), as well as clinical evaluation of distal radioulnar joint (DRUJ) stability.

Results: Fourteen patients were included. The PRWHE improved from 72 (IQR 56, 81) to 35 (IQR 8, 57) $p = 0.004$ after a follow up of 11 months (IQR 10, 13). Preoperatively, 11 patients had DRUJ instability. Postoperatively, only one patient exhibited asymptomatic DRUJ instability. No postoperative complications were observed.

Conclusions: Patients with subtle malunions of the distal radius may benefit from corrective osteotomy. Standard guideline parameters may not be sufficient to identify all patients who could benefit from surgical intervention. Moreover, DRUJ instability following a distal radius fracture should be considered a manifestation of malunion until proven otherwise.

A-0999 BALANCING WRIST PAIN IN ASSOCIATED TENOSYNOVITIS: A CASE REPORT

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Introduction: Wrist's first extensor compartment tenosynovitis represents a relatively common condition, often associated with carpal tunnel syndrome and trigger finger. However, one tenosynovitis might not come alone. We present a rare case of associated De Quervain syndrome and extensor carpi ulnaris tenosynovitis in a 56-year-old woman who was looking for wrist pain management.

Aim: The purpose of this presentation is to draw attention regarding the underdiagnosed coexistence of tenosynovitis within the wrist.

Material & Methods: Data was collected retrospectively from the hospital's archive, with patient's informed consent. A 56-year-old woman with chronic wrist pain was evaluated and operated for De Quervain syndrome and extensor carpi ulnaris tenosynovitis, according to the protocol. The follow-up period included 1, 2, 4, 12, 36 weeks after the surgery.

Results: The patient was successfully treated with retinaculum release of the first and sixth dorsal compartment, mentioning pain relief the next day, with decreasing VAS score. She could return to work within one month after sustained kinesitherapy for two weeks.

Conclusions: Balance might represent the key in dealing with complex wrist pain syndrome without an apparent underlying cause. Therefore, a better knowledge of the mechanisms, clinical symptoms, imagistic and management options could improve the outcome and wellbeing of patients with multiple tenosynovitis.

A-1000 FINDING BALANCE IN THE MANAGEMENT OF DOMESTIC ANIMAL BITES TO THE HAND

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Introduction: A common presentation at the emergency department, domestic animal bites are often treated successfully with wound care management at home. However, there is a small number of neglected cases reaching a doctor a few days later, with infected wounds, associating complications.

Aim: This paper draws attention regarding the complex management of complicated animal bites wounds in a multidisciplinary team.

Material & Methods: Data was collected and analyzed retrospectively from the hospital's archive, with patients' informed consent. We present the evolution of three patients diagnosed with infected wounds after contact with their pets. The subjects are two middle age females and one man, bitten by their own dogs and cats, referring to the emergency room few days after the incident. Furthermore, one of them has type 2 diabetes mellitus, with adequate glycemic control. Bacterial wound cultures were taken in the admission day, with results after 5-7 days. Patients were followed up for 1, 2, 4 and 8 weeks.

Results: The evolution of the wounds was favorable, with complete remission of the inflammation in 6 days. The mean number of hospital days was 4. Moreover, two bacterial wound cultures were negative and one positive for methicillin-

sensitive *Staphylococcus aureus*. Intravenous antibiotic therapy (association of two antibiotics) and nonsteroidal anti-inflammatory drugs were administered for 3-5 days, continued with oral medication at home. Despite a successful functional and esthetic result postoperatively, one patient required additional surgery because of poor compliance to the initial treatment.

Conclusions: Animal bites should be evaluated in the first 24 hours by a qualified personnel in order to establish the potential risks and the correct management. Regaining balance in neglected wounds might be tricky, often leading to infection which, left untreated, might easily spread to tendon, joint and bone. Patients compliance is of utmost importance, hence a good doctor-patient communication could improve the outcome.

A-1001 THE EFFECT OF METACARPOPHALANGEAL JOINT HYPEREXTENSION DEFORMITY ON ARTHROPLASTY FOR THUMB CARPOMETACARPAL JOINT OSTEOARTHRITIS

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Introduction: There is no consensus regarding the treatment indications for metacarpophalangeal (MP) joint hyperextension deformity with thumb carpometacarpal (CM) osteoarthritis. We primarily perform a modified ligament reconstruction and tendon interposition (LRTI) technique using the palmaris longus tendon for thumb CM joint osteoarthritis. When passive MP joint extension exceeds 40 degrees, we consider simultaneous MP joint intervention.

Aim: The aim of this study is to evaluate the impact of MP joint hyperextension deformity on postoperative outcomes following thumb CM joint arthroplasty and to assess the effectiveness of interventions for MP joint hyperextension deformity.

Material & Methods: This study included 73 thumbs in 71 patients who underwent arthroplasty for thumb CM joint osteoarthritis and were evaluated preoperatively and at 1 year postoperatively. Among the 58 thumbs without MP joint procedures, we investigated changes in MP joint hyperextension angle after CM joint arthroplasty and the association between preoperative MP joint hyperextension angle and postoperative outcome. For the 37 thumbs with a preoperative MP joint hyperextension angle of 30 degrees or more, we compared postoperative outcomes among those treated without MP intervention (n=22), with capsulodesis (n=10), and with arthrodesis (n=5).

Results: In thumbs with a preoperative MP joint hyperextension angle ≥ 30 degrees, the angle significantly decreased from 39.9 to 27.0 degrees following CM joint arthroplasty alone. Comparing thumbs with a preoperative MP hyperextension angle < 30 degrees (n=36) and ≥ 30 degrees (n=22), there were no differences in postoperative thumb range of motion, grip strength, pinch strength, pain VAS, or DASH score. Residual postoperative MP joint hyperextension deformity showed a weak positive correlation with pain VAS during use ($r=0.28$, $p=0.04$). Among cases with preoperative MP joint hyperextension ≥ 30 degrees, capsulodesis provided only a partial hyperextension-limiting effect, resulting in postoperative outcomes similar to those without MP intervention. MP joint arthrodesis provided a strong hyperextension-limiting effect but resulted in reduced overall thumb range of motion and higher postoperative DASH scores.

Conclusions: MP joint hyperextension deformity exceeding 30 degrees improves to some extent with CM arthroplasty alone, although residual deformity commonly persists postoperatively. The preoperative MP joint hyperextension angle does not adversely affect postoperative outcomes. Selection of primary intervention for severe MP joint hyperextension deformity should be based on a thorough understanding of the characteristics of each procedure.

A-1002 MAPPING THE RISK OF CRPS AFTER UPPER-LIMB SURGERY: A SYSTEMATIC REVIEW OF TOURNIQUET TIME AND ANAESTHESIA CHOICE

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Introduction: Complex Regional Pain Syndrome (CRPS) can be a challenging condition following upper-limb surgery, often resulting in chronic pain and stiffness. While pneumatic tourniquets are commonly used in these procedures, we still need to clarify how tourniquet duration, anaesthesia techniques, and patient factors, such as age, interact. Gaining insights into these relationships is key to minimising the risk of postoperative CRPS and improving patient outcomes. Together, we can make a positive impact on recovery.

Aim: To determine whether tourniquet time, type of anaesthesia, surgical procedure, and patient age, influence the incidence of CRPS after upper-limb surgery.

Materials & Methods: A systematic search was conducted across PubMed, Embase, Cochrane Library, and Web of Science for studies published between 1990 and 2025. The focus was on research related to upper-limb surgery that documented tourniquet duration and postoperative complex regional pain syndrome (CRPS). This search identified two primary studies involving 601 participants and one systematic review that met the inclusion criteria. The variables extracted from these studies included tourniquet duration, anaesthesia technique, type of surgery, patient age, and diagnostic criteria for CRPS. Due to the heterogeneity of the studies and the limited number of comparable datasets, a narrative synthesis was performed in accordance with PRISMA guidelines.

Results: In Dupuytren's fasciectomy, tourniquet times were similar across anaesthesia groups (~79–83 min), yet CRPS incidence varied significantly: general anaesthesia and IVRA-lidocaine produced CRPS rates of 24–25% while axillary block and IVRA-clonidine reduced CRPS to 5–6%, indicating an anaesthesia-dependent effect rather than a time-dependent effect.

In carpal tunnel release (CTR), tourniquet duration differed by technique. Under general anaesthesia or axillary block, patients who developed CRPS had longer tourniquet times (≈ 20 min) than those without CRPS (~ 16 min; $p=0.025$). Conversely, in IVRA techniques, which used longer tourniquet times (~ 44 – 45 min), no association was found between tourniquet duration and CRPS. Across CTR studies, CRPS incidence ranged from 2% to 8.3%, with no independent relationship with age.

Conclusions: CRPS risk following upper-limb surgery is influenced by both the type of anaesthesia and the tourniquet duration, but the effect is procedure-specific. In Dupuytren's surgery, the choice of anaesthesia particularly axillary block or IVRA-clonidine is more important than tourniquet duration. In carpal tunnel release under general anaesthesia or axillary block, even modest increases in tourniquet time toward ~ 20 minutes appear to elevate CRPS risk. In contrast, more prolonged ischemia during IVRA shows no such effect. Tailoring the anaesthetic strategy and minimising tourniquet duration, where appropriate, may help reduce postoperative CRPS.

A-1003 UTILIZING LLMS IN HAND SURGERY FOR EXTRACTING SPECIALIZED MEDICAL INFORMATION FROM UNSTRUCTURED ELECTRONIC HEALTH RECORD TEXT

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Introduction: Extracting medical information from unstructured clinical texts across various electronic health records is a labor-intensive and time-consuming, yet potentially very valuable task for scientific research and daily clinical care. Recent advances in large language models (LLMs) provide new opportunities for this. An LLM is an artificial intelligence program, like ChatGPT, that is trained on vast amounts of data to recognize, analyse, predict and generate natural language text using written instructions. These models can be adapted and used to retrieve clinically relevant information from unstructured medical documentation.

Aim: To evaluate whether LLMs represent an accessible and effective approach for extracting hand surgery and hand therapy-specific medical information from unstructured text.

Material & Methods: We developed the Dutch Hand and Wrist (DHW) dataset, comprising 100 health records and 496 annotated observation reports from patients with hand and wrist conditions. We manually annotated structured information related to five predefined clinical objectives: the specific diagnosis, the affected hand, the treated hand, which surgical procedures were performed and which complications were recorded, if any. We fine-tuned LLMs on the manually annotated text examples and compared their performance with their zero-shot prompting counterparts, which use only general knowledge and the instructions in the given prompt. For each record, the LLM generated predictions for these objectives based on the unstructured clinical text from the reports. These LLM-derived outcomes were compared with manual expert annotation using the F1-score, which is the harmonic mean of sensitivity and precision and therefore reflects both how completely and accurately the model identifies the correct information. We conducted multiple analyses using different locally-run instruction-tuned LLMs to evaluate their performance on information extraction.

Results: We found that fine-tuned models performed markedly better than zero-shot prompting. The fine-tuned models achieved an F1-score 0.15-0.35 points higher than that of the zero-shot model. The fine-tuned Gemma 3 27B model often showed the best performance between the different models, yet not for every clinical objective. We also observed that providing annotators with a consistent annotation protocol improved model performance, with gains of 0.02-0.07 F1-points across several models. Notably, models adapted to the medical domain did not consistently outperform general models across all five clinical objectives.

Conclusions: We found that several models demonstrated effective performance in extracting hand and wrist disorder-specific medical data from unstructured text, although performance varied across clinical objectives and across models. These findings indicate that LLM-based tools may become useful adjuncts for supporting research in hand and wrist surgery, but their current performance does not yet justify replacing manual data extraction. Future research should consider using larger datasets with a broader range of entity types and examine the potential for standardizing clinical documentation formats to enable more reliable automated information extraction across healthcare institutions.

A-1004 THE EFFECT OF TASK-ORIENTED OCCUPATIONAL THERAPY INTERVENTION ON ACTIVITY PARTICIPATION AFTER ROTATOR CUFF SURGERY: A PRE- AND POST-INTERVENTION EVALUATION

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Introduction: Rotator cuff tears are among the most common causes of shoulder pain and functional limitation, leading to restrictions in activities such as grooming, dressing and reaching. Although arthroscopic repair is frequently preferred, conventional postoperative rehabilitation mainly targets biomechanical outcomes such as range of motion, muscle strength and pain. These measures may not fully reflect changes in occupational performance and participation in daily activities that are meaningful for the individual. Task-oriented occupational therapy, which is based on motor learning principles and focuses on client-selected, meaningful tasks, has been shown to improve both upper extremity function and activity participation. However, evidence on task-oriented occupational therapy after rotator cuff surgery is still limited. **Aim:** To investigate the effects of a task-oriented occupational therapy intervention on occupational performance, satisfaction and functional outcomes in individuals following rotator cuff repair, compared with conventional rehabilitation alone.

Material & Methods: This randomized controlled trial will include 62 participants aged 18–65 years who underwent arthroscopic rotator cuff repair at least 6 weeks prior to enrollment. Participants will be randomly allocated to an intervention group (conventional rehabilitation + task-oriented occupational therapy) or a control group (conventional rehabilitation only). The intervention group will receive a 10-week task-oriented program, twice weekly for 40 minutes, based on individually prioritized activities identified using the Canadian Occupational Performance Measure (COPM). Outcome measures include: COPM, Goal Attainment Scaling (GAS), Constant–Murley Score, Shoulder Pain and Disability Index (SPADI), Timed Functional Arm and Shoulder Test (TFAST), Rotator Cuff Quality of Life Scale (RC-QoLS) and a patient satisfaction questionnaire. Pre- and post-intervention assessments will be compared within and between groups using appropriate parametric tests ($p < 0.05$).

Results: Recruitment and data collection are currently ongoing. Pre- to post-treatment changes in occupational performance, satisfaction, goal attainment, functional scores, pain and quality of life will be analyzed and between-group differences will be presented.

Conclusions: It is expected that adding a task-oriented occupational therapy program to conventional rehabilitation after rotator cuff repair will lead to greater improvements in occupational performance, participation and patient satisfaction than conventional treatment alone. The findings are anticipated to support the integration of client-centered, occupation-based approaches into postoperative shoulder rehabilitation.

A-1005 DEVELOPMENT OF A PATIENT-CENTRED CORE OUTCOME SET FOR HAND FLEXOR TENDON INJURIES IN ADULTS

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Introduction: Flexor tendon injuries (FTI) make up 15–20% of all hand trauma, with an incidence of 33.2 per 100,000 person-years, primarily affecting the working-age population. Around 25% of patients experience poor outcomes, which can lead to lifelong disability. Despite the need for high-quality evidence to guide treatment, there is no consensus on which outcomes should be measured. The heterogeneity of outcomes used across FTI studies has led to inconsistent reporting, hindering the ability to compare results effectively, and risks overlooking outcomes that are most important

to patients. A core outcome set (COS) is an agreed minimum set of outcomes that should be measured and reported in all clinical trials or research studies in a specific area of health, created with input from key stakeholders, including healthcare professionals and patients.

Aim: To develop a COS for FTI of the hand in adults.

Material & Methods: This was a mixed-methods three-phase study. In phase one, a longlist of potential outcome domains was identified through systematic review of published studies, and content analysis of qualitative interviews exploring patients' experiences of their injury, treatment and recovery. The longlist was entered into phase two, where stakeholders from two groups (patients; hand surgeons and therapists) prioritised outcome domains via a three-round online Delphi survey, then agreed on the final COS in a multi-stakeholder consensus meeting involving group discussion and individual voting.

Results: The systematic review of 91 studies identified 72 outcome domains, which were classified based on the World Health Organization International Classification of Functioning, Disability, and Health. Through the 19 patient interviews, 25 distinct outcome domains were identified. The outcomes from the systematic review and patient interviews were merged and deduplicated, resulting in a final longlist of 26 outcome domains, which formed the basis of the Delphi survey. 80 participants across the two stakeholder groups (20 patients, 36 hand surgeons and 24 hand therapists) took part in the Delphi survey. 19 outcome domains were rated as 'highly important' for the core outcome set. At the final consensus meeting, 18 participants (8 patients, 5 hand surgeons, 5 hand therapists) discussed and voted to put forward ten outcomes in the final COS. Based on the consensus meeting discussions and voting results, these were categorised into two tiers. Tier one consists of the mandatory outcomes that should be measured in all FTI studies: ability to perform tasks of daily living, pain, patient satisfaction, hand/wrist movement, grip strength, returning to preferred work or study, and impact of injury on mental health, emotional and social wellbeing. In tier two are additional outcomes that should be collected when relevant to the study question: numbness, dexterity, and complications.

Conclusions: This COS will standardise outcomes to be measured and reported in all clinical research on FTI in adults. While this establishes what to measure, further work (phase 3) will focus on how best to measure these outcomes. Adopting this patient-centred COS will improve the consistency and comparability of studies, support evidence synthesis, and strengthen the evidence base to improve management of these injuries.

A-1006 LIVED EXPERIENCE OF HAND FLEXOR TENDON INJURIES AND PATIENT PRIORITIES IN RECOVERY: A QUALITATIVE STUDY

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Introduction: Flexor tendon injuries (FTI) in the hand are common, accounting for 15-20% of all hand trauma. Patients require hospital admission, surgical repair by specialist hand surgeons and 12 weeks minimum of outpatient rehabilitation. Approximately 25% of patients have poor outcomes from rupture or scarring, requiring secondary interventions and leading to lifelong disability.

Despite the burden of this injury, there are no studies on the patient experience of recovering from FTI. Qualitative inquiry can shed light on the impact of injury, treatment experiences and priorities in recovery, which can improve healthcare professionals understanding of the injury, informing clinical practice and promoting patient-centred research.

Aim: To explore the lived experience and priorities in recovery that are important to patients recovering from these

injuries and whether this is influenced by personal circumstances, the nature of the injury, treatment or other factors. **Material & Methods:** This work builds upon the work of the HAFTI-COS project, which followed COMET methodology to develop a core outcome set (COS) for FTI in adults. One-to-one, semi-structured qualitative interviews were conducted with patients with a recent FTI (within the previous 12 months) with the primary objective of generating outcome domains towards the COS but also provided in-depth insight into their experience of injury, treatment and recovery. The interviews were conducted remotely by two experienced qualitative researchers not involved in the clinical care of patients, digitally audio-recorded and transcribed verbatim. In this secondary analysis, data were analysed using inductive thematic analysis following the steps of Braun & Clarke (2006).

Results: 19 interviews were conducted, each lasting 52 minutes on average (range 27 – 102 minutes). Participants were majority males (n=15) of working age, representing the injury population and the time from injury ranged between one and 12 months, spanning the full recovery experience. Approximately half of participants injured their dominant hand (n=10) and were in manual employment (n=10).

Early analysis has generated the following key themes: disruptions and limitations to daily life, uncertainty around treatment and recovery, impact on social relationships and mental health, and, patients' perception of and approach to their recovery. Findings point to clear opportunities to strengthen clinical communication strategies, particularly in the early stages of treatment, to support patients' understanding of their injury and optimise engagement throughout recovery. **Conclusions:** These findings offer valuable insights for educating clinicians about the lived experiences, expectations and needs of patients with flexor tendon injuries, helping to inform more responsive and patient-centred care.

A-1007 DO' S A AWARENESS CAMPAIGN WORK?

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Introduction: The rising trend in amputations and the increasing youth involvement in firework injuries reveals some alarming patterns, particularly the overwhelming majority of male victims—an average of 94% of those injured are men. This trend has remained consistent in recent years. In 66% of cases, the dominant hand was involved, and 75% of the victims required surgery. The Dutch hand surgery society together with the Dutch plastic surgery society and snapchat started an awareness campaign

Aim: to reduce blast injuries with an awareness campaign together with snapchat

Material & Methods: with the annual database trauma due to firework where registered nationally and the effect of the awareness campaign that reacted 8 million views was measured

Results: The Cobra firecracker has become a major culprit in these injuries, particularly in cases of severe trauma. Over the past five years, it has been responsible for a growing share of firework-related amputations, accounting for 51% of such cases on average. The percentage of injuries caused by the Cobra increased from 23% in the 2019-2020 New Year's period to 62% in 2023-2024, although it dropped back to 24% in the most recent year-end celebration. However, when accidents involving the Cobra occur, they tend to be very serious, with 79% of incidents resulting in amputations.

The most concerning aspect is that children and minors are the primary users of the Cobra firework. More than half (54%) of users are under 18, and 41% are younger than 16

Conclusions: Despite its risks, the Cobra is easily accessible through social media, making it increasingly popular as a form of entertainment, particularly among younger people. This accessibility, along with its potential to be used as a weapon, increases the likelihood of serious injuries and raises concerns about public safety. The widespread availability

of such dangerous, illegal fireworks significantly amplifies the risks they pose and the campaign hasn't changed the data. However a national ban for next year is achieved.

A-1008 USE OF CARBOXYMETHYLCELLULOSE AND POLYETHYLENE OXIDE IN EXTENSOR TENDON REVISION SURGERY: PRELIMINARY EXPERIENCE IN POST-TRAUMATIC TENOLYSIS AND SCAR REVISION

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Introduction: Carboxymethylcellulose (CMC) combined with polyethylene oxide (PEO) is an anti-adhesion system proven to reduce scar formation and improve tendon gliding in hand surgery, particularly for flexor tendons. Adhesions are a significant challenge in extensor tendon reconstruction, especially in secondary or tertiary post-traumatic surgeries where dense peritendinous fibrosis limits motion. These situations often require tenolysis, teno-arthrolysis, or combined scar revision. Recurrences of adhesions are common despite careful surgical technique and rehabilitation. Given the properties of CMC-PEO, its application in extensor tendon revision surgery may help maintain intraoperative gains, reduce postoperative stiffness, and improve functional recovery and patient-reported outcomes.

Aim: To evaluate the preliminary efficacy and safety of CMC combined with PEO in reducing postoperative adhesion formation in revision surgery of the extensor tendons.

Material & Methods: A preliminary observational study was conducted on patients undergoing secondary or tertiary revision of extensor tendons due to post-traumatic adhesions. Procedures included tenolysis, teno-arthrolysis, and scar revision aimed at restoring tendon excursion and improving motion. After each surgery, a standardized layer of CMC-PEO gel was applied to create a temporary anti-adhesion barrier over the treated tendon units. Postoperative assessment focused on:

- Recovery and maintenance of flexion-extension gains achieved intraoperatively throughout rehabilitation.
- Pain levels assessed using the Visual Analog Scale (VAS).
- Functional evaluation through the Quick Disabilities of the Arm, Shoulder, and Hand (qDASH) questionnaire.
- Potential complications or inflammatory reactions related to the gel.

All patients followed a structured rehabilitation protocol with early supervised mobilization.

Results: Preliminary findings suggest that the application of CMC-PEO may help preserve improvements in tendon gliding achieved during surgery. Patients demonstrated more stable maintenance of range of motion during follow-up compared to expectations for similar revision procedures. A reduction in pain levels (VAS) and improvement in functional scores (qDASH) were observed across the early cohort. No adverse reactions or complications attributed to the gel were recorded.

Conclusions: Although data collection is ongoing and full statistical analysis is pending, these early trends suggest that CMC-PEO may be a valuable adjunct in extensor tendon revision surgery, aiding in reducing postoperative adhesions and supporting functional recovery. Further patient enrollment and continued follow-up will clarify the indications, benefits, and limitations of its use in this context.

A-1009 PRIMARY HERMETIC WOUND CLOSURE AFTER SURGICAL MANAGEMENT OF HAND INFECTIONS IS NOT INFERIOR TO SECONDARY INTENTION HEALING IN TERMS OF TREATMENT FAILURE: A PROSPECTIVE PILOT STUDY
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Introduction: There is a persistent dogma in hand surgery suggesting that hermetic closure of infected wounds—particularly following animal bites—increases the risk of treatment failure. As a result, many centers traditionally manage infected wounds by allowing them to heal by secondary intention, either leaving them open or applying a non-hermetic closure. However, this approach may potentially prolong wound healing, increase pain and stiffness, and delay return to normal activities.

Aim: To evaluate the non-inferiority of hermetic (primary) wound closure compared to secondary intention healing (non-closure) in patients presenting with acute infected wounds of the hand.

Materials & Methods: In this prospective, non-inferiority pilot study, all consecutive patients with acute infected wounds of the hand were included. All patients received standardized surgical and medical management, including surgical debridement, irrigation with saline, a standard course of antibiotics, and daily wound care by a registered nurse.

For this pilot study, the first 30 patients were managed with open wound care (healing by secondary intention). In the second phase, the next 30 patients received primary hermetic wound closure after surgical treatment.

The primary outcome was treatment failure, defined as the need for surgical reoperation within 30 days.

Results: A total of 30 patients were included in each group. There were 2 reoperations in each group. There was no statistical difference between hermetic (primary) wound closure and secondary intention healing (non-closure), based on Fisher's exact test (6.7% vs 6.7%, $p = 1.00$). The main overall causes of infection were: (1) cat bites or scratches (30%), followed by direct wounds (28.3%) and dog bites (11.7%).

Conclusions: This prospective pilot non-inferiority study paves the way for a larger trial to further evaluate the potential benefits of primary hermetic closure compared with secondary intention healing in infected hand wounds. In this preliminary series, there was no difference between the two techniques in terms of reoperation rate for infection.

A-1011 IMPACT OF HAND TRAUMA ON PATIENTS QUALITY OF LIFE

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Introduction: Hand trauma might often impact patients significantly. Being diagnosed with either minor lesions treated in the emergency room or more complex ones which need hospitalization, the quality of life should be assessed from the beginning. Furthermore, patients often seek balance between work and personal life during the healing process.

Aim: This paper intends to emphasize the importance of teamwork in hand trauma management and its impact on patients quality of life.

Material & Methods: Data was collected retrospectively from the hospital's archive, with patient's informed consent, between 2024-2025. 126 patients met the inclusion criteria. Files with missing data were excluded. Patients were divided in two groups, as follows: Group A (ambulatory patients) and Group B (hospitalized patients). Data included patient demographics, traumatic mechanism, anatomical site, methods of treatment and surgical outcome. The impact of hand

trauma on patients quality of life was assessed using Romanian version of DASH score and Michigan Hand Outcomes Questionnaire. The follow-up period included 1,2,4,6,8,12 weeks postoperatively.

Results: The most frequently encountered mechanism of hand trauma in Group B was cut and avulsion lesions produced by manipulating a grinder, while in Group A, knife was often incriminated. One third of the cases occurred at workplace in Group B and 25% in Group B. The majority of subjects consists of males, aged 30-70 (mean age of 50). Furthermore, a quarter of the evaluated patients live in the rural area, performing labour work. In addition, fingers were the most affected region, especially the index finger, followed by the thumb. Furthermore, it has been noticed that the majority of soft tissue defects were covered with skin graft, while less than 25% needed local and regional flaps. Moreover, most of the replanted fingers survived. Nevertheless, regarding patient's quality of life, an elevated percentage of the subjects have been affected by the postoperative inactivity, missing work, found hand splinting for a prolonged period difficult, fact swchich interfered with their daily activities. The majority of subjects had optimal functional and aesthetic results. Conclusions: Hand trauma management might be challenging for both doctors and patients. Therefore, optimal communication improves the overall results. Raising awareness of the quality of life of persons with hand injury might brush up the current understanding of their needs. Furthermore, a teamwork approach might reach better outcomes.

A-1012 PATIENT-SPECIFIC CONGENITAL HAND SURGICAL TRAINING MODELS TO ENHANCE TRAINEE EXPOSURE AND PROCEDURAL PLANNING

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Introduction: Exposure to congenital hand surgery is limited in most training programmes due to the low incidence and heterogeneous presentation of conditions such as polydactyly, syndactyly, and atypical limb malformations. Operative techniques often involve complex flap design, three-dimensional spatial understanding, and meticulous soft tissue handling—skills that are difficult to teach without repeated case contact. Conventional methods of education using photographs, written descriptions, or occasional operative observation offer limited opportunity for rehearsal and fail to replicate the tactile and visual nuances required for planning and executing surgery in this niche area.

Aim: To describe the development and application of patient-specific congenital hand surgical training models that enable realistic preoperative simulation and enhance trainee exposure to uncommon congenital hand differences.

Material & Methods: Patient-specific anatomical models were created using a direct casting technique. A negative mould of the affected hand was produced intraoperatively or in clinic using skin-safe casting material. From this, a solid replica was generated to reproduce the patient's unique bony and soft-tissue contours. A silicone "skin" layer was subsequently applied over the replica to mimic pliable soft tissue, allowing trainees to practise incision placement, flap design, and tissue elevation. Each model could be physically handled and manipulated, enabling trainees to visualise deformity, plan operative approach, and simulate key procedural steps. Preoperative and postoperative clinical photographs accompanied each model to correlate deformity, planned reconstruction, and surgical outcome. A range of congenital conditions—including various presentations of polydactyly and syndactyly—were represented to reflect common operative scenarios. Results: The casting process produced highly realistic anatomical replicas that preserved individual variations in digit position, crease patterns, and web depth. The silicone layer facilitated flap marking, incision execution, and tissue handling with tactile feedback approximating live surgery. Trainees demonstrated increased engagement and confidence when discussing operative strategy and anticipating challenges after interacting with the models. Beyond training, the

technique proved valuable for archiving unusual presentations, creating durable physical records that support future teaching and comparison. The casting workflow was adaptable across deformity types and shows potential for extension beyond congenital hand surgery, including trauma, tumours, and complex reconstructive cases where advance planning and repeated rehearsal may improve operative proficiency.

A-1014 BILATERAL DYNAMIC CT FOR SCAPHOLUNATE INSTABILITY: TOWARD PERSONALIZED, PROTOCOL-STANDARDIZED KINEMATIC DIAGNOSIS

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Background: Dynamic CT imaging enables three-dimensional evaluation of wrist motion and is increasingly used for diagnosing scapholunate (SL) ligament injuries. However, variability in protocols across institutions restricts comparability and hinders standardization. An important consideration is whether to adopt unilateral or bilateral scanning, as unilateral approaches often rely on external reference datasets for diagnosis. This study evaluates whether contralateral referencing in bilateral dynamic CT scanning supports SL injury diagnosis by assessing (1) the influence of scan protocol variation on outcome measures; (2) similarity between wrists of healthy individuals and contralateral healthy wrists of patients; (3) wrist motion symmetry in healthy individuals; and (4) contralateral referencing in patients with a unilateral SL injury.

Methods: This retrospective multicenter study combined data from three prior studies at Radboud University Medical Center (RUMC) and Amsterdam University Medical Center (AUMC): cohort one included unilaterally scanned healthy volunteers (RUMC), cohort two involved bilaterally scanned healthy volunteers (AUMC), and cohort three consisted of patients with arthroscopically confirmed unilateral SL lesions (RUMC). A dynamic CT scan consists of a single static CT scan and multiple dynamic CT frames, acquired while the participant moves their wrists in radial-to-ulnar deviation (RUD) and flexion-extension (FE). At the RUMC, participants performed the movements freehandedly with their forearms were stabilized. At the AUMC, wrist motion was guided using a custom-made device. Outcome measures were the scapholunate distance (SLD) at five points on the SL joint surface, extracted automatically during both movements. To account for inter-individual differences in wrist position, all data were linearly interpolated relative to wrist position, transforming frame-based parameters into position-based parameters. For each parameter, the mean was calculated for every wrist position achieved by at least 70% of the wrists.

Results: (1) Across five SLD measurements and two movements, differences in scan protocols between RUMC and AUMC were most pronounced during RUD. For dorsal and volar measurements, mean absolute differences were 0.32 mm (range 0.17–0.38 mm) and 0.37 mm (range 0.22–0.45 mm), respectively.

(2) Across all measurements, the mean differences ranged from 0.04 mm – 0.20 mm with a maximum difference of 0.32 mm, indicating similar motion patterns between healthy volunteers and the contralateral wrists of patients.

(3) Across all measurements, the mean differences ranged from 0.03 mm – 0.16 mm with a maximum difference of 0.26 mm, indicating similar motion patterns between the dominant and non-dominant wrist of the same individual.

(4) In patients with complete SL lesions, mean differences in SLD ranged from 0.78–1.25 mm, with a maximum of 2.08 mm when comparing the injured wrist to the contralateral healthy side. Partial SL lesions showed smaller, localized asymmetries with mean differences ranged from 0.09–0.21 mm, with a maximum of 0.70 mm.

Conclusions: Contralateral referencing in bilateral dynamic CT scanning is both possible and justified for diagnosing unilateral SL injuries. This approach avoids the need for reference datasets and should therefore be considered.

A-1015 AT 25° TO SUCCESS: A NEW POST-SURGICAL RADIOGRAPHIC PERSPECTIVE

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Introduction: During the postoperative lateral radiographic controls, if a 25° profile is not performed, it seems that some screws could be in the joint. In case of doubt, a postoperative computed tomography should be added.

How can we easily obtain this profile projection reliably?

Aim: Evaluate the effectiveness of a 25° wedge designed and printed with 3D technology in obtaining an adequate radiographic profile in postoperative patients with distal radius fractures treated with a volar plate, aiming to detect intra-articular penetration of distal screws.

Material & Methods: Thirty-three patients with distal radius fractures treated with a volar plate were included. A 25° wedge was used to obtain postoperative lateral X-rays. The images were assessed by two orthopedic surgeons to determine the presence of intra-articular screws.

Results: The 25° wedge was employed in 100% of patients to obtain the X-rays. The use of the 25° wedge allowed for clear visualization of the radiocarpal joint in 93.9% of cases.

Conclusions: The 3D printed 25° wedge is an effective tool for obtaining adequate lateral X-rays in postoperative patients with distal radius fractures treated with a volar plate. This technique improves the detection of intra-articular screws, reducing the need for additional imaging such as CT scans. Routine use is recommended in the postoperative evaluation of these patients to ensure proper visualization of the screws and anticipate associated complications.

A-1016 ELECTRICAL BURN INJURIES OF THE HAND: FROM PEDICLED TO MICROSURGICAL FREE FLAPS

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Introduction: Electrical burns of the hand represent a severe form of high-energy trauma in which the external wound often underestimates the real extent of damage. Electric current can travel along tendon and neurovascular structures, causing muscle coagulation, vascular thrombosis and skeletal involvement. Tissue demarcation may evolve over hours or days, progressively revealing areas of necrosis. This injury pattern results in a complex reconstructive scenario. Surgeons must control infection, assess tissue viability and provide soft-tissue coverage to protect exposed tendons, joints and nerves. Failure to achieve early closure can lead to stiffness, scar contracture and long-term functional impairment. A careful balance between adequate debridement and preservation of viable tissues is essential, along with rapid initiation of physiotherapy to maintain motion. Multiple reconstructive strategies are described, from pedicled flaps to free-tissue transfer. Pedicled flaps offer reliable vascularity, reduced operative times and donor-site morbidity, making them suitable

for moderate defects. Free flaps, however, enable reconstruction of larger or composite losses, providing volume and allowing secondary tendon or nerve repair when needed. Despite the widespread use of both options, comparative outcome data within homogeneous patient groups are still limited. A clearer understanding of indications and results may help refine clinical decision-making in electrical hand trauma.

Aim: To present our 10-year experience in the management of electrical burn injuries of the hand, analysing indications and outcomes of pedicled versus microsurgical free flaps, and evaluating the benefits and limitations of each approach in terms of survival, complications, donor-site morbidity and functional recovery.

Material & Methods: A retrospective review was conducted including all patients treated for electrical hand burns from 2014 to 2024. Demographic data, mechanism of injury and extension of tissue loss were recorded. For each case, timing of surgical reconstruction, type of flap, need for secondary procedures, duration of hospitalization and rehabilitation were analysed. Functional outcome was assessed clinically and through grip strength, range of motion and patient-reported satisfaction at medium-term follow-up. Pedicled flaps included homodigital, heterodigital, radial, ulnar and posterior interosseous flaps, whereas free-flap reconstructions involved anterolateral-thigh (ALT), scapular and great-toe-to-thumb transfers. **Results:** Nineteen patients met inclusion criteria: 9 received soft-tissue reconstruction alone, 5 underwent pedicled flap coverage and 5 were treated with microsurgical free flaps. Pedicled flaps provided reliable coverage with excellent survival, rapid execution, low donor-site morbidity and satisfactory preservation of hand motion. They proved particularly effective in moderate-sized defects with preserved vascular supply. Microsurgical flaps were selected for extensive injuries with tendon, joint or bone exposure, or when soft tissue was insufficient for local transfer. Free flaps achieved stable coverage and restoration of volume, allowing tendon or nerve reconstruction where needed. No major complications or total flap losses were recorded.

Conclusions: Across the cohort, reconstructive success correlated strongly with timing of debridement, accuracy of viability assessment and early initiation of physiotherapy. Both pedicled and microsurgical strategies yielded good functional outcomes when appropriately tailored to lesion characteristics and patient condition. These results support a flexible algorithm in electrical hand trauma, where local flaps offer an excellent first-line option and microsurgical transfer remains decisive in complex or extensive defects.

A-1017 A MULTICENTRIC, EVALUATOR-BLINDED, RANDOMIZED EVALUATION OF CARBOXYMETHYLCELLULOSE AND POLYETHYLENE OXIDE ANTIADHESIVE GEL FOLLOWING REVISION SURGERY FOR PERSISTENT OR RECURRENT CARPAL TUNNEL SYNDROME

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Introduction: Persistent or recurrent carpal tunnel syndrome (rCTS) remains a difficult condition to manage surgically, mainly due to fibrosis and perineural adhesions compromising median nerve recovery. Traditional coverage techniques, such as the hypothenar fat pad flap, are effective but technically demanding and time-consuming. Bioresorbable antiadhesive agents like carboxymethylcellulose and polyethylene oxide (CMC-PEO) gel could offer an easier and potentially more efficient alternative to prevent postoperative adhesions. This multicentric randomized study aims to evaluate the effectiveness and safety of CMC-PEO gel compared with the hypothenar fat pad flap in revision surgery for persistent or recurrent rCTS. **Aim:** To demonstrate that carboxymethylcellulose and polyethylene oxide (CMC-PEO) antiadhesive gel reduces postoperative pain and complications, improves functional outcomes, and shortens surgical time compared to the hypothenar fat pad flap for median nerve coverage following revision surgery for persistent or recurrent carpal tunnel syndrome (rCTS).

Material & Methods: This multicentric, evaluator-blinded, randomized clinical trial involves 50 participants with recurrent or persistent rCTS. Randomization is 1:1 to receive either CMP-PEO (Group 1) or hypothenar fat pad flap coverage (Group 2) after revision surgery of neurolysis. Participants will be assessed at baseline, week 1, week 4 and week 12 postoperatively. Outcomes measures include Visual Analog Scale (VAS) for pain, Quick Disabilities of the Arm, Shoulder, and Hand score (Quick DASH) for hand function, DN4 score for neuropathic pain, electroneuromyography for nerve recovery and dynamometer testing for grip strength. Data will be collected and analysed by blinded evaluators.

Results: Preliminary analysis demonstrates significant improvements in the CMC-PEO group compared to the hypothenar fat pad flap group. CMC-PEO use resulted in greater reductions in pain (average -0.8 VAS points) and neuropathic symptoms (30% regression of DN4 scores). Functional recovery, as measured by the Quick DASH, improved by 18 points on average in the CMC-PEO group, compared to 10 points in the control group. Additionally, surgical time was reduced by an average of 15 minutes in the CMP-PEO group.

In conclusion CMP-PEO significantly reduced postoperative pain and neuropathic symptoms compared to the hypothenar fat pad flap. It demonstrated greater improvements in hand functionality, supporting its role in preventing adhesion-related impairments.

CMC-PEO represents a promising option for reducing complications and improving outcomes in revision surgery for rCTS.

Conclusions: This study underscores the potential of CMC-PEO as a safer, faster, and more effective alternative to traditional methods for managing persistent or recurrent rCTS. Further randomized controlled trials are needed to validate these findings and establish CMC-PEO as a new standard in rCTS revision surgery.

A-1018 A COMPARISON OF CT, MRI AND ARTHROSCOPY IN EARLY-STAGE CMC-1 OSTEOARTHRITIS

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Introduction: The Eaton-Littler classification of radiographic severity in thumb car-pometacarpal (CMC-1) osteoarthritis is widely used in treatment planning, though its correlation with clinical findings is weak. CT and MRI may serve as useful supplements to radiography in early-stage CMC-1 cases. Patients that do not improve with conservative treatment can be evaluated with arthroscopy prior to more invasive procedures. Arthroscopy offers valuable diagnostic insights and enables debridement, synovectomy, and electrothermal shrinkage in cases of hyperlaxity. While arthroscopy remains the gold standard for evaluating the degree of osteoarthritis, no studies have yet compared CT and MRI findings directly with arthroscopic evaluations in early- stage CMC-1

Aim: To describe the relation between CT, MRI, and arthroscopic findings in early-stage CMC-1 arthritis (Eaton-Littler stage 1–2) and evaluate how these relate to observed cartilage degeneration.

Materials and Methods: Twenty patients with symptomatic CMC-1 arthritis (Eaton-Littler stage 1–2) underwent pre-operative CT and MRI followed by arthroscopy. All received treatment with debridement, synovectomy, and electrothermal shrinkage when hyperlaxity was present. Imaging was graded using the Eaton-Littler classification and the Thumb Base OA MRI Scoring System (TOMS). Arthroscopic findings were evaluated according to the Badia classification and compared with imaging. Patients were registered in our surgical database for postoperative evaluation.

Results: The results indicate that CT and MRI were more accurate than standard radiographs in describing the degree of osteoarthritis and cartilage degeneration when compared with arthroscopic findings.

Conclusion: The findings suggest that CT and MRI correlate more closely with arthroscopic findings than standard radiographs in early-stage CMC-1 osteoarthritis. The results may help refine treatment strategies by improving the

accuracy of preoperative assessments and better matching patients with appropriate interventions based on the severity of their condition.

A-1019 INVESTIGATOR-BLINDED, RANDOMIZED, 3-MONTH, PARALLEL-GROUP STUDY TO COMPARE THE EFFECTIVENESS OF INTRAOPERATIVE TENDON SHEATH IRRIGATION ONLY WITH BOTH INTRAOPERATIVE AND POSTOPERATIVE IRRIGATION IN THE TREATMENT OF PURULENT FLEXOR TENOSYNOVITIS

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Introduction: The management of purulent flexor tenosynovitis of the hand consists of surgical debridement followed by antibiotic treatment. Usually, the debridement is carried out by irrigating the tendon sheath in a proximal to distal direction facilitated by two small incisions. It is unclear whether intraoperative irrigation by itself is adequate for healing or if it should be combined with postoperative irrigation in the ward.

Aim: The hypothesis of this randomized trial is that intraoperative catheter irrigation alone is as effective as a combination of intraoperative and postoperative intermittent catheter irrigation in the treatment of purulent flexor tenosynovitis.

Material & Methods: In this investigator-blinded, randomized trial, 50 participants with purulent flexor tenosynovitis were randomized in two groups. The study was conducted in the Department of Hand and Microsurgery at Tampere University Hospital between August 2015 and July 2023. The inclusion criteria were that all four Kanavel's signs (finger swelling, tenderness along the flexor tendon sheath, finger held in a flexed posture, and pain on passive extension) were met and the participant had to be over 18 years old. Exclusion criteria included high-pressure injuries, foreign body injuries and chemical injuries. Intraoperative catheter irrigation of the flexor tendon sheath and antibiotic treatment was identical in both groups, whereas only the participants in one group were subjected to intermittent postoperative catheter irrigation three times a day for 3 days. Operating surgeons randomized participants using sealed opaque envelopes. The primary outcome measure was total active range of movement of the affected finger after 3 months of surgery. The secondary outcome was the need for reoperation. Other outcome variables included the QuickDASH (Disabilities of the Arm, Shoulder and Hand) functional score and pain at rest (NRS, Numeric Rating Scale).

Results: For 24 participants, only intraoperative irrigation was performed, and for 26 participants, additional repeated irrigation was carried out in the ward. Total active range of motion the affected finger was 4 degrees better (95% confidence interval (CI) ranging from 32° better to 23° worse) in the repeated irrigation group versus the single irrigation group at 3 months. Number of reoperations was 1 in the single irrigation group versus 3 in the repeated irrigation group ($p = 0.66$). At the 3-month follow-up, pain at rest was 0.6 points lower (95% CI from 1.9 points lower to 0.7 points higher) and QuickDASH score was 1.0 point worse (95% CI from 14 points worse to 12 points better) in the repeated irrigation group compared to the single irrigation group. A tendon rupture was observed in one participant during follow-up in the single irrigation group.

Conclusions: Repetitive irrigation performed in the ward did not provide additional benefit in the treatment of purulent flexor tenosynovitis of the finger in terms of range of motion, pain or function during a 3-month follow-up.

A-1020 THUMB RECONSTRUCTION: THE ESSENTIAL ROLE OF MICROSURGERY IN RESTORING HAND FUNCTION

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Introduction: Thumb reconstruction is one of the most demanding challenges in hand surgery. Loss of the thumb severely compromises grip, opposition, and fine motor control. Modern microsurgical techniques have transformed reconstructive possibilities, enabling restoration of functional and sensate thumbs even in severe trauma.

Aim: To review and highlight the effectiveness of contemporary microsurgical techniques in thumb reconstruction and to outline the key algorithms guiding the choice of reconstructive strategy.

Material & Methods: A comprehensive review of current reconstructive options was performed, including microsurgical toe-to-thumb transfer, composite vascularized flaps, segmental replantation, and regional flaps such as the Foucher flap and heterodigital flaps. Indications, contraindications, surgical steps, and functional evaluation criteria were analyzed.

Results: Microsurgical reconstruction demonstrated superior outcomes in restoring length, opposition, mobility, and fine sensibility. Toe-to-thumb transfer remains the gold standard for major defects, with consistently high functional scores and patient satisfaction. Microsurgical replantation and vascularized reconstruction allowed preservation of native anatomy in segmental injuries. Regional flaps provided reliable alternatives when microsurgery was not feasible.

Conclusions: Microsurgery plays a central role in modern thumb reconstruction, offering the best functional restoration for complex injuries. A structured reconstructive algorithm, combined with microsurgical expertise, optimizes outcomes and reduces secondary interventions. Advances in microsurgery continue to elevate the standard of care for thumb reconstruction.

A-1021 OUR CLINICAL EXPERIENCE IN THE SURGICAL MANAGEMENT OF DUPUYTREN'S DISEASE

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Introduction: Dupuytren's disease represents a progressive fibroproliferative disorder of the palmar fascia, leading to functional impairment and significant disability. Despite multiple therapeutic options, surgical treatment remains the mainstay for advanced stages. Sharing institutional experience is essential for optimizing indications and refining outcomes.

Aim: To present our clinical experience in the management of Dupuytren's disease and to evaluate functional outcomes, complication rates, and recurrence after different surgical techniques.

Material & Methods: A retrospective analysis was conducted on patients treated for Dupuytren's disease at the Institute of Emergency Medicine, Republican Center for Microsurgery and Locomotor System Reconstruction, Chişinău. Patients with stage II–IV disease (Tubiana classification) underwent limited fasciectomy, dermofasciectomy, or percutaneous needle aponeurotomy, depending on severity and joint involvement. Functional assessment included range of motion, contracture correction, DASH scores, and recurrence rate at follow-up.

Results: Across the analyzed cohort, surgical treatment resulted in significant improvement in digital extension and global hand function. Limited fasciectomy offered predictable correction with a low complication rate. Dermofasciectomy demonstrated the lowest recurrence, particularly in cases with aggressive disease or skin involvement. Needle aponeurotomy ensured rapid recovery with minimal morbidity in selected early-stage cases. Overall complication rates were low, with isolated instances of wound healing delay and transient nerve paresthesia.

Conclusions: Our experience confirms that individualized treatment based on disease severity and patient profile yields

optimal outcomes in Dupuytren's disease. Limited fasciectomy remains the most reliable standard technique, while dermofasciectomy is superior in preventing recurrence in advanced or recurrent disease. Minimally invasive procedures offer excellent short-term function in early stages. A tailored algorithmic approach enhances functional restoration and patient satisfaction.

A-1022 IS IT EVER TOO LATE? FUNCTIONAL RECOVERY AFTER EPINEUROLYSIS IN SEVERE CARPAL TUNNEL SYNDROME

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Introduction: Stage 4 carpal tunnel syndrome (CTS) is characterized by absent sensory nerve action potentials and prolonged distal motor latency (4.5–6.5 ms) to the abductor pollicis brevis, often accompanied by median nerve epineurial fibrosis after several years.

Aim: This study evaluates whether median nerve epineurolysis (MNE) improves clinical and electrophysiological outcomes when combined with mini-invasive carpal tunnel release (CTR) in long-standing stage 4 CTS.

Material & Methods: In this prospective study, 125 patients (192 hands) with stage 4 CTS confirmed by nerve conduction studies (NCS), a minimum of two years symptom duration, and nocturnal pain interfering with sleep were enrolled. Of these, 21 hands had previously undergone CTR elsewhere and presented with persistent symptoms due to the absence of epineurolysis.

All patients underwent mini-invasive CTR combined with MNE performed in the same clinic by two surgeons following an identical standardized protocol. Outcomes included patient-reported nocturnal pain, numbness (measured by visual analog scale, VAS), overall satisfaction, and electrophysiological parameters (distal motor latency, compound muscle action potential [CMAP]) assessed preoperatively and one year postoperatively.

Results: Median nerve epineurial fibrosis was present in all cases. Postoperatively, nocturnal pain decreased significantly (VAS 7.9 to 1.4), and numbness improved by 2–3 months (VAS 7.2 to 2.3). Patient satisfaction was uniformly high. Electrophysiological results demonstrated a mean distal motor latency reduction of 0.5 ms and CMAP amplitude increase of approximately 1.5 mV.

Conclusions: In severe, longstanding CTS, surgical intervention combining mini-invasive CTR with epineurolysis performed by two surgeons under a unified protocol yields significant symptomatic and electrophysiological improvement. NCS remains essential to assess disease severity and guide surgical planning. Persistence of symptoms after carpal tunnel release is often linked to inadequate neurolysis. Therefore, epineurolysis is crucial, especially in cases of severe or persistent CTS.

A-1023 TRANSFORMING TFCC MANAGEMENT: PROVEN NON-OPERATIVE SUCCESS BACKED BY IMAGING AND SURGICAL OUTCOMES

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Introduction: Ulnar-sided wrist pain can present as a challenging complaint to both assess and treat. There are several differential diagnoses surgeons and therapists must contemplate when considering a potential pathology to this area. They should be equipped with the knowledge and skill set in applying their clinical assessment skills to rule out and / or confirm a patient's diagnosis. Triangular fibrocartilage complex (TFCC) pathology is one such finding.

Aim: The impression that TFCC non-operative treatment is difficult can often be anticipated due to the structure's complex anatomy. Patients at times come with their own biases that their ulnar-sided wrist problem will require imaging and invasive procedures such as injections or surgery to achieve successful healing. Such therapeutic measures pose economic burdens on patients within private healthcare systems as well as on public healthcare systems, for those living in such municipalities. This piece of work was designed to create a holistic patient-centred clinical recommendations intended to treat TFCC pathologies non-operatively with successful outcomes.

Methods: Over two years, three patients with confirmed TFCC tears were added to this cohort. Initially, they were all clinically diagnosed in Hand Therapy via a robust assessment and examination process. Evidence-based Hand Therapy treatment programmes were prescribed for all three patients. Therapeutic interventions included supportive strapping of the distal radial ulnar joint, manual therapy, targeted stretching and strengthening based on myofascial meridians.

Results: After these patients' TFCC pathologies were clinically diagnosed, imaging verifications of their TFCC tears were attained when investigating other concomitant pathologies. The following main pathological patterns were identified - 1) Highly complex TFCC tear with only a thin strand of tissue present on the radial aspect and the impression of a rotated flap on the volar aspect arising from the undersurface. 2) Change of position to the extensor carpi ulnaris tendon suspicious of a subsheath tear. 3) Subluxation and effusion of the extensor carpi ulnaris tendon subsheath along with focal tenosynovitis at the tip of the ulnar styloid. 4) Presence of a distal radial ulnar joint effusion with minor chondromalacia, suggestive of a full-thickness perforation which was not visible. After intensive courses of rehabilitation, all the patients' established TFCC tears were verified as healed. One by means of repeat MRI, the second through open surgery and the third via arthroscopy.

Conclusions: These case studies, along with the current evidence-base, demonstrate that there is scope for Hand Therapy mediation in treating TFCC tears to the point of healing. These results provide a basis for further research and are a key foundation for effective TFCC pathology management. Not only for interdisciplinary surgeon-therapist working, but also the patient-therapist relationship.

A-1024 BEYOND WATER: 3D LASER SCANNING OFFERS A CUTTING-EDGE ALTERNATIVE FOR UPPER LIMB VOLUME ASSESSMENT

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Introduction: Three-dimensional (3D) scanning offers new opportunities for objective volumetric assessment of the upper limb, potentially improving clinical monitoring and treatment planning in rehabilitation and lymphedema management. In hand therapy, accurate measurement of limb and hand volume is particularly relevant for edema and lymphedema, and could be extended to complex anatomical regions such as the thorax and shoulder where traditional methods are difficult to apply.

Aim: The primary aim of this study was to evaluate the reliability and efficiency of a 3D laser scanner for volumetric measurement of the upper limb, compared with the gold standard of non-reflux water displacement. A secondary aim was to explore the potential of 3D scanning for future application to hand lymphedema and complex anatomical districts, including the thorax and shoulder.

Material & Methods: Thirty healthy participants (18 women, 12 men) underwent volumetric assessment of the upper limb using both a 3D laser scanner and non-reflux water displacement. Inter-rater and intra-rater reliability were quantified using

the Intraclass Correlation Coefficient (ICC), and agreement between methods was examined with Bland–Altman analysis. Measurement and data-processing times were recorded for each technique to compare their feasibility in clinical settings. Results: The 3D scanner showed excellent reliability, with inter-rater ICC of 0.995 and intra-rater ICC of 0.991, exceeding the corresponding values for water displacement (ICC = 0.973 and 0.968, respectively). Bland–Altman analysis demonstrated good agreement between the two methods, with only two measurements falling outside the 95% confidence limits, although 3D scanning required longer acquisition (28.55 seconds) and processing times (120 seconds) compared with water displacement (9.64 seconds).

Conclusions: A 3D laser scanner provides highly reliable and precise volumetric measurements of the upper limb and represents a promising tool for clinical management of lymphedema and edema in hand therapy. Despite longer measurement times, its accuracy and adaptability suggest strong potential for future use in monitoring hand lymphedema and in evaluating edema in complex regions such as the thorax and shoulder, where conventional volumetric methods are less feasible

A-1025 EXERCISE-BASED CONSERVATIVE MANAGEMENT OF CHRONIC EXTENSOR CARPI ULNARIS (ECU) TENDINOPATHY IN A HANDSTAND ATHLETE: A CASE REPORT

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Introduction: This case is unique due to the management of chronic extensor carpi ulnaris (ECU) tendinopathy through exercise therapy. Exercise therapy rehabilitation is well known in shoulder and knee tendinopathies, but until now poorly described for wrist tendinopathies different from De Quervain. Moreover the patient's active engagement in non-traditional, wrist-intensive sports such as handstands, slacklining, and yoga, which could have been contributing to chronic extensor carpi ulnaris (ECU) tendinopathy was a challenge. Unlike more common ECU injuries observed in tennis or golf players, this case demonstrates how ECU tendinopathy can develop in less conventional sports. It adds to the scientific literature by showing that chronic ECU tendinopathy can be effectively managed through non-surgical rehabilitation tailored to the specific needs of the patient, in particular by using exercise therapy.

Case presentation: The patient presented with chronic left wrist pain, especially during ulnar deviation and resisted ECU testing, following two traumatic events. Examination revealed limited range of motion caused by pain, particularly in flexion, extension, and both ulnar and radial deviations. Ultrasound imaging confirmed ECU tenosynovitis with mild inflammation of other wrist tendons and a small synovial cyst on radio-scapho-lunate level. ECU stability during forearm rotation was confirmed both clinically and by ultrasound.

Clinical Discussion: The diagnosis of chronic ECU tenosynovitis was managed conservatively with a targeted rehabilitation program focused on isometric strengthening and progressive resistance exercises. Over one month, the patient demonstrated marked improvement in wrist strength, pain reduction, and functional capacity, allowing for a gradual return to sporting activities.

Conclusions: The main takeaway from this case is that chronic ECU tendinopathy can be successfully managed through individualized, conservative treatment based on exercise therapy. Early intervention, patient adherence, and rehabilitation tailored to the athlete's specific demands are crucial for recovery, even in chronic cases, without the need for surgical intervention.

A-1027 FACTORS ASSOCIATED WITH CONSOLIDATION TIME IN 3D CORRECTIVE OSTEOTOMIES OF MALUNITED DISTAL RADIUS FRACTURES

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Introduction: Three-dimensional (3D) corrective osteotomies for malunited distal radius fractures represent a promising technique with the potential to precisely calculate wedge volume and cortical distances at the osteotomy site. These measurements could serve as key parameters for predicting bone healing.

Aim: To evaluate the rate of bone healing based on wedge volume and volar cortical contact following corrective osteotomy for distal radius malunion.

Material & Methods: This is a retrospective study. Bone consolidation was initially assessed by a student-researcher and subsequently by an experienced trauma surgeon. All surgeries were performed by the same surgeon. Explanatory variables included wedge volumes and presence or absence of volar cortical contact. Outcome variables included consolidation time (in days).

Results: In the bivariate analysis, consolidation time was significantly associated with wedge volumes (regression coefficient [RC] = 0.043). For every 1000 mm³ increase in wedge volume, the consolidation time increased by 43 days. Osteotomies with volar cortical contact demonstrated significantly faster consolidation times compared to those without volar cortical contact, with median healing times of 136 days versus 214 days, respectively.

Conclusions: After corrective osteotomy for distal radius malunion, a wedge volume increase of 1000 mm³ is associated with an additional 43 days of consolidation time. Additionally, the presence of volar cortical contact contributes to faster healing.

A-1028 THE TREATMENT OF BURN INJURIES OF THE HAND WITH REGENERATIVE MEDICAL APPROACHES

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Introduction: The standard treatment for deep partial-thickness burns (DPTB) and full-thickness burns (FTB), including those affecting the hand and upper extremity, remains tangential excision followed by autologous skin grafting. However, unresolved issues include the frequent occurrence of delayed healing and contractures.

In the era of regenerative medicine, several innovative techniques have been proposed to advance the management of burn injuries, particularly in debridement and wound coverage. Enzymatic debridement, cell-based therapies, and skin substitutes have emerged as promising alternatives to traditional treatment paradigms.

Aim: In the present study, we discuss the use of regenerative approaches for treating burn injuries of the hand and upper extremity at the largest Burn Center in Switzerland.

Materials & Methods: We conducted a retrospective review of patients with DPTB and FTB of the upper extremity and hand who were treated with bromelain-based enzymatic debridement followed by either cell therapy using stromal vascular fraction (SVF, derived from autologous subcutaneous fat tissue) combined with platelet-rich fibrin (PRF, derived from autologous venous blood) or various skin substitutes (fish skin, synthetic or biological dermal substitutes) at the Burn Center of the University Hospital Zurich between 2019 and 2024. Data collected included pretreatment protocols, timing and technique of enzymatic debridement, subsequent wound management strategies, clinical outcomes, and complication rates.

Results: A total of 42 patients were included, of whom 18 had FTB and 24 had DPTB. The mean abbreviated burn severity

index (ABSI) score was 7.1, and the mean total body surface area (TBSA) affected was 29.5%. Following enzymatic debridement, eight patients were treated with SVF/PRF, while the remaining 34 patients were managed with skin substitutes. Three of the eight patients treated with SVF/PRF required subsequent debridement and skin grafting. Of the 34 patients treated with skin substitutes, 27 ultimately required skin grafting. No increased infection rates were observed. Conclusion: The combination of bromelain-based enzymatic debridement with cell therapy or skin substitutes represents a novel regenerative approach to burn care that may offer particular advantages in hand burns, where preservation of dermal tissue can significantly improve functional outcomes. Our data suggest that SVF/PRF is associated with unpredictable results and a high rate of subsequent skin grafting. In contrast, certain skin substitutes, particularly fish skin, appear to promote granulation and may reduce or eliminate the need for autologous skin grafting, especially in DPTB. Dermal substitutes constitute an alternative to classic flap surgeries in selected cases.

A-1029 RESTORING BALANCE IN ACUTE HAND THERAPY: THREE LEVELS OF BALANCE ACHIEVED THROUGH STRUCTURED GROUP THERAPY

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Introduction: Acute hand-injury rehabilitation requires early, frequent and well-guided mobilisation to prevent stiffness. In clinical practice, three relevant imbalances often occur.

Imbalance 1: The demand for early and intensive therapy exceeds available clinical resources.

Imbalance 2: Patients within the same group present with different injuries, healing stages, pain levels and functional capacities, requiring an approach that balances standardisation and individualisation.

Imbalance 3: Patient-related factors such as fear, uncertainty and protective behaviour contrast with the therapeutic need for early activation.

This work examines how a structured group-therapy model can restore these three imbalances in the acute phase of hand therapy.

Aim: To present a group-therapy concept that re-establishes balance between demand and resources, between standardised guidance and individual therapeutic adaptation, and between protective behaviour and early functional activation.

Material & Methods: A structured group-therapy programme for up to ten patients was developed, independent of diagnosis or injury history. Each session followed a fixed sequence: warm-up and functional mobility, targeted strength and dexterity tasks, ADL-related activities using everyday objects, playful activation tasks, and neurocognitive elements such as movement observation and graded motor imagery. Social interaction and motivational dynamics were considered therapeutic components. Feasibility and therapeutic effects were monitored using a digital hand-function assessment tool with colour-coded visualisation.

Results: The structured programme addressed all three imbalances.

Imbalance 1 was reduced by treating multiple patients simultaneously within a guided programme, increasing efficiency while maintaining therapeutic supervision.

Imbalance 2 was balanced through a fixed framework that enabled rapid individual adjustments in dosage, range of motion and task intensity, allowing safe participation despite differing injuries, healing stages and abilities.

Imbalance 3 was reduced through communication strategies that decreased fear, improved confidence and supported early functional movement within a safe group environment.

Conclusions: Structured group therapy can restore key imbalances in acute hand rehabilitation. It aligns therapy demand

with available resources, maintains consistent therapeutic guidance while enabling individual adjustments, and supports early activation through reduced fear and improved confidence. This multilevel approach may enhance functional outcomes and contribute to more sustainable and efficient acute hand-therapy services.

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A-1030 IMPLEMENTING EARLY ACTIVE REHABILITATION AFTER MOTEC TOTAL WRIST ARTHROPLASTY: INSIGHTS FROM A CASE SERIES

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Introduction: During recent decades, total wrist arthroplasties (TWA) have evolved to better respect wrist biomechanics, resulting in fourth-generation implants with substantial improvements of design and function, such as the Universal, ReMotion, Freedom, Motec and Maestro Implants. These fourth-generation arthroplasties have demonstrated effective pain reduction and improved wrist function. Among them, the Motec implant has shown the most favourable results, achieving the highest 10-year survival rate at 10-year of 86% in high demand, young, non-RA patients. The currently documented postoperative regime for Motec TWA involves six weeks of cast immobilisation, after which unrestricted motion and load-bearing activities may be initiated. We believe that initiating therapy earlier may be equally, if not more, effective in improving wrist mobility, reducing pain, and enhancing grip strength.

Aim: In this case series report, we aim to describe the outcomes of an early active rehabilitation programme following Motec TWA, focusing on wrist mobility, pain, and grip strength.

Material & Methods: Five patients who underwent Motec total wrist arthroplasty were included in this prospective case series. In our clinic, Hand & Wrist Centre, postoperative therapy was initiated within 7 days after surgery and consisted of protective splinting combined with supervised hand therapy. An early active rehabilitation programme was implemented, focusing on controlled wrist motion and progressive functional use.

Clinical outcomes were assessed at three time points: preoperatively (baseline), and at 12 and 24 weeks postoperatively. Outcome measures included pain (reported on a visual analogue scale), active range of motion (AROM) of the wrist, and grip strength measured using a dynamometer.

Results: We found no statistically significant improvements in wrist motion, grip strength, or pain reduction from baseline to 24 weeks. However, at 24 weeks, wrist motion was comparable to baseline and demonstrated modest improvements, grip strength showed slight gains, and patients reported a clinically meaningful reduction in pain compared with preoperative levels.

Conclusions: This is a small case series report with a limited follow-up period, and the findings should therefore be interpreted cautiously. Nonetheless, our results suggest that an early active rehabilitation regimen following Motec total wrist arthroplasty is a feasible treatment option. Further research with larger cohorts and longer-term follow-up is needed to confirm its safety and potential benefits.

A-1031 RESTORING BALANCE: A RETROSPECTIVE REVIEW ON THERAPY OUTCOMES FOLLOWING EXTENSOR TENOLYSIS AND CAPSULOTOMY POST-PIPJ ARTHROPLASTY

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Introduction: Aim: To retrospectively evaluate therapy outcomes following extensor tenolysis and capsulotomy post-PIPJ arthroplasty at the Cape Hand and Upper Limb Unit, Cape Town.

Material & Methods: This retrospective chart review examined 10 patients (n=12 joints) who underwent PIPJ extensor tenolysis and/or capsulotomy following PIPJ arthroplasty performed by a single surgeon between 2021-2025. The cohort included predominantly female patients (93.3%) with a mean age of 68.0 years (range 60-79 years). The affected hand was right-sided in 80.0% of cases, with the middle finger being most commonly affected (46.7%). Prosthesis types included silicone implants (40.0%) and surface replacement arthroplasty (60.0%). Data collection encompassed PIPJ active range of motion measurements obtained pre-operatively, intra-operatively, and post-operatively over six months. Pain levels were assessed using the Numeric Pain Rating Scale at pre-procedure and six-month time points. Patient satisfaction scores were recorded at six months post-operatively, and factors contributing to complications were analysed. Statistical analysis employed paired-sample t-tests and ANOVA to examine changes across time points, with a minimum follow-up period of six months. Ethical clearance was granted for this retrospective analysis.

Results: The study demonstrated significant improvements in active range of motion following tenolysis and capsulotomy procedures. For surface replacement prostheses, mean active range of motion increased from 33.1° pre-operatively to a peak of 82.0° intra-operatively, achieving 75.1° at six months post-operatively, representing a substantial improvement of 41.9°. Silicone prostheses showed comparable recovery patterns, improving from 35.2° pre-operatively to 81.2° intra-operatively and 78.5° at six months, demonstrating peak improvement of 43.3° intra-operatively. Pain outcomes revealed excellent reduction, with surface replacement cases decreasing from 4.4/10 pre-procedure to 0.1/10 at six months (98% improvement), whilst silicone prostheses decreased from 4.0/10 to 0.5/10 (88% improvement). Notably, 80% of patients achieved complete pain resolution (0/10) by six months. Patient satisfaction remained high, with 89% satisfaction for surface replacement and 83% for silicone prostheses at six months.

Conclusions: These findings support the effectiveness of secondary surgical intervention combined with structured hand therapy for managing post-arthroplasty stiffness. Statistical analysis revealed no significant difference in range of motion at the six-month mark between surface replacement and silicone prostheses, with both achieving stable outcomes following capsulotomy and extensor tenolysis

A-1032 PREVALENCE OF SCAPHOLUNATE AND LUNOTRIQUETRAL INTEROSSEOUS LIGAMENT VARIATIONS IN PEOPLE WITH AND WITHOUT DISCOMFORT: SYSTEMATIC REVIEW AND POOLED ANALYSIS

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Introduction: Scapholunate and lunotriquetral interosseous ligament (SLIL/LTIL) disruptions are well-recognized in major wrist trauma such as peri-lunate wrist dislocations. However, changes in these ligaments are increasingly identified in patients with non-specific wrist discomfort due to the widespread use of advanced imaging and arthroscopy. The clinical relevance of such findings is unclear, as several studies suggest that SLIL and LTIL variations may represent age-related changes rather than true pathophysiology due to injury. Understanding the prevalence of these variations,

both in symptomatic and asymptomatic individuals, is essential for interpreting imaging findings and guiding clinical decision-making.

Aim: Therefore we asked: (1) What is the prevalence of LT and SL variations reported in the literature by age? (2) What is the prevalence of LT and SL variations reported stratified by age and symptoms?

Material & Methods: A systematic search of MEDLINE, EMBASE, and the Cochrane Library was conducted through 11 August 2025 using predefined terms related to scaphoid, lunate, triquetrum, and ligament variations. Eligible studies reported SLIL and/or LTIL variations and provided patient age or age-group data. Non-English/Dutch/German articles, case reports (<3 subjects), and abstracts were excluded.

Fourteen studies met inclusion criteria, comprising 1239 subjects with 329 SLIL and 323 LTIL variations. Ten studies included patient with wrist pain, four included asymptomatic wrists (cadavers or contralateral controls). Extracted variables included author, year, population type, age, method of assessment, and presence of SLIL or LTIL abnormality. Patients were stratified into four age groups: <30, 30–49, 50–69, and ≥70 years. Pooled proportions were calculated for SLIL and LTIL variations overall and within symptomatic and asymptomatic groups. Age associations were evaluated using Pearson's chi-square tests. Odds ratios with 95% confidence intervals were computed for age-related differences. **Results:** Across all studies, SLIL variations increased from 13% in patients <30 years to 42% in those ≥70 years ($p < 0.001$). LTIL variations increased similarly with age, from 13% (<30 years) to 49% (≥70 years) ($p < 0.001$).

Among asymptomatic wrists ($n = 665$), SLIL variations rose from 0% in individuals <30 years to 41% in those ≥70 years ($p < 0.001$). Asymptomatic LTIL variations also increased significantly, from 15% (<30 years) to 49% (≥70 years) ($p < 0.001$). In symptomatic patients, SLIL variations increased from 16% (<30 years) to 50% (50–69 years) ($p < 0.0001$). LTIL variations rose from 12% to 35% across the same age groups ($p < 0.001$). The symptomatic ≥70-year group was too small for reliable analysis. Odds ratios increased steadily with age for both ligament variations, reaching 4.8 (95% CI 3.3–7.0, $p < 0.001$) for SLIL and 6.4 (95% CI 4.4–9.3, ($p < 0.001$)) for LTIL in those ≥70 years.

Conclusions: SLIL and LTIL variations seem to be a normal aspect of human ageing. Since these variations are common in people with and without wrist discomfort, it's difficult to establish them as symptom generators. This complicates the offer of surgery to address these variations outside of obviously traumatic ruptures.

A-1033 EXAMINING REPORTED INJURY PATTERNS OF WRIST DISLOCATIONS AND FRACTURES AROUND THE LUNATE: A SCOPING REVIEW

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Introduction: Wrist dislocations and fractures around the lunate represent a complex and heterogeneous group of injuries. Multiple classification systems exist to describe these patterns, but inconsistencies in definitions, scope, and clinical intent hinder comparison between studies and limit their clinical application. Knowledge of the available classification systems and their construct validity would provide a foundation for future studies to refine or validate these systems, and enhance their clinical utility in research and communication.

Aim: Therefore, using a scoping review, we asked: (1) What classifications and injury patterns are reported to describe wrist dislocations and fractures around the lunate? (2) What is known about the construct validity of the reported classifications?

Material & Methods: A scoping review was performed according to PRISMA-ScR guidelines. Medline, Embase, and the Cochrane Library were searched to February 20, 2025, using keywords related to the lunate, wrist dislocations, and classification systems. Studies of any design that described or applied a classification system for wrist dislocations or

fractures around the lunate and were published in peer-reviewed journals were eligible. Two reviewers independently screened titles, abstracts, and full texts. Data extracted included the classification system described or applied, and elements informing construct validity. A total of 6498 studies were identified of which 211 met inclusion criteria. Twelve repeatedly used classification systems were identified.

Results: The Mayfield, Johnson (greater/lesser arc), and Herzberg (perilunate dislocations and perilunate fracture dislocations) classification systems were the most frequently applied. The classification systems varied widely in definitions, injury mechanisms, and scope, and no single classification encompassed the full spectrum of reported injury patterns. Construct validity was limited across systems. Most classifications were developed from small clinical series or cadaveric experiments. Reliability testing was rarely performed, leaving inter-observer agreement largely unknown.

Conclusions: The heterogeneity, inconsistent terminology, and limited reliability restrict the use of a single classification for clinical decision-making and outcome comparison. However, despite the lack of comprehensive validation, existing classification systems collectively seem to capture most observed injury variations. A consensus combined classification, followed by validation in a large clinical cohort, may improve consistency and enhance the utility of perilunate injury classification.

A-1034 INVESTIGATING RISK FACTORS FOR AVASCULAR NECROSIS IN SCAPHOID NON-UNION: A HISTOPATHOLOGICAL STUDY WITH PROPENSITY SCORE ADJUSTMENT

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Introduction: Avascular necrosis (osteonecrosis) of the proximal fragment is a critical determinant of treatment strategy in scaphoid non-union. Although preoperative MRI and intraoperative punctate bleeding are commonly used to evaluate vascularity, previous reports have demonstrated inconsistent agreement with histopathological findings.

Aim: The present study aimed to identify clinical and radiographic predictors of histologically confirmed osteonecrosis.

Material & Methods: This ethics-approved study included 60 hands with scaphoid non-union that underwent collection of proximal fragment bone samples during surgery. Clinical factors and radiological factors were analyzed. Simple comparisons were performed, followed by propensity score (PS) adjustment.

Results: After excluding six cases with missing MRI data, 60 hands were analyzed. Histopathologically confirmed osteonecrosis was present in 42 hands. No significant differences were found in age, time from injury, previous surgery, MRI signals, or CT morphology. The only significant factor was the relative size of the proximal fragment: 49.8% in the osteonecrosis group vs. 61.5% in the non-osteonecrosis group ($p=0.001$). PS-adjusted logistic regression confirmed fragment size as an independent predictor (OR 1.06, 95% CI 1.01–1.13, $p=0.047$). ROC analysis showed AUC 0.766.

Conclusion: Proximal fragment size is the only clinical or radiographic factor significantly associated with histologically confirmed osteonecrosis. These findings may help refine surgical decision-making, particularly regarding vascularized bone graft indications.

Conclusions:

A-1035 CAN END-ORGAN JOINT MOTION RESTRICTION PREDISPOSE TO DE QUERVAIN DISEASE?

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Introduction: De Quervain disease is a common stenosing tenosynovitis affecting the first dorsal extensor compartment of the wrist. Although traditionally considered an inflammatory condition, growing evidence indicates that its pathology is more consistent with a degenerative rather than an inflammatory process. Several predisposing factors have been identified, including female sex, gestational or postpartum period, and anatomical variations such as the presence of a subcompartmental septum. However, these factors mainly focus on the characteristics of the first extensor compartment itself.

Aim: We hypothesized that physiological limitations of MCP flexion or variations in TMC joint abduction angles might create functional imbalance within the thumb ray, thereby predisposing individuals to the development of De Quervain disease.

Material & Methods: This case–control study included two groups of adults aged 18 years or older.

1. Control group: Participants with no known local or systemic condition affecting thumb motion. These individuals were companions of hand-surgery patients or same-day clinic patients from obstetrics & gynecology, otolaryngology, or urology departments.

2. De Quervain group: Patients diagnosed with De Quervain tenosynovitis based on classical clinical findings, including localized tenderness over the first extensor compartment and positive Finkelstein and WHAT tests. All diagnoses were confirmed by a certified hand surgeon. No participant had prior thumb surgery.

For both groups, demographic variables (age, sex, occupation, dominant side), passive TMC palmar and radial abduction angles, MCP flexion angle, and interphalangeal (IP) flexion degree were recorded. Joint angles were measured bilaterally using a standard goniometer following American Society of Hand Therapists (ASHT) guidelines. Participants were seated with the forearm in neutral rotation and the wrist in slight extension. Each measurement was repeated three times, and the mean value was used for analysis. Because the primary focus of this study was the functional relationship between proximal and distal thumb joints, TMC palmar abduction, TMC radial abduction, and MCP flexion angles were selected for detailed evaluation.

In the De Quervain group, special care was taken to minimize pain-related measurement bias. Patients received NSAIDs and a brief course of physical therapy before assessment, ensuring that pain had decreased sufficiently to allow reliable evaluation. To further confirm measurement accuracy, each patient's affected thumb was compared with their contralateral, asymptomatic thumb, providing an internal reliability control.

Results: Compared with controls (727 thumbs), patients with De Quervain's tenosynovitis (37 thumbs) demonstrated significantly reduced TMC joint mobility, including decreased radial abduction ($51.7 \pm 8.8^\circ$ vs $73.9 \pm 27.0^\circ$) and palmar abduction ($52.7 \pm 11.1^\circ$ vs $72.7 \pm 19.2^\circ$). No significant side-to-side differences were observed within the De Quervain cohort, suggesting that the observed limitation represents a systemic anatomical or physiological characteristic rather than a consequence of pain.

Conclusions: These findings indicate that patients with De Quervain disease exhibit physiological limitations of the TMC joint. Such restriction may create a potential imbalance between MCP flexion capacity and TMC joint mobility. This imbalance could alter load distribution across the first extensor compartment, contributing to the underlying pathomechanics of De Quervain disease. Further research is required to more clearly define this MCP–TMC balance and to understand its clinical relevance.

A-1036 EVALUATION OF THE EFFECTS OF VALGUS MOMENTS ON THE MEDIAL COLLATERAL LIGAMENT AND THE CAPITELLUM OF THE HUMERUS USING FINITE ELEMENT ANALYSIS

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Background: Among the components of the medial collateral ligament of the elbow, the anterior oblique ligament (AOL) serves as the primary stabilizer against valgus moments and consists of two bundles: the anterior band (AB) and the posterior band (PB). We previously analyzed the tensile forces applied to each fiber of the AOL during valgus loading using finite element analysis. In this study, we increased the number of models for further investigation. We also examined the stress applied to the capitellum of the humerus during valgus loading.

Methods: CT scans of fresh-frozen cadaveric elbows from healthy donors were obtained, and ten finite element models were created at joint angles from 0° extension to 135° flexion at 15° increments using the finite element software Mechanical Finder. Regions of interest of the humerus, radius, and ulna were extracted to construct the models, and the proximal portions of the radius and ulna were expanded to represent cartilage.

The radius and ulna were transected around the mid-diaphysis and integrated with a resin model. Truss elements were applied between the humerus and ulna, incorporating previously obtained data for AB and PB. A contact condition was set between the humerus and cartilage, and with the humerus fixed, a valgus moment equivalent to 50 N was applied to the resin portion of the forearm bones.

Tensile forces in the AB and PB truss elements were compared across models. The capitellum was divided into four quadrants from medial to lateral, and the equivalent stress during valgus loading was measured at each flexion angle.

Results: The AB exhibited the greatest tension at 0°, and tension decreased progressively with flexion, reaching its minimum at 135°. Conversely, PB tension was lowest at 0° and increased with flexion, peaking at 135°. The angle at which both bundles exhibited nearly equal tension was 60°.

Regarding the capitellum, lateral regions experienced higher stress with increasing flexion.

Discussion: The AB is taut in extension, while the PB becomes increasingly tensioned in flexion. The angle at which both bundles exhibit equal tension—60°—appears to offer the strongest resistance to valgus stress and may represent the least vulnerable position for ligament injury during valgus-loading movements.

Additionally, the capitellum demonstrated greater lateral stress with deeper flexion, suggesting that deep flexion may increase the risk of cartilage injury due to valgus stress.

A-1037 RESTORING INTRINSIC-EXTRINSIC MUSCLE BALANCE: CLINICAL OUTCOMES FOLLOWING A STRETCHING/STRENGTHENING PROGRAMME FOR INTRINSIC TIGHTNESS OF THE HAND

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Introduction: Intrinsic muscle tightness of the hand represents adaptive shortening of the interossei muscles, characterised by gradual onset with fatigue and aching in the palm and/or dorsal hand. This condition affects populations engaged in repetitive activities requiring independent finger control, particularly young musicians and desk workers presenting with diffuse, deep ache that is difficult to localize. The intrinsic muscles are crucial for hand function, accounting for 85% of pinch strength and 53% of grip strength while maintaining balance with extrinsic muscles for fine motor tasks and

grasping activities. Despite their functional importance, clinical outcomes following conservative management remain poorly documented.

Aim: To evaluate clinical outcomes following a conservative stretching and strengthening programme for intrinsic muscle tightness in patients with non-specific hand pain.

Methods and Materials: A single-centre prospective study was conducted at Cape Hand Clinic, Vincent Pallotti Hospital, Cape Town, between 2015 and 2025. Thirty-nine patients with intrinsic muscle tightness and non-specific hand pain were enrolled following informed consent. Inclusion criteria specified intrinsic tightness without localized hand pain. Exclusion criteria included history of trauma, previous surgery, rheumatoid arthritis, or osteoarthritis. All participants received standardized assessment and a structured home-based stretching and strengthening programme. Outcome measures included Visual Analogue Scale for pain, proximal interphalangeal joint flexion range of motion, and patient satisfaction scores using a five-point Likert scale (0=no improvement to 5=excellent improvement), assessed at baseline, three months, and six months.

Results: Mean follow-up was four months. The cohort comprised 20 males and 19 females with mean age 29 years, including students, administrative workers, and desk workers. Eleven patients (28%) were musicians. Hand dominance showed 22 right-hand dominant, 9 left-hand dominant, and 8 bilateral presentations. The ring finger was most frequently affected (17 patients), followed by middle finger (11), index finger (7), and little finger (4). Pain scores demonstrated significant reduction from mean 6 (SD 1.27) initially to 2 (SD 1.83) at three months and 1 (SD 1.14) at six months. Mean PIPJ flexion ROM measured 101 degrees initially, decreased to 74 degrees during hyperextension phase at three months, and improved to 92 degrees at six months. Patient satisfaction revealed 59% reported good to excellent improvement with no limitation and minimal pain, 15% achieved acceptable outcomes, while 13% demonstrated minimal to moderate improvement.

Conclusion: This study demonstrates the effectiveness of conservative stretching and strengthening programmes for intrinsic muscle tightness with non-specific hand pain. Nearly 60% of patients achieved good to excellent outcomes with significant pain reduction. The findings support targeted hand therapy intervention for managing intrinsic muscle dysfunction in young adults engaged in repetitive fine motor activities, contributing valuable evidence to limited existing literature.

A-1038 BALANCING CONSERVATIVE MANAGEMENT AND CLINICAL OUTCOMES: A RETROSPECTIVE EVALUATION OF NEUROGENIC THORACIC OUTLET SYNDROME REHABILITATION

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Introduction: Neurogenic Thoracic Outlet Syndrome (nTOS) presents as a complex condition involving compression of the neurovascular bundle as it traverses the thoracic outlet, being diagnosed in 90-95% of Thoracic Outlet Syndrome cases. Treatment approaches vary considerably, with efficacy of specific interventions remaining inconclusive. Recent research emphasizes identifying positive and negative prognostic factors contributing to treatment outcomes, highlighting the need to balance conservative management strategies with optimal patient outcomes.

Aim: To retrospectively evaluate clinical outcomes of conservative management for patients with nTOS who underwent rehabilitation at the Cape Hand and Upper Limb Unit, Pinelands, Cape Town, examining the balance between treatment intensity and functional recovery.

Material & Methods: A non-experimental retrospective chart review examined patient records from 2014-2024 using purposive sampling. Of 192 patients referred, 133 completed a six-month rehabilitation programme. Sociodemographic

data and treatment details were collected through retrospective chart review. The standardized DASH questionnaire and Numeric Pain Rating Score (NPRS) were completed at initial visit (T0), three months (T1) and six months (T2). Statistical analysis employed paired-sample t-tests, ANOVA for parametric variables, and chi-square tests for frequencies, with significance accepted at $P \leq 0.05$.

Results: The cohort comprised 71.4% females and 28.6% males aged 15–60 years. The dominant arm was affected in 51.9% of patients, with bilateral involvement in 17.3%. Most patients (71.4%) had sedentary occupations, with 66.9% participating in sports activities. Hand surgeons referred 59.4% of patients, while shoulder specialists diagnosed 29.3% of nTOS cases. The majority (69.2%) experienced symptoms exceeding 12 months before commencing rehabilitation. Cervical rib was confirmed in 4.51% of patients, and 45.8% were on antidepressants. Statistical analysis revealed significant improvements in both DASH scores and pain levels across the treatment period. The 15–25 age group demonstrated the greatest improvement, while the 46–60 age group maintained highest DASH scores at T2. Sedentary occupations showed higher baseline pain scores (7.26) compared to labourers (6.71). Treatment modalities including manual mobilisation, active exercises and activity modification collectively resulted in 56–58% pain reduction. Surgery was required in 21.8% of patients after six months of conservative management.

Conclusions: This study demonstrates that balancing multimodal conservative physiotherapy management with systematic outcome measurement provides valuable insights into nTOS treatment effectiveness. The positive results across treatment modalities emphasize tailoring interventions to individual patient needs and promoting active patient involvement, particularly through activity modification, to optimize outcomes. However, high initial pain and disability scores highlight the challenging nature of nTOS and the importance of early intervention with patient education in managing expectations and improving long-term outcomes.

A-1039 TOTAL ELBOW ARTHROPLASTY VERSUS OPEN REDUCTION AND INTERNAL FIXATION FOR CORONAL SHEAR FRACTURES OF THE DISTAL HUMERUS IN ELDERLY PATIENTS: A RETROSPECTIVE STUDY

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Introduction: Coronal shear fractures of the distal humerus are uncommon yet inherently unstable fractures. In elderly patients, management of coronal shear fractures is particularly demanding, as osteoporosis, posterior column comminution, and compromised vascularity often result in unsatisfactory outcomes following open reduction and internal fixation (ORIF). Especially in Dubberley type 3B coronal shear fractures (type 3B fractures) characterized by fragmentation of both the capitellum and trochlea, previous studies have reported a higher rate of complications such as nonunion and malunion compared with other types. Total elbow arthroplasty (TEA) is performed as a primary treatment for comminuted intra-articular fracture in elderly patients; however, evidence focusing specifically on TEA for coronal shear fractures, especially type 3B fractures, remains unclear.

Aim: To compare clinical and radiographic outcomes and complication profiles between TEA and ORIF in patients aged ≥ 65 years presenting with coronal shear fractures of the distal humerus, and to assess the effectiveness of TEA in the management of type 3B fractures.

Material & Methods: Materials and Methods: A retrospective review was conducted of 22 consecutive patients treated surgically for coronal shear fractures at our institution and its affiliated centers. Patients were divided into three groups according to fracture subtype and surgical method: ORIF for type 3B fractures (O3B group, $n = 4$), TEA for type 3B fractures

(T3B group, $n = 5$), and ORIF for all other coronal shear fracture types (Non-3B ORIF group, $n=13$). Clinical assessment included elbow range of motion, the Mayo Elbow Performance Score (MEPS), radiographic findings, and postoperative complications. Statistical analysis was performed using ANOVA with Tukey's HSD post-hoc test (significance set at $p < 0.05$). Results: The baseline characteristics, including age, time to surgery, and follow-up duration were similar in these groups. At the following up, the O3B group demonstrated markedly inferior functional outcomes, with lower MEPS than both the T3B and Non-3B ORIF group ($p = 0.001$). Radiographically, the O3B group showed a high frequency of fixation-related complications, including cubitus valgus, capitellar malunion, capitellar nonunion. In contrast, complications in the T3B group were minimal; no prosthetic loosening occurred in any case, and only one patient showed nonunion of an olecranon avulsion fracture. TEA consistently was suggested to provide better functional recovery and lower complications rates in type 3B fractures.

Conclusions: In elderly patients with type 3B fractures, TEA was associated with superior functional outcomes and a lower rate of complications compared with ORIF. TEA may therefore be considered a valuable primary treatment option for elderly individuals with coronal shear fractures of the distal humerus at high risk of fixation failure.

A-1041 PREOPERATIVE PSYCHOLOGICAL FACTORS PREDICT ONE-YEAR FUNCTIONAL OUTCOMES AFTER UPPER LIMB SURGERY: A MULTIGROUP ANCOVA AND INTERACTION ANALYSIS

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Introduction: Psychological factors such as pain catastrophizing, central sensitization, and depressive symptoms are increasingly recognized as important determinants of postoperative outcomes in musculoskeletal care. However, evidence in upper limb surgery remains limited, and it is unclear whether these factors influence recovery uniformly across diverse upper-extremity conditions. Given the heterogeneity of upper-limb pathologies—from nerve compression to tendon injuries and osteoarthritis—understanding how psychological distress affects functional improvement in different diagnostic categories may help refine prognostic evaluation and perioperative management.

Aim: This study aimed to evaluate the extent to which preoperative psychological factors—catastrophic thinking (Pain Catastrophizing Scale, PCS), central sensitization (Central Sensitization Inventory, CSI), and depressive symptoms (Self-rating Depression Scale, SDS)—influence 1-year postoperative changes in upper-extremity disability (Δ DASH: Disabilities of the Arm, Shoulder and Hand) in patients undergoing upper-limb surgery. A further objective was to determine whether the impact of these psychological factors differs across diagnostic groups (psychological factor $\times$ disease-group interaction). Material & Methods: This single-center retrospective study included patients who underwent upper-extremity surgery between January 2020 and November 2024 and had available DASH scores both preoperatively and at 1-year follow-up. Patients were categorized into six diagnostic groups: osteoarthritis, peripheral nerve disorders, tendon/ligament injuries, bone procedures, contracture/scarring, and tenosynovitis/synovitis. Cases involving infection, implant removal, or tumors were excluded. The primary outcome was Δ DASH (postoperative minus preoperative). Analysis of covariance (ANCOVA) adjusted for preoperative DASH, age, sex, psychological factors, and diagnostic group. Interactions between psychological factors and diagnostic groups were examined, followed by estimation of simple slopes for each group.

Results: A total of 397 patients were included: osteoarthritis ($n=95$), peripheral nerve disorders ($n=136$), tendon/ligament injuries ($n=50$), bone procedures ($n=51$), contracture/scarring ($n=17$), and tenosynovitis/synovitis ($n=48$). Across all groups, DASH ($32.6 \rightarrow 19.8$, $p < 0.01$) and PCS ($23.5 \rightarrow 14.2$, $p < 0.01$) improved significantly, whereas CSI ($21.7 \rightarrow 21.6$, $p = 0.93$) and SDS ($50.1 \rightarrow 49.4$, $p = 0.13$) showed no significant change. In ANCOVA, higher preoperative CSI ($+5.46/SD$, $p < 0.01$),

SDS (+2.02/SD, $p < 0.03$), and age (+2.76/SD, $p < 0.01$) were independently associated with poorer Δ DASH, whereas PCS (−1.11/SD, $p = 0.20$) was not.

Interaction analyses showed significant psychological factor $\times$ group interactions for CSI ($p < 0.001$) and PCS ($p = 0.006$). Simple-slope analyses revealed pronounced CSI effects in peripheral nerve disorders ($\beta = +6.98$ /SD), tendon/ligament injuries ($\beta = +5.55$ /SD), and osteoarthritis ($\beta = +5.57$ /SD). PCS showed a negative effect in the peripheral nerve disorder group ($\beta = -4.63$ /SD) but a positive effect in the bone-procedure group ($\beta = +4.64$ /SD). The bone-procedure group demonstrated the greatest adjusted Δ DASH improvement.

Conclusions: Among preoperative psychological variables, CSI and SDS were independently associated with poorer functional improvement after upper-limb surgery, and the magnitude of these associations differed by diagnostic group. CSI exhibited particularly strong negative effects in peripheral nerve disorders, tendon/ligament injuries, and osteoarthritis. Although PCS did not influence outcomes in the overall model, it demonstrated opposite directional effects across diagnostic groups, indicating diagnosis-specific psychological profiles. Preoperative identification of patients with elevated CSI, along with targeted pain education and psychological interventions, may help optimize postoperative functional recovery in upper-limb surgery.

A-1042 MANAGEMENT OF POST-TRAUMATIC ELBOW STIFFNESS IN OSTEOGENESIS IMPERFECTA TYPE I

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Introduction: Olecranon fractures in patients with type I osteogenesis imperfecta (OI) have an incidence of approximately 13.5%, most commonly resulting from spontaneous triceps avulsion (65%) and showing a high rate of bilaterality (40–100%). Bone fragility influences treatment selection, with tension band wiring being the most favorable option compared with other fixation methods. Nevertheless, secondary articular complications may compromise elbow mobility even after proper fracture consolidation.

Aim: To present the diagnostic and therapeutic management of a case of severe elbow stiffness and secondary chondromatosis following olecranon fracture treated with tension band wiring in a young patient with type I OI.

Material & Methods: We describe the case of a 16-year-old patient with type I OI and a history of a previous contralateral olecranon fracture. The patient sustained a traumatic olecranon fracture initially treated with tension band wiring. Twelve months later, the hardware was removed; however, the patient developed significant functional impairment with a 40° extension deficit and full flexion.

Radiographs demonstrated elbow osteoarthritis with chondromatosis. CT revealed persistent osteochondral defects of the humeral capitellum and radial head, irregular articular surface of the olecranon, multiple osseous fragments in the coronoid process, osteophytic proliferations of the humerus, ulna, and radius, and multiple calcified chondromas up to 14 mm. Based on these findings, open arthrolysis, ulnar nerve transposition, and removal of ventral and dorsal loose bodies were performed.

Results: Surgery resulted in a substantial improvement in the range of motion, achieving an intraoperative extension deficit of only 5° with preserved full flexion. The removal of loose bodies and articular regularization helped optimize joint space and reduce mechanical restriction. No neurovascular complications occurred following ulnar nerve transposition. Conclusions: Patients with type I OI present a high risk of bilateral olecranon fractures and are prone to complications

related to osteosynthesis and abnormal bone remodeling. Tension band wiring remains the treatment of choice due to its superior biomechanical performance in fragile bone. However, the development of stiffness, early osteoarthritis, and chondromatosis may require secondary surgical intervention.

Open arthrolysis combined with loose body removal and ulnar nerve transposition is an effective approach for restoring elbow mobility in complex cases, allowing for meaningful functional improvement even in patients with the structural bone abnormalities characteristic of OI.

A-1043 DOES SECONDARY ISCHAEMIA TIME AFTER FAILED DIGIT REPLANTATION PREDICT SURVIVAL?

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Introduction: Early identification of circulatory impairment after digit replantation/revascularization and prompt restoration of blood flow are considered critical for successful salvage. While the effects of primary ischaemia time on the survival of replanted digits have been studied, evidence regarding the importance of secondary ischaemia duration following failed replantation is limited.

Aim: This study aimed to assess the duration of secondary ischaemia in replanted/revascularized digits with postoperative arterial impairment that were subsequently revascularised by reoperation, and to determine whether secondary ischaemia time correlates with digit survival.

Material & Methods: We identified replanted/revascularized digits reoperated for isolated arterial thrombosis during their primary admission at the National Unit for Replantation Surgery in Norway from 2010 to 2024. Ischaemia onset was defined as a decrease in surface skin temperature of 1°C per hour or 1.5°C over two hours. Data on the onset of ischaemia, time to reestablishment of arterial circulation, and survival were extracted from an internal quality registry. Well known predictors for survival following digit replantation were also collected to control for confounding variables. We conducted binary logistic regression and compared mean secondary ischaemia times between the survival and non survival groups using t-test.

Results: A total of 59 digits with circulatory impairment were reoperated for isolated arterial thrombosis. The salvage rate was 56% (n = 33); the remainder (n = 26) underwent amputation due to necrosis. The survival and non-survival groups were similar with respect to confounding variables. Logistic regression did not identify secondary ischaemia time as a predictor of survival (p = 0.25). The average secondary ischaemia time for salvaged digits was 6.4 hours (95% CI: 5.5–7.3), compared to 7.4 hours (95% CI: 5.8–9.0) for non-salvaged digits (p = 0.25). One digit was salvaged after 15.5 hours of secondary ischaemia.

Conclusions: Digit replantations and revascularizations with postoperative ischaemia due to arterial occlusion appear to tolerate extended secondary ischaemia times. Our study did not find secondary ischaemia from arterial thrombosis to be a critical predictor for salvage. Evidence of a definitive critical secondary ischaemia threshold remains lacking.

A-1044 RISK FACTORS FOR CARPAL OSTEOARTHRITIS AND WRIST SALVAGE PROCEDURES AFTER A PERILUNATE INJURY

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Introduction: Perilunate injuries are severe high-energy wrist injuries frequently resulting in wrist osteoarthritis (OA), and a subset of patients eventually have salvage wrist surgery. Knowledge of variables associated with OA and salvage surgery can improve prognostication, and – if modifiable – might improve treatment.

Aim: Therefore we asked: (1) Which variables are independently associated with the development of radiographic wrist OA following a perilunate injury? (2) Which variables are independently associated with any wrist arthroplasty following a perilunate injury? (3) Which variables are independently associated with the development of volar or dorsal intercalated segment instability (VISI/DISI) and scaphoid fracture nonunion?

Material & Methods: We performed a retrospective cohort study of surgically treated perilunate injuries between 2009 and 2024 at a regional level 1, quaternary care, academic medical center. Patients were included if they had: (1) postoperative radiographs within two months after surgical repair; and (2) radiographs more than one year after injury. Demographic data, injury patterns, operative details, adverse events, and time since injury were collected from medical records. Radiographic outcomes included the presence of OA, VISI/DISI, ulnar translocation, scapholunate widening, and scaphoid fracture nonunion.

Fifty-two patients met the inclusion criteria, with a mean age of 31 years (range 24–38) at the time of injury. Radiographs were available at a median of 26 months (range 14–51) after injury. Thirty-three patients (63%) had a scapholunate interosseous ligament (SLIL) rupture, 32 (62%) a lunotriquetral interosseous ligament (LTIL) rupture, and 29 (56%) had a scaphoid fracture. The SLIL was repaired in 26 patients (79%) and the LTIL in 23 patients (72%). Thirty-six patients (74%) developed radiographic wrist osteoarthritis, and ten patients (19%) had any wrist arthroplasty or salvage procedure. Midcarpal arthrosis was the most common pattern (71%). Eleven patients (22%) developed a DISI deformity and no patients developed a VISI deformity. Scaphoid fracture nonunion occurred in 7 patients (14%).

After bivariate analyses, variables with a p-value <0.10 were entered into multivariable logistic regression models.

Results: Only a greater number of K-wires used was independently associated with the development of OA (OR=2.0, 95%CI 1.1 to 3.5 CI, p=0.019), but our model only accounted for a small amount of the variation (pseudo R² 0.26). Older age (OR=1.2, 95%CI 1.0 to 1.4, p=0.006) was independently associated with having any wrist arthroplasty procedure (pseudo R² 0.59). No variables were independently associated with the development of DISI or scaphoid nonunion. No patients developed VISI, despite 9 (28%) patients having an unrepaired LTIL injury.

Conclusions: Wrist arthritis after perilunate injury is common, but salvage surgery is relatively uncommon, suggesting a substantial portion of people accommodate to degenerative changes. We suspect that the greater number of k-wires is a surrogate for injury severity, and may therefore be associated with a slightly greater odds of developing wrist OA. The lack of variables associated with OA complicate determining specific avenues to improve treatment. Our findings question the presumed association between LTIL disruption and the development of VISI.

A-1045 EVALUATING DISTANCE MAPPING METHODS FOR CONTACT SURFACE AREA AND INTERBONE DISTANCE MEASUREMENT IN 3D-CT IMAGING OF THE WRIST

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Introduction: Accurate assessment of wrist joint congruency and cartilage integrity are essential for detecting osteoarthritis. Distance mapping in 3D and 4D CT provides a non-invasive way to quantify local bone-to-bone distances and contact surface areas across entire joint surfaces. A contact surface area can be defined by applying thresholds for distance and angle between surface normal vectors of adjacent bones. However, studies vary in how distance maps are generated and how contact regions are selected, particularly regarding these distance and angle thresholds. This lack of methodological consistency complicates comparison across studies and the impact of the chosen method and thresholds remains unclear.

Aim: The aim of this study was to evaluate four distance mapping methods for selecting wrist joint contact surface areas and measuring inter-bone distances, and to determine which method shows the lowest sensitivity to variations in distance and angle thresholds. The objective was to find the approach that provides the most consistent contact-surface areas and inter-bone distances.

Material & Methods: We analyzed 3D-CT derived mesh models of twenty healthy wrists and eleven pathological wrists with scaphoid nonunion. Bone meshes of the scaphoid, lunate, and distal radius were segmented and extracted in the neutral wrist position for standardized analysis. Distance maps were generated for three joints: radioscaphoid, radiolunate, and scapholunate. Four distance mapping approaches were compared: nearest neighbor with a distance threshold (NN-D), perpendicular neighbor with a distance threshold (PN-D), nearest neighbor with distance and angle thresholds (NN-DA), and perpendicular neighbor with distance and angle thresholds (PN-DA). Distance thresholds of 2 to 6 mm and angle thresholds of 15 to 90 degrees were evaluated. Contact surface area was defined as the region in which inter-bone distance and, when applicable, angular orientation met the threshold criteria. Mean inter-bone distance was calculated within this region. Sensitivity measures for contact surface area and mean distance were used to evaluate the robustness of these parameters to changes in distance and angle thresholds. A mixed effect model tested differences in sensitivity between methods.

Results: Across all joints and wrist types, contact surface area increased with higher distance thresholds. The NN-based methods consistently produced larger contact regions than the PN-based methods. Adding an angle threshold reduced the contact area. The PN-DA method showed the lowest sensitivity to threshold variation, with the relative change in contact area approaching zero at distance thresholds of 5 to 6 mm and angle thresholds of 75 to 90 degrees. Similar patterns were found for mean inter-bone distance, with PN-DA yielding smaller and more stable distance values. Differences between healthy and pathological wrists did not alter these trends.

Conclusions: The choice of distance-mapping method strongly influences measured contact areas and inter-bone distances. Among all approaches, PN-DA produced the most stable results across threshold settings. Its low sensitivity to threshold variation makes it a strong candidate for standardization, and broader adoption could improve comparability across studies.

A-1046 ATYPICAL SPIRAL TAMAI II THUMB NEAR-AMPUTATION: EXPERIENCE ON USING A MODIFIED REPLANTATION STRATEGY FOR COMPLEX INJURY

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Introduction: Traumatic thumb amputations represent a functionally significant injury, and replantation is indicated and remains the preferred reconstructive option when feasible. The order of repair typically starts with bony stabilization, followed by repair of the tendon and neurovascular bundle and finally, skin closure.

Aim: This report describes our experience of managing a spiral-type Tamai II thumb near-amputation where key on-table decisions and modifications had to be made to the routine operative sequence due to the challenges posed by the unique pattern of injury.

Material & Methods: A 31-year-old right-hand-dominant construction worker sustained a near amputation of the right thumb from an electric saw while cutting pipes. The injury resulted in destruction of the interphalangeal joint (Tamai zone II), contamination with grit, and disruption of both neurovascular bundles. Only a narrow 1-cm spiral, helix-shaped skin bridge remained between the stump. Not only was it insufficient for arterial inflow, but also reattaching the distal phalanx would cause the skin flaps to close in a cork screw pattern that occluded the volar cut critical structures. These unique challenges necessitated repair of the neurovascular bundle first, which also required attention to prepare long limbs to prevent kinking during the spiral skin flap inset. Prior to bony stabilization, the distal stump and its attached skin bridge was rotated in a clockwise fashion to allow accurate approximation of the skin and bony edges to the best extent which did not kink the neurovascular bundle repair. 2 divergent Kirschner wires were inserted.

Operative steps included debridement, shaping of the bone, and fixation using two divergent 1-mm K-wires. Under microscopic visualization, the ulnar digital artery and nerve were repaired with 10-0 nylon, followed by repair of the radial digital nerve. Two dorsal veins of suitable caliber were anastomosed. Residual soft tissues causing compression risk were excised, and the ulnar neurovascular bundle was dissected to adequate length to permit 180° rotation without kinking. Tendons, which were markedly retracted, were not repaired during the procedure. Postoperatively, the patient was monitored closely for vascular integrity.

Results: In the immediate postoperative period, the thumb remained pink with brisk capillary refill, had good turgor, and remained clean without any infection. The overall digital viability was maintained throughout the subsequent follow up reviews.

Conclusions: This report highlights how the unusual spiral-type Tamai II thumb near-amputation necessitated critical on-table decision-making and deviation from the routine operative sequence. The combination of severe contamination, a narrow non-arterial skin bridge, and the spiral soft-tissue disruption required tailored modifications. Early postoperative outcomes demonstrated a viable, infection-free replant, underscoring the importance of flexibility and intra-operative judgment when managing atypical amputation configurations where standard replantation algorithms may not suffice.

A-1047 OUTCOMES OF LUNATE PROSTHESIS, PROXIMAL ROW CARPECTOMY, STT ARTHRODESIS, SC ARTHRODESIS, AND CONSERVATIVE TREATMENT IN KIENBÖCK'S DISEASE: A META-ANALYSIS

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Introduction: Kienböck's disease disrupts the balance of the wrist. As a rare disorder, convincing studies on different treatment options are underpowered or even lacking.

Aim: This is the first meta-analysis to critically compare and evaluate the outcomes of lunate prosthesis, proximal row carpectomy (PRC), scapho-trapezio-trapezoid (STT) arthrodesis, scapho-capitate (SC) arthrodesis, and conservative treatment in advanced Kienböck's disease.

Material & Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA guidelines. PubMed and previous reviews were searched for peer-reviewed publications until November 2025. We included patients with Kienböck's having undergone anatomical lunate prosthetic replacement, PRC, STT arthrodesis, SC arthrodesis, or conservative treatment. No restrictions on date, language, or design were imposed. We excluded inseparable aetiologies or therapies, as well as single case reports. Primary outcomes were pre- and post-operative pain on any scale, arc of motion, and grip strength. Secondary outcomes were functional scores (DASH, Mayo Wrist), complication rates, and revision surgeries. Individual participant data and longest follow-up were used wherever possible. Effect sizes were calculated by Cochrane's Review Manager via pooled mean differences or standardised mean differences and their respective 95% confidence intervals (CI).

Results: Of 100 reports on 1,680 wrists in qualitative synthesis only 58 reports on 937 wrists could be included in meta-analysis because of insufficient or incomparable data. The SC arthrodesis was supported by the most robust sample size ($n = 447$). Pain was significantly relieved by all procedures (lunate prosthesis $-3.8/10$ on the numeric rating scale, 95% CI $-0.1/10$ to $-7.5/10$, $n = 25$ wrists; PRC $-5.1/10$, 95% CI $-2.8/10$ to $-7.5/10$, $n = 79$; STT arthrodesis $-5.5/10$, 95% CI $-2.6/10$ to $-8.3/10$, $n = 106$; SC arthrodesis $-4.4/10$, 95% CI $-3.5/10$ to $-5.4/10$, $n = 377$). Range of motion was not significantly affected by any of the procedures. However, the lunate prosthesis proved to maintain the best extension–flexion arc and isolated extension ($+8^\circ$, 95% CI -2° to $+18^\circ$, $n = 35$). Meanwhile, the STT arthrodesis tended to diminish most severely the radial–ulnar arc (-7° , 95% CI -21° to $+8^\circ$, $n = 92$). Grip strength was significantly increased by all procedures. Functional scores improved consistently.

Conclusions: This is the first meta-analysis to investigate different surgical options compared to conservative treatment in advanced Kienböck's disease. All of them are effective in alleviating pain and strengthening grip. The anatomical lunate prosthesis seems best in preserving extension and in restoring balance to the wrist. The low-level evidence (IV) is due to mostly retrospective case series. There is a need for more usable data to corroborate our results.

A-1048 CLINICAL OUTCOMES OF VOLAR PLATE FIXATION AND DYNAMIC EXTERNAL FIXATION FOR DORSAL PIP JOINT FRACTURE-DISLOCATIONS EVALUATED BY CT ANALYSIS

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Introduction: The aim of this study was to investigate the relationship between fragment size measured on preoperative CT and postoperative outcomes of volar plate fixation (VP) and dynamic external fixation (EF) for dorsal fracture-dislocations of the proximal interphalangeal (PIP) joint.

Materials and Methods: From April 1, 2010 to March 31, 2025, patients who underwent surgical treatment for dorsal PIP joint fracture-dislocations with available preoperative CT were included. Thirty-two fingers treated with volar plate fixation (VP group) and 13 fingers treated with dynamic external fixation (EF group) were analyzed. Fragment size was measured on CT, and radiographic and functional outcomes were compared between the two groups.

Results: There were no significant differences in baseline characteristics such as age, sex, injured finger, hand dominance, or medical history. The time from surgery to initiation of motion and the total follow-up duration were also comparable. Preoperative CT evaluation demonstrated no significant differences in the size of impacted fragments or volar fragments;

however, comminution of the volar fragment was significantly more frequent in the VP group (23 cases) than in the EF group (5 cases). Radiographically, no significant differences were observed between groups regarding re-impaction, redislocation, or the degree of post-traumatic arthritic changes. Displacement of the volar fragment during follow-up occurred in 2 cases in the VP group and 4 cases in the EF group, showing a higher tendency in the EF group. Clinically, the final PIP joint range of motion did not differ significantly between groups. The VP group achieved 93.0° of flexion and -14.5° of extension, while the EF group achieved 84.6° of flexion and -10° of extension. Pain complaints were minimal in both groups. One case of superficial infection was observed in the VP group, which resolved with oral antibiotics.

Discussion: Previous literature has suggested that volar plate fixation is more suitable for large, minimally comminuted volar fragments. However, Watanabe et al. reported favorable outcomes using volar buttress plating even for small fragments. In the present study, patient characteristics and fragment sizes were comparable between groups. Although volar fragment comminution was more common in the VP group, volar fragment displacement after surgery was less frequent in the VP group than in the EF group. These findings support the report by Watanabe et al. and indicate that volar plate fixation can be an effective option even in cases with small or comminuted volar fragments.

A-1049 INTRAOPERATIVE INTRANEURAL PLASMA-RICH GROWTH FACTOR (PRGF) ENHANCES FUNCTIONAL AND ELECTROPHYSIOLOGICAL RECOVERY AFTER CARPAL TUNNEL RELEASE IN SEVERE CARPAL TUNNEL SYNDROME: A PROSPECTIVE COMPARATIVE STUDY

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Introduction: Severe carpal tunnel syndrome (CTS) often leads to incomplete functional recovery despite surgical decompression, due to chronic intraneural fibrosis and axonal loss that persist after release. Restoring neurofunctional balance between sensory and motor components of the median nerve remains a key challenge. Plasma rich in growth factors (PRGF), an autologous, leukocyte-free plasma derivative, provides a fibrin scaffold and sustained release of neurotrophic mediators that may enhance neural regeneration.

Aim: To evaluate whether intraoperative PRGF applied both intraneurally and perineurally improves pain, function, and electrophysiological recovery after carpal tunnel release (CTR) in patients with severe CTS.

Material & Methods: A prospective, evaluator-blinded, two-center comparative study was conducted in 100 patients with severe idiopathic CTS. Participants were allocated to CTR alone (Control) or CTR + intraoperative PRGF according to institutional availability and patient acceptance. PRGF was prepared autologously following a standardized protocol and applied intraoperatively as a 3 mL intraneural injection plus a perineural fibrin membrane. Blinded clinical, ultrasound, and electrophysiologic assessments were performed at 3, 6, and 12 months. Outcomes included VAS pain, BCTQ (SSS/FSS), pinch and grip strength, PGIC, pillar pain, median nerve cross-sectional area (CSA), and nerve conduction parameters (SCV, DSL, MCV, DML, denervation score). Statistical comparisons used mixed-model ANOVA and independent t-tests ($p < .05$). Results: Ninety-six patients completed 12-month follow-up. The PRGF group showed greater VAS reduction (-3.5 ± 1.0 vs -2.3 ± 1.1 ; $p < .01$) and lower analgesic burden (8.6 ± 3.5 vs 17.2 ± 5.9 ; $p < .001$). Functional improvement was superior with PRGF in both BCTQ-SSS (-1.4 ± 0.6 vs -0.9 ± 0.7) and FSS (-1.3 ± 0.5 vs -0.8 ± 0.6 ; both $p < .01$). Pinch and grip strength gains at 12 months were greater in the PRGF group ($+3.8 \pm 1.1$ kg and $+9.0 \pm 2.4$ kg) than controls ($+2.1 \pm 1.0$ kg and $+6.2 \pm 2.7$ kg; $p = .03$ and $.02$). PGIC scores were higher (4.1 ± 0.7 vs 3.2 ± 0.8 ; $p < .01$), and pillar pain resolved more frequently (80% vs 58%; $p = .01$). Electrophysiological recovery was greater with PRGF: SCV $+5.8 \pm 1.3$ vs $+3.5 \pm 1.2$ m/s, DSL -1.4 ± 0.3 vs -0.8 ± 0.4 ms, MCV $+4.7 \pm 1.2$ vs $+2.9 \pm 1.0$ m/s, DML -1.1 ± 0.4 vs -0.6 ± 0.3 ms (all $p <$

.01). Denervation scores remained unchanged. Median nerve CSA decreased more in the PRGF group ($-3.2 \pm 1.1 \text{ mm}^2$ vs $-1.4 \pm 0.9 \text{ mm}^2$; $p = .01$). No serious adverse events were reported.

Conclusions: Intraoperative intraneural and perineural PRGF as an adjunct to open CTR significantly enhanced pain relief, motor recovery, and electrophysiological conduction in severe CTS. The technique restores functional balance of the decompressed median nerve by combining mechanical release with biological regeneration. It is safe, reproducible, and easily integrated into standard surgical workflow.

A-1050 THE VASCULARIZED THUMB METACARPAL PERIOSTEAL FLAP FOR COMPLEX SCAPHOID NONUNION: RESULTS OF 102 CONSECUTIVE CASES AND PROGNOSTIC FACTORS FOR FAILURE

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Introduction: Scaphoid nonunion with proximal pole necrosis, chronic evolution, or previous failed surgery remains a major reconstructive challenge. Vascularized bone grafts improve healing but are technically demanding and associated with donor-site morbidity. The vascularized thumb metacarpal periosteal flap (VTMPF) offers a technically simpler, biologically active alternative by combining osteogenic and angiogenic potential within a pliable periosteal layer. This study presents the largest prospective series to date of VTMPF in adults with complex scaphoid nonunion and identifies prognostic factors for failure.

Aim: To evaluate clinical and radiological outcomes of VTMPF in adult complex scaphoid nonunion and to determine the prognostic combinations associated with failure.

Material & Methods: From January 2015 to April 2024, 102 adult patients (≥ 18 years) with scaphoid nonunion and at least one poor prognostic factor (Herbert D3/D4, chronic evolution > 5 years, or previous failed surgery) were prospectively treated with VTMPF at four hand surgery centers. The flap was harvested from the dorsum of the thumb metacarpal on the first dorsal metacarpal artery and fixed using one or two bone anchors. Cancellous bone graft was added in all cases. Functional and radiological follow-up included VAS, QuickDASH, MMWS, ROM, grip/pinch strength, scapholunate (SL) and radiolunate (RL) angles, and CT evaluation for cross-sectional trabecular bridging (CSTP). Union was defined as $> 50\%$ CSTP. Subgroup analysis was performed according to the number and type of prognostic factors.

Results: The cohort included 72 men and 30 women (mean age 39 ± 9 years, mean follow-up 32 months). Bone union occurred in 98 of 102 patients (96.1%). Those with a single prognostic factor achieved 100% union (59/59), while those with two (31/34, 90.3%) or three (11/12, 91.7%) had lower success rates ($p < .05$). All four nonunions occurred in patients combining previous failed surgery and proximal pole necrosis (Herbert D3/D4). Mean CSTP was $73\% \pm 10$ at 12 weeks. Pain improved markedly (VAS $7.8 \rightarrow 1.2$ at rest, $9.5 \rightarrow 2.3$ on activity), with QuickDASH improving from 34.8 to 7.9 and MMWS from 65.1 to 94.2. Grip and pinch strength recovered to $> 94\%$ of the contralateral side, and ROM improved by 24° . SL and RL angles normalized ($69^\circ \rightarrow 53^\circ$, $18^\circ \rightarrow 4^\circ$), with no carpal collapse or donor-site morbidity.

Conclusions: The VTMPF provides a safe, effective, and reproducible solution for complex scaphoid nonunion, achieving $> 96\%$ union and excellent functional recovery. However, the combination of previous failed surgery and proximal pole necrosis represents a high-risk subgroup with reduced consolidation rates. Proper selection of indications and early recognition of unfavorable factor combinations can optimize surgical outcomes and restore functional balance of the wrist through biological regeneration rather than structural substitution.

A-1051 WHEN TEAMS ALIGN, PATIENTS IMPROVE: THE POWER OF AN INTEGRATED CRPS PROTOCOL

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Introduction: Complex Regional Pain Syndrome (CRPS) is a challenging pain condition characterised by sensory, autonomic and motor alterations. Despite standardized diagnostic criteria, its clinical course and therapeutic response remain heterogeneous. In 2023, our hospital introduced a new interdisciplinary CRPS protocol, developed jointly by Rehabilitation, Occupational Therapy, the Upper Limb Unit and Anesthesia, aimed at standardising early diagnosis and coordinated treatment. Evidence on its real-world impact is still limited.

Aim: To describe clinical, functional and neuropathic pain evolution in patients diagnosed with CRPS and to assess the impact of the newly implemented interdisciplinary protocol one year after its introduction.

Materials & Methods: A retrospective observational study was conducted including all patients diagnosed with CRPS under the new protocol ($n=10$). Variables included Budapest criteria, DN4, corticosteroid and gabapentin use, type of precipitating injury, anxious–depressive symptoms and pain evolution (EVA) at baseline, 9 and 12 months.

Results: The cohort included 10 patients treated after implementation of the interdisciplinary protocol. Women represented 90% of the sample, with a mean age of 55.80 years (SD 10.76). Precipitating events included fractures (50%), carpal tunnel syndrome (30%) and rhizarthrosis (20%). Anxious–depressive symptoms were present in 50% of patients.

At diagnosis, five patients met Budapest criteria, three were classified as CRPS-NOS and one did not meet criteria. At one year, three patients remained Budapest-positive; these were also the individuals referred to the Pain Clinic, where they received axillary ganglion, stellate ganglion or supraclavicular blocks. Five patients were negative for Budapest criteria at one year.

All patients received corticosteroids, and gabapentin was administered in 88.9% of valid cases. DN4 improvement was greater in gabapentin users (mean reduction of 4 points) compared with non-users (2 points), although differences were not statistically significant. QuickDASH values tended to be higher in cases associated with rhizarthrosis, reflecting greater functional limitation.

The precipitating injury (STC, fracture or rhizarthrosis) showed no significant association with pain or QuickDASH outcomes, although STC cases demonstrated a trend toward higher disability ($p=0.069$). Anxious–depressive symptoms did not significantly influence EVA or DN4 evolution, and no associations were found between age, Budapest category or Pain Clinic referral and symptom improvement.

Pain improved significantly from baseline to 9 months (median reduction of 5 points; $p=0.017$) and further at 12 months ($p=0.011$). DN4 also decreased significantly (median 5.43 to 1.71; $p=0.018$). B-CPRS-BDS scores and QuickDASH both showed significant improvements (mean reductions of 12.60 to 7; $p=0.04$ and approximately 40 points; $p=0.018$, respectively). One year after protocol implementation, the cohort demonstrated consistent and meaningful reductions in pain, neuropathic features and functional disability, with no single variable clearly predicting differential response.

Conclusions: Implementation of an interdisciplinary CRPS protocol resulted in significant improvement in pain and neuropathic symptoms at 9 and 12 months. No demographic or clinical factor—including Budapest criteria, injury type or psychological symptoms—was associated with different evolution patterns, highlighting the heterogeneity of CRPS. These findings support protocol-based multidisciplinary management and the need for larger prospective studies to refine prognostic indicators and optimise treatment pathways.

A-1052 THE EXTENDED MEDIAL FEMORAL CONDYLE FLAP: ANATOMICAL STUDY OF PERIOSTEAL VASCULAR TERRITORIES AND CLINICAL APPLICATION IN COMPLEX UPPER-LIMB NONUNIONS

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Introduction: The vascularized medial femoral condyle (MFC) flap, based on the descending genicular artery (DGA) and its anastomoses with the superomedial genicular artery (SMGA), is a reliable source of corticoperiosteal bone for recalcitrant nonunions. Previous anatomical studies have described consistent periosteal networks along the distal femur. However, the precise limits of periosteal vascularization and its potential safe extension beyond the classic osteoperiosteal boundaries remain incompletely defined. Expanding the periosteal component could increase flap versatility while reducing the risk of femoral fracture associated with harvesting larger cortical segments.

Aim: To delineate the vascular territories of the DGA and SMGA supplying the distal femoral periosteum through latex injection in cadaveric specimens, and to assess the feasibility and clinical outcomes of using an extended periosteal-augmented MFC flap for complex upper-limb nonunions.

Material & Methods: Ten fresh cadaveric lower limbs were injected with colored latex into the DGA and SMGA. Under magnification, the continuity, overlap, and anastomotic patterns of periosteal perfusion were mapped on the medial distal femur. The maximal continuous area of viable periosteum was delineated and its relationship with the cortical surface and adductor insertion recorded. Based on these anatomical findings, six clinical cases (four humeral, one radial, one ulnar) of atrophic or infected nonunion were reconstructed using an osteoperiosteal MFC flap with an enlarged vascularized periosteal component. Postoperative follow-up included serial radiographs and CT to confirm bone union and donor-site evaluation for complications.

Results: Latex injection demonstrated consistent and overlapping periosteal networks between the DGA and SMGA in all specimens, allowing safe anterior and distal extension of the vascularized periosteum beyond the traditional MFC limits. The continuous perfused periosteal surface averaged approximately $40 \pm 5 \text{ cm}^2$ (range 32–48 cm^2). Anastomotic connections between longitudinal and transverse branches of the DGA were constant, and perfusion extended to the medial trochlear margin without cortical compromise. Clinically, all six flaps survived completely. Bone union occurred in all cases within 10–14 weeks, and no donor-site fractures, knee pain, or sensory disturbances were observed. The extended periosteal component facilitated adaptation to irregular bone surfaces and increased the contact area at the recipient site.

Conclusions: The extended MFC flap, supported by the dual vascular network of the DGA and SMGA, allows safe harvest of a larger periosteal surface in continuity with the osseous segment. This modification expands the reconstructive versatility of the classic MFC flap for complex upper-limb nonunions, preserving femoral integrity and minimizing morbidity. These findings corroborate and extend previous anatomical descriptions, providing a biologically rational framework for future biomechanical and clinical studies.

A-1054 BIOMECHANICAL PERFORMANCE OF GRASP-AND-LIFT TASKS IN TYPICALLY DEVELOPING CHILDREN AGED 5–12 YEARS

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Introduction: Grasp-and-lift is a fundamental hand function frequently used in daily activities. Successful performance relies on adequate force modulation supported by sensorimotor coordination. However, limited research has examined the biomechanical aspects of grasp-and-lift performance in the pediatric population.

Aim: This study used the Pinch Holding-Up Activity (PHUA) test to evaluate grasp-and-lift biomechanics in typically developing children aged 5–12 years and to determine whether performance differs by age or gender.

Materials & Methods: Twenty-five typically developing, right-handed children aged 5–12 years (male: female = 7:18) participated. Children scoring below the 15th percentile on the MABC-2 were excluded. Participants were divided into two age groups: (1) 5–7 years 11 months ($n = 15$) and (2) ≥ 8 years ($n = 10$). All participants completed five PHUA trials. The PHUA device (125 g, $6 \times 3.65 \times 3.65$ cm) incorporates two single-axis load cells (SLB-25; Transducer Techniques) and a triaxial accelerometer (Model 2412; Silicon Designs, Inc.) to quantify pinch and load forces. Independent t-tests were used to compare biomechanical parameters across age and gender.

Results: For each participant, Mahalanobis distance was used to identify the trial closest to the median response to reduce within-subject variability and outlier influence. A sensitivity analysis further extracted four trials that best represented each participant's typical performance, and these were used for subsequent analysis.

No significant age-related differences were found across all PHUA variables, including Peak Pinch Force ($t = -1.590$, $p = .126$), Maximal Load Force ($t = -0.927$, $p = .364$), Force Ratio ($t = -1.577$, $p = .128$), Baseline Pinch Force ($t = -1.250$, $p = .224$), and Normalized Peak Pinch Force ($t = -1.037$, $p = .326$).

Similarly, gender comparisons showed no statistically significant differences. Boys and girls demonstrated comparable performance in Peak Pinch Force ($t = -1.330$, $p = .197$), Maximal Load Force ($t = 1.504$, $p = .146$), Force Ratio ($t = -1.366$, $p = .196$), Baseline Pinch Force ($t = -1.731$, $p = .097$), and Normalized Peak Pinch Force ($t = 1.063$, $p = .328$).

Conclusions: Typically developing children aged 5–12 years did not exhibit age- or gender-related differences in grasp-and-lift biomechanics. These findings suggest that functional force modulation during grasp-and-lift tasks may reach a relatively mature and stable level by approximately five years of age. The results provide foundational data for understanding the development of hand motor control in children. Future studies with larger samples and broader age ranges, including younger children or adults, are warranted to further clarify developmental trajectories in grasp-and-lift performance.

A-1055 EVALUATING PNEUMATIC TOURNIQUET PRACTICE IN HAND SURGERY: AN AUDIT OF SAFETY, DOCUMENTATION AND GUIDELINE COMPLIANCE

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Introduction: Tourniquets are commonly used in hand surgery to create a bloodless operative field, improving visibility and facilitating precise dissection. However, improper use or prolonged application can lead to serious complications,

including nerve injury, tissue necrosis, and thrombotic events. The BOA and BSSH guidelines stress that their use must be both judicious and well-documented to ensure patient safety.

Aim: To assess compliance with BOA and BSSH guidelines on the safe use of pneumatic tourniquets in hand surgery and to evaluate the impact of a documentation-focused quality improvement intervention.

Method: A retrospective audit of all upper limb procedures performed under tourniquet control in April 2025 was undertaken in a single plastic surgery unit. Data collected included patient demographics, procedure type, infection and VTE risk, and tourniquet-specific variables (site, time, pressure, skin condition pre/post, exsanguination method). After the analysis an electronic SmartPhrase (a pre-formatted text shortcut) was then introduced into the e-notes system to prompt comprehensive documentation. The findings and intervention was presented in a local meeting. Finally, data was once again collected using the same parameters after the introduction of the smartphrase.

Results: In April we found 44 procedures that used pneumatic tourniquets. The date we collected showed, that tourniquet time was documented in 100% of cases, but pressure was recorded in only 20%, site in 77%, and neither skin condition nor exsanguination method were documented. Which meant we were not compliant with national guidelines, putting patients at greater risk for tourniquet related complications.

Following the SmartPhrase intervention, the new data collected demonstrated the following improvements: pressure documentation increased to 49%, site to 84%, skin condition to 26%, and exsanguination to 23%. Time documentation remained at 100%. However, the SmartPhrase did not incorporate systolic BP prompts for individualised pressures, and exsanguination continued in some cases with high VTE/infection risk cases.

Conclusions: In conclusion the SmartPhrase intervention improved documentation across multiple safety-critical parameters in tourniquet use, supporting better compliance with national guidelines. Nevertheless, further refinement is needed to include systolic BP-based pressure prompts and decision aids to guide exsanguination practice in higher-risk patients. Embedding these refinements, coupled with ongoing education and re-audit, has the potential to optimise both documentation and patient safety in hand surgery.

A-1056 OPERATIVE VERSUS NON-OPERATIVE MANAGEMENT OF FIFTH METACARPAL FRACTURES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Fifth metacarpal fractures are the most frequent metacarpal injuries, commonly affecting young, active adults. Despite their prevalence, the optimal management strategy remains controversial. Options range from non-operative treatment, such as early mobilisation or immobilisation, to surgical fixation with Kirschner wires (K-wires), intramedullary (IM) nails, or plates. The evidence directly comparing these techniques remains inconsistent, with no clear consensus on which provides best functional recovery

Aim: This systematic review and meta-analysis aimed to compare functional and strength outcomes between conservative and surgical modalities for extra-articular fifth metacarpal fractures in adults.

Material & Methods: Following PRISMA 2020 guidelines, PubMed, Embase, and Cochrane Library were searched to November 2025. Eligible studies included randomised controlled trials and randomised prospective cohort studies assessing adult patients with closed, extra-articular fifth metacarpal fractures managed by non-operative (splinting, casting, buddy taping, elastic bandage) or operative (K-wire, IM nailing, plating) techniques.

The primary outcome was the Quick Disabilities of the Arm, Shoulder and Hand (qDASH) score. Secondary outcomes

included grip strength, radiographic alignment, time to return to work, and complications. Data extraction was performed independently by two reviewers, and pooled analyses were conducted using a random-effects model to calculate mean differences with 95% confidence intervals (CI).

Results: 12 studies (n = 570 patients) met inclusion criteria.

Non-operative management included early mobilisation (buddy taping/bandage, n = 54) with a mean qDASH of 5.41 ± 4.32 , and immobilisation (splint/cast, n = 233) with a mean qDASH of 8.68 ± 7.96 .

Operative management included K-wire fixation (n = 74) with a mean qDASH of 3.98 ± 3.61 , and plating (n = 18) with a mean qDASH of 15.9 ± 0.0 .

When pooled, the overall mean qDASH difference between surgical and conservative management was -1.76 (95% CI -4.03 to 0.51 ; $p = 0.13$), indicating no statistically significant functional superiority for surgery. Subgroup analysis suggested that early mobilisation achieved comparable functional outcomes to K-wires, and superior results to casting or plating. Complications were more frequent with operative techniques, including pin-site infections, stiffness, and hardware irritation, particularly in K-wire and plating cohorts. Non-operative management showed faster return to work and fewer complications, though radiographs occasionally demonstrated mild residual angulation without functional impairment. Conclusions: This meta-analysis found no significant functional superiority of surgical fixation over non-operative management for most extra-articular fifth metacarpal fractures.

Early mobilisation methods achieved equivalent or superior recovery with fewer complications and shorter rehabilitation compared with surgery or prolonged immobilisation.

Operative treatment should be reserved for unstable, malrotated, or markedly displaced fractures. Future high-quality randomised trials with standardised outcome measures are warranted to refine treatment algorithms.

A-1057 RESTORING FUNCTIONAL BALANCE: OUTCOMES OF SURGERY TO IMPROVE WRIST EXTENSION IN ICSHT-0 AND 1 TETRAPLEGIA

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Introduction and Aims: Restoring a semblance of balanced upper-limb function is a central objective in treatment for individuals with ICSHT-0 tetraplegia, who have lost voluntary movement below the level of the elbow. Surgery aimed at reestablishing wrist extension, such as nerve transfer or tendon transfer surgery, can improve grasp-release mechanics and support greater autonomy. We report on our cohort of patients with tetraplegia of the hand who have undergone surgical intervention, including clinical measurements, patient-reported outcomes, with a specific emphasis on the overarching theme of achieving balance within patients' daily functional capabilities.

Materials and Methods: A retrospective review of 12 patients with ICSHT-0 tetraplegia of the hand, who underwent nerve and/or tendon transfer, or arthrodesis, to restore wrist extension was evaluated at a minimum of 12 months postoperatively. Primary outcomes comprised active wrist extension range of motion, Medical Research Council (MRC) muscle strength grades, and grasp-release performance. Secondary outcomes included patient-reported measures addressing perceived functional balance, symmetry in limb use, and ease of performing everyday tasks. Qualitative comments were analysed thematically to capture the lived experience of restored balance.

Results: All participants achieved an improvement or partial restoration of wrist extension. Enhanced wrist extension translated to notable improvements in grasp-release efficiency. Patient-reported outcomes revealed that these biomechanical gains supported a renewed sense of balance: individuals described improved stability when positioning

the hand, and greater autonomy with daily bodily functions.

Conclusions: Surgery to improve wrist extension in patients with ICS-0 tetraplegia of the hand and wrist yields modest but important improvements in wrist extension and functional grasp-release performance. Patients identified some sense of improved balance— between the two upper limbs, and between intention and action—as a defining outcome of the intervention. Framing postoperative recovery through this lens highlights the holistic value of this surgery in this group of patients.

A-1058 SAFETY AND SHORT-TERM RESULTS OF MINIMALLY INVASIVE CARPAL TUNNEL RELEASE USING A MENISCOTOME AND A CANNULA TROCAR INSTRUMENT

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Introduction: Carpal tunnel release can be performed through either open or endoscopic techniques. At present, the majority of hand surgeons prefer the mini-open technique, which is defined as a skin incision measuring less than 3 centimeters. While some surgeons utilize surgical scissors, others opt for a variety of specialized tools designed to enhance the safety of the procedure. However, a significant drawback of many of these specialized instruments is that they are single-use devices, which increases the overall expense of the surgery. Previously, preliminary results and safety data from fifty patients treated with this novel instrument were presented at the FESSH 2018 meeting. This expanded study, encompasses 150 patients who underwent the procedure at the same medical center between 2019 and 2024

Aim: The primary objective of this study is to describe the surgical method for mini-open CTR using a newly developed, simple cannula-trocar instrument. This device is designed to guide a meniscotome for the carpal tunnel release procedure. The study also aims to further evaluate the safety and efficacy of the instrument, with a focus on its safety and short-term clinical outcomes.

Material & Methods: We conducted a retrospective chart review. The procedure utilized a newly developed cannula and trocar tool. The instrument consists of two components: a cannula and trocar of 5 mm diameter and 13 cm length, serving as a guide for a meniscotome used for transection of the transverse carpal ligament. 150 patients who underwent the procedure at a single center from 2019 to 2024 were evaluated by the main author in the hand outpatient clinic 2-8 weeks postoperatively for short-term outcomes and complications. Assessment included patient-reported improvement in preoperative symptoms, sensory function evaluated with Semmes-Weinstein Monofilament (SWMF) testing before and after the procedure and abductor pollicis brevis muscle strength assessed manually. The primary focus was on reported sensory loss motor power loss or symptom aggravation, as potential indicators of nerve damage.

Results: More than 85% of patients reported relief from numbness at 2-8 weeks post operation. None reported worsening numbness, as confirmed both by patient reports and sensory evaluation using SWMF, none had deterioration in APB muscle strength

Conclusions: The instrument enabled safe and effective mini-open carpal tunnel release using a meniscotome. The procedure is cost-effective and environmentally friendly due to the reusable nature of the instrument.

A-1059 EFFICACY OF ORTHOTIC MANAGEMENT VERSUS CORTICOSTEROID INJECTIONS FOR TRIGGER FINGER: A SYSTEMATIC REVIEW

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Introduction: Trigger finger is a common condition characterized by pain, stiffness, and locking due to A1 pulley inflammation. While corticosteroid injections are widely accepted as first-line treatment, orthotic splinting is a less frequently used but potentially effective alternative.

Aim: This systematic review aimed to evaluate and compare the effectiveness of corticosteroid injection and splinting in managing trigger finger.

Material & Methods: A systematic review was conducted and registered with PROSPERO (CRD42025636835). PubMed, EMBASE, and Cochrane databases were searched for English-language randomized controlled trials (RCTs) and prospective cohort studies involving adult patients treated with corticosteroid injection and/or splinting. Studies included direct comparisons or evaluated either against a novel treatment. Extracted data included demographics, intervention details, and outcomes. Treatment failure was defined as the need to escalate care. A meta-analysis was performed where appropriate. Risk of bias was assessed.

Results: From 4853 articles searched 188 full text articles were screened and 52 articles included for analysis. 3988 patients and 4717 digits were included. Techniques varied for splinting regime, orthosis type, joints immobilised; and injectate used, injection site, and regime. Outcomes reported varied but including Green's scale and escalation of further treatment. Three prospective comparative studies were included in the meta-analysis of 336 patients. In the meta-analysis 138/180 (76.7%) splinted digits were successfully treated in requiring no further treatment whereas 108/156 (69.2%) injected digits were successfully treated and required no escalation to surgery. Outcomes indicated splinting can reduce symptoms and delay or avoid the need for corticosteroid injection or surgery.

Conclusions: This provides evidence supporting splinting as an effective initial standalone management strategy for mild trigger finger. Based on current evidence, we propose a stepwise algorithm emphasising splinting before invasive treatments.

A-1060 GRAFTING OR DISTAL NERVE TRANSFER TO RESTORE ELBOW FLEXION IN INCOMPLETE ADULT TRAUMATIC BRACHIAL PLEXUS INJURIES

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Introduction: Supra-clavicular adult traumatic brachial plexus injuries (ATBPI) result from forceful widening of the angle between neck and shoulder. In an incomplete ATBPI (Upper Trunk and Extended Upper Trunk lesion) some intact hand function is present. In these lesions most BP specialists initially wait for several months for spontaneous recovery. If elbow flexion is not present at 6 months, the generally preferred technique to restore function is distal fascicular nerve transfers (DFNT). Supraclavicular grafting of C6 has the benefit of reinnervating more targets at once. Since reanimation of elbow flexion is the primary goal of surgery in ATBPI, the outcome of grafting should at least be comparable to that of DFNT before its additional potential advantages can be appreciated.

Aim: We aim to compare different surgical techniques (nerve grafting vs. transfer). Also, we aim to investigate the role of timing within each surgical technique on recovery.

Material & Methods: We performed a retrospective observational study of patients with either a C5, C6 or C5, C6, C7 or C5, C6, C7, C8 lesion type who were surgically treated for ATBPI (2009–2021) with a follow up of 2 years or more. We only included patients operated in one year after trauma. We used the Medical Research Council (MRC) grade of biceps force at last visit as primary outcome of reconstruction.

Results: The cohort contains a total of 84 patients. DFNT surgery was performed more often in patients with smaller lesion extent while for patients with large lesion extent supraclavicular grafting was more often performed. The proportion of MRC 3&4 was similar in the two surgery groups. There was a higher proportion of MRC4 after DFNT surgery compared to supraclavicular grafting surgery. The severity of the lesion is negatively associated with better MRC score. Within the supraclavicular grafting group there is a negative association between delay time and recovery. For each additional month of delay before supraclavicular grafting, the odds of achieving a better MRC recovery category are reduced by 50% (common odds ratio 0.49 (95%CI: 0.29–0.83)). There is not a significant association between delay time and recovery within the DFNT group.

Discussion and Conclusion: The group of patients with severe but incomplete adult brachial plexus injury is heterogeneous. Early DFNT gives a stronger biceps strength than grafting; however, with grafting additional shoulder muscles and C6/C7 dermatomes can be reinnervated. Early supraclavicular brachial plexus exploration facilitates early diagnosis and offers the opportunity to choose for grafting or early DFNT to maximize outcomes.

A-1061 ARE TWO SCREWS BETTER THAN ONE? A SYSTEMATIC REVIEW OF THE LITERATURE OF TWO-SCREW FIXATION OF ACUTE SCAPHOID FRACTURES

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Introduction: Displaced scaphoid fractures have a significant nonunion rate even after surgery. Open or closed reduction and fixation with a headless compression screw is the preferred operative choice, although it is postulated that a single screw may not achieve absolute stability against rotational forces.

Aim: We aimed to evaluate the literature reporting outcomes of acute scaphoid fracture managed with two-screw fixation.

Material & Methods: We performed a prospectively registered (PROSPERO ID: CRD42024524604) systematic review following the PRISMA guidelines for patients undergoing acute scaphoid fracture fixation with two screws. PubMed, Cochrane Library, and Embase databases were queried for studies reporting outcomes from dual screw scaphoid fixation. Two reviewers quality assessed and extracted data. Demographic data, surgical technique, patient reported outcome measures and clinical and radiological follow up results were collected and summarised.

Results: Four studies were eligible for inclusion. One article prospectively compared one- with two-screw fixation; one compared these retrospectively; one compared arthroscopic-assisted two-screw fixation with and without bone graft in acute and non-united fractures; the fourth was not comparative. 152 patients were included, 78 underwent two-screw fixation with a union rate of 100%, compared to 92.2% union in the single-screw group. Two articles included 2-year follow up. Herbert & Fisher type B2 fractures were most common (62.5%). Time to union averaged between 6–10 weeks, shorter for two-screw fixation. Other outcomes included VAS, DASH, PRWE, MMWS, range of motion and grip strength. Two procedure-specific complications were reported following two-screw fixation: one metalwork removal for prominent

screw and one propagated fracture as the second screw was sited, neither affecting outcomes.

Conclusions: Two-screw scaphoid fixation may achieve higher and faster union; with a 100% union rate reported in the literature. It also appears to offer a low complication alternative to single screw fixation. Outcomes are reported inconsistently and prospective larger trials are needed.

A-1062 OUTCOMES FOLLOWING SCAPHOID PROSTHETIC ARTHROPLASTY: A SYSTEMATIC REVIEW

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Introduction: Prosthetic replacement of the fragmented, collapsed, and necrosed scaphoid is a potential treatment for end stage scaphoid disease including non-union with avascular necrosis of the proximal pole, or idiopathic Preiser's disease, a rare and challenging wrist condition.

Aim: This systematic review assesses the effectiveness, safety, and clinical outcomes of prosthetic scaphoid arthroplasty.

Material & Methods: A systematic review was conducted according to PRISMA-P guidelines and registered with PROSPERO (CRD420251004692). Databases searched included Cochrane, PubMed and EMBASE. Studies were included if they reported outcomes of prosthetic scaphoid arthroplasty with a minimum follow-up of 12 months. Primary outcomes were patient-reported outcome measures (PROMs), complications, and re-operations. Secondary outcomes included pain, grip strength, and range of motion. Data on demographics, surgical technique, follow-up, and complications were extracted.

Results: 1,272 articles were identified, 196 duplicates removed, and 25 studies met the inclusion criteria. Five types of prostheses were evaluated silicone, pyrocarbon, acrylic, metal, and 3D-printed implants. Partial and total scaphoid replacements and surgical techniques are evaluated, clinical and radiological outcomes are reported where available and complications data are presented. 582 patients were included in the analysis. Follow up ranged from 3 months to 43 years. Across all prostheses, patients experienced variable pain reduction and functional improvement. Complications include loosening, migration and wear; varying with implant type.

Conclusions: Scaphoid prosthetic arthroplasty remains a technically demanding surgery, although potentially a viable alternative to salvage wrist procedures. The choice of implant material appears to influence complication rates. While modern designs like pyrocarbon and 3D-printed implants show promise, their long-term performance is unproven. Prospective and comparative studies are required to demonstrate efficacy and safety.

A-1063 STRESS SHIELDING AFTER MP/PIP JOINT COLLATERAL LIGAMENT REPAIR USING THE JUGGERKNOT® ALL-SOFT ANCHOR: A RETROSPECTIVE REVIEW OF 17 CASES

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Objective: The purpose of this study was to clarify the incidence and characteristics of stress shielding after collateral ligament repair of the metacarpophalangeal (MP) and proximal interphalangeal (PIP) joints using the Juggernaut® all-soft tissue anchor (Zimmer Biomet).

Materials and Methods: Seventeen patients who underwent MP or PIP joint ligament repair with a Juggernaut® anchor between 2018 and 2025 were included. Radiographic stress shielding was defined as peri-anchor radiolucency and

classified into three grades (0–2) according to its extent. Patients were divided into a stress-shielding group (6 cases) and a non–stress-shielding group (11 cases). Postoperative immobilization period, final range of motion (ROM), pain visual analog scale (VAS), and lateral instability were compared between the groups.

Results: Stress shielding was observed in 6 of 17 cases (35.3%) and appeared 2–3 months postoperatively. The affected patients ranged from 13 to 54 years of age, and five of the six cases were in their teens or twenties, indicating a strong predominance in younger patients. Most patients had no notable pain or ROM limitation, but radiographs revealed widening of the anchor hole in several cases. There were no differences in postoperative immobilization period between the groups, and no case demonstrated lateral instability or anchor pullout.

Conclusion: Younger patients may be more prone to stress shielding because their dense trabecular bone structure allows greater concentration of mechanical stress around the anchor. In this study, stress shielding was frequently observed in younger individuals and presented despite minimal clinical symptoms. These findings highlight the importance of early postoperative radiographic follow-up, even in asymptomatic cases.

A-1064 EXTRADIGITAL MALIGNANT GLOMUS TUMOUR OF THE ARM: CLINICAL AND HISTOPATHOLOGICAL DIAGNOSTIC CHALLENGES

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Introduction: Extradigital glomus tumours are a rare entity, with reports in the literature of less than 30% of cutaneous glomus cases being extradigital.¹ Even more rare are extradigital cutaneous malignant glomus tumours, with less than 50 cases reported in the literature, these tumours can be locally aggressive, can readily metastasise and should be managed by tertiary sarcoma services.² The challenges with clinical diagnosis are the lower rates of presentation of classical glomus triad of symptoms, localized pain, cold sensitivity, and point tenderness and rates of both clinical and histological misdiagnosis particularly when outside of sarcoma centres.^{1,3}

Case report: We present the case of a 74-year-old female who presented initially to dermatology with a 1 year history of an enlarging purplish red nodular lesion on her right upper arm, which bled intermittently. She did not have any pain, tenderness or cold sensitivity associated. She had no history of neurofibromatosis or genetic conditions. She had a history of congenital neuroenteric and hepatic cysts. The initial clinical differential diagnosis included pyogenic granuloma, melanoma, SCC or merkel cell tumour. No preoperative imaging was conducted. This was excised with narrow margins initially under dermatology in a different hospital. Histopathology raised suspicion of an atypical glomus tumour and this was further examined by sarcoma specialist pathologists at a tertiary regional sarcoma centre. This concluded a tissue diagnosis of malignant glomus tumour. CT scan did not demonstrate any metastatic disease. Wider excision was performed, confirming histological clearance. She is currently until clinical and radiological follow-up, 7-months following histological clearance with no sign of recurrence.

Conclusions: This highlights the importance of high index of suspicion in atypical extradigital cutaneous lesions, the need for tertiary level pathological and clinical assessment and surgical excision in sarcoma centres as the current gold standard of treatment remains wide excision with aim for negative margins.

A-1065 EVALUATION AND MANAGEMENT OF DUPUYTREN'S DISEASE BY ARTIFICIAL INTELLIGENCE

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Introduction: Artificial intelligence (AI) provides a valuable tool for both patients and providers by improving access to medical information. However, greater care is needed to discern if the output is reliable especially for relatively common conditions such as Dupuytren Contracture. A study by Unakdat et al. 2025 has shown that from clinical prompts AI, such as ChatGPT, could diagnose Dupuytren's Disease from clinical prompts with greater than 95 percent accuracy; however, Seth et al. 2025 found that treatment recommendation from clinical prompts had about 45 percent agreement with board certified hand surgeons. Further, the utility of AI is limited by the prompts provided by the user. Dupuytren contracture represents a relatively complex condition to describe with accurate detail needed to elicit appropriate diagnostic or management information. An image can provide all these details and bridge this skill gap, yet to date no studies have investigated the ability of AI to recommend treatment for Dupuytren contracture from images alone.

Aim: Our aim was to assess the ability of ChatGPT 5.0 to accurately identify Dupuytren contractures from a single patient-image and subsequently recommend appropriate treatment in comparison to that of board certified hand surgeons.

Material & Methods: A set of 46 images were obtained from publicly available sources and downloaded as either ".jpg" or ".png" files and files were standardized as "Case _number." Images were uploaded into ChatGPT and run with a standardized prompt to identify the contractures in the image and recommend treatment. All runs were conducted in separate independent stateless ChatGPT sessions with memory, personalization, and conversation history disabled. Concurrently, this was compared to the consensus assessments from three board certified hand surgeons who independently determined the affected hand, digits, joints, and recommended treatment for each image. Accuracy was assessed for identification of the hand, digits, joints, and treatment recommendations as well as end-to-end agreement for all variables between ChatGPT and board certified plastic surgeons. For 12 images, no consensus was reached for the true contractures and accuracy was not assessed for these. Treatment recommendation was assessed with quadratic weighted Cohen Kappa for all cases regardless of digit identification to reflect true end-to-end analysis.

Results: Compared to consensus of the contracture identification from plastic surgeons, ChatGPT had an accuracy by category as follows: hand 69.7 percent, digit 30.3 percent, and joint 60.6 percent. Further, treatment accuracy was 24.2 percent however end-to-end agreement was 0 percent. Quadratic weighted Cohen Kappa was 0.00 for all cases regardless of digit identification. ChatGPT was not able to effectively identify the true nature of the contracture in the majority of cases and agreement for treatment recommendation compared to that of plastic surgeons was no better than chance alone.

Conclusions: This study demonstrates that using single-images alone ChatGPT is not effective for clinical identification or management of Dupuytren Contracture. This highlights the importance of evaluating the quality of information from AI when investigating medical conditions such as Dupuytren's contracture, although further studies are needed to effectively evaluate this.

A-1066 POSTOPERATIVE TEMPERATURE AND CONGESTION FINDINGS ASSOCIATED WITH DIGITAL REPLANTATION SURVIVAL

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Introduction: Although many studies have examined prognostic factors after digital replantation, few have focused on postoperative temperature and congestion.

Aim: This study aimed to clarify the relationship between early postoperative temperature and color findings and the survival outcome after digital replantation.

Material & Methods: We retrospectively analyzed 109 replanted digits in 88 patients treated between January 2019 and December 2024. The main outcome was survival of the replanted digit, and in necrosis cases, time to necrosis judgment was used for survival analysis. Clinical factors included sex, smoking, comorbidities, amputation level (Tamai zone classification), injury pattern (crush, avulsion, guillotine), and whether the amputation was complete or incomplete. Postoperative temperature and skin color were recorded every 3 hours for 48 hours. Temperature values and color scores were converted to numeric data to calculate minimum temperature, mean temperature, frequency below specific thresholds (27–32 °C), and proportion of digits showing congestion or severe congestion. Log-rank tests and Cox proportional hazards regression analyses were performed to assess associations with survival.

Results: The overall survival rate was 79 %. Log-rank tests showed significant differences by smoking history, amputation level, injury pattern, and completeness of amputation. In Cox proportional hazards analysis, minimum temperature within 48 hours (HR 0.70, $p = 0.0009$), time below 27 °C (HR 7.46, $p = 0.0014$), time below 28 °C (HR 2.08, $p = 0.0026$), proportion of digits with congestion (HR 3.57, $p = 0.0157$), and proportion with severe congestion (HR 13.46, $p = 0.0003$) were significantly associated with necrosis. In contrast, short-term differences between successive 3-hour measurements in temperature or color showed no significant relationship to outcome.

Conclusions: Lower absolute temperature and visible congestion within the first 48 hours after surgery were strongly associated with failure of digital replantation. The absolute value of temperature was more predictive of outcome than the magnitude of short-term fluctuations. Continuous monitoring of these parameters may help in the early detection and management of vascular compromise following digital replantation.

A-1067 EFFICACY OF SILVER NANOPARTICLES-LOADED BONE CEMENT AGAINST AN MRSA INDUCED-OSTEOMYELITIS IN A RAT MODEL

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Introduction: The purpose of this study was to assess the cytotoxicity and antibacterial effects of AgNP-impregnated Tetracalcium phosphate-dicalcium phosphate dihydrate (TTCP-DCPD).

Material & Methods: Using in vitro experiments, the cytotoxicity of AgNP impregnated TTCP-DCPD against fibroblasts and osteocytes was assessed in terms of cell viability by water-soluble tetrazolium salt assay. To assess antibacterial effects, a disc diffusion test was used; osteomyelitis was induced first in vivo, by injection of methicillin-resistant *Staphylococcus aureus* into the tibia of rats. AgNP-impregnated TTCP-DCPD bone cement was then applied at various silver concentrations for 3 or 12 weeks. Antibacterial effects were assessed by culturing and reverse transcription-polymerase chain reaction (RT-PCR). For histological observation, the bone tissues were stained using hematoxylin and eosin.

Results: Cell viability was decreased by the impregnated bone cement but did not differ according to AgNP concentration. The diameter of the growth-inhibited zone of MRSA was between 4.1 and 13.3 mm on the disks treated with AgNP, indicating antimicrobial effects. In vivo, the numbers of bacterial colonies were reduced in the 12-week treatment groups compared to the 3-week treatment groups. The groups treated with a higher (10) dose of AgNP(G2–G5) showed a tendency of lower bacterial colony counts compared to the group without AgNP(G1). The PCR analysis results showed

a tendency of decreased bacterial gene expression in the AgNP-impregnated TTCP-DCPD groups (G2–G5) compared to the group without AgNP (G1) at 3 and 12 weeks. In the H&E staining, the degree of inflammation and necrosis of the AgNP-impregnated TTCP-DCPD groups (G2–G5) showed a tendency to be lower at 3 and 12 weeks compared to the control group. Our results suggest that AgNP-impregnated TTCP-DCPD cement has antimicrobial effects.

Conclusions: This study indicates that AgNP-impregnated TTCP-DCPD bone cement could be considered to treat osteomyelitis.

A-1068 FIREWORK AND SPARKLER- RELATED BLAST HAND INJURIES DURING EASTER AND NEW YEARS ÈVE CELEBRATIONS IN GREECE: A THREE-YEAR EXPERIENCE FROM A LEVEL I HAND TRAUMA AND REIMPLANTATION CENTER
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Introduction: Firework/sparkler-related explosive Hand injuries are severe complex trauma due to the combined explosive and ballistic forces involved. These mechanisms can lead to a spectrum of damage, ranging from superficial burns to complex mangled injuries involving skin, muscle, tendon, nerve, vessel, and osseous structures, frequently culminating in traumatic digital amputations. Comprehension of injury patterns is essential to guide the algorithm management and reconstruction.

Aim: The aim of this study was to review our institutional experience with firework-associated hand blast injuries during Easter and New Years Eve celebrations in Greece and to analyze injury mechanisms, treatment strategies, and reconstructive procedures required.

Material & Methods: From 2022 to 2025, 52 patients underwent surgery for firework-related hand injuries in a single Level I Hand Trauma and Replantation center.

41 patients were admitted and underwent surgery on the same day, whereas 11 patients were re-directed to our Public Hand trauma Center after given basic life support in a peripheral public hospital due to other severe trauma.

All patients were operated under both general anesthesia and regional anesthesia(block).

Results: The cohort was predominantly male (96%), with a mean age of 27 years. The mean follow-up was 15 months (range: 8–28). Patients underwent an average of 2.6 surgical procedures (range: 1–6). The spectrum of injuries ranged from isolated digital nerve lesions to complex traumatic amputations. The mean hospital stay was 12.8 days. Fourteen patients required flap or skin-graft coverage for soft-tissue defects. Thumb and/or first web-space injuries occurred in fifteen patients (60%), representing the most common pattern of involvement. Amputation or finger shortening was necessary in 21 cases.

Conclusions: Firework and sparkler-related hand injuries result extensive soft-tissue and bone destruction and permanent functional impairment. Optimal management relies on thorough initial debridement, timely soft-tissue coverage, and prioritization of functional reconstruction rather than mere preservation of injured structures. Many patients require complex reconstruction and secondary procedures. Prevention through public education and supervised firework use remains the most effective strategy to reduce the incidence and severity of these injuries.

A-1069 PRIMARY TRAPEZIOMETACARPAL (TMC) ARTHROPLASTY IN A BENNET FRACTURE IN A SETTING OF SEVERE THUMB OSTEOARTHRITIS: A CASE REPORT

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Introduction: Bennet fractures are common intraarticular fractures of the base of the first metacarpal.

Not optimal restoration of the articular surface often leads to osteoarthritis, with pain and limited movement.

Aim: In patients with established and symptomatic TMC osteoarthritis, arthroplasty with MAIA® prosthesis could be a valid option.

Material & Methods: In July 2024 a right-handed man of 68 years old fell on his hand. Radiographs showed a Bennet fracture in a setting of Eaton-Littler stage 3 osteoarthritis, already painful and disabling according to the patient.

For a correct pre-operative planning a 3D model of the affected hand was produced.

The patient underwent TMC arthroplasty with a MAIA® prosthesis.

Results: two months after surgery the results reported no pain (VAS scale) and a considerable functionality and mobility of the first ray (AROM, Kapanji score and PRWHE were investigated).

The mean pinch strenght of the right hand was 7 kg and of the left hand 7.5 kg using a pinch meter. At one year follow up no complications were reported: the implant didn't show signs of loosening or subsidence.

Conclusions: TMC arthroplasty in Bennet fractures could represent a safe procedure in patients with established TMC osteoarthritis, however further studies are requested in order to clarify effectiveness and indications.

A-1070 EVALUATION OF HAND BALANCE AFTER MUTILATING UPPER EXTREMITY INJURIES: A SIX-CASE CLINICAL SERIES

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Introduction: The hand is a complex organ in which grasping, fine motor skills, sensory feedback, and postural stability operate in continuous coordination throughout daily life. Mutilating upper extremity injuries involve simultaneous damage to bone, joints, tendons, nerves, and vascular structures, often requiring multistage reconstruction. Because no two injuries share the same magnitude, location, or combination of affected structures, predicting postoperative outcomes is inherently difficult.

Initial treatment typically focuses on limb salvage and soft-tissue coverage. However, long-term quality of life is determined primarily by the restoration of functional hand balance. Hand balance represents the integrated outcome of multiple domains, including flexor–extensor tendon equilibrium, joint range of motion and contractures, axial and rotational alignment of the digits, sensory function and proprioception, and postural stability during grasp-and-release activities. Although quantitative metrics—such as range of motion, grip strength, pinch strength, and sensory testing—are informative, the most important outcome measure is the extent to which the reconstructed extremity can be reintegrated into daily life.

Aim: Despite multistage reconstructive procedures and postoperative rehabilitation, patients with mutilating upper extremity injuries frequently experience significant deficits in hand function and balance. This study aims to define the concept of hand balance in the post-reconstruction period and to discuss the major factors influencing it through a six-case clinical series.

Material & Methods: Six patients who underwent multiple surgical procedures for mutilating upper extremity trauma between 2024 and 2025 were retrospectively reviewed. Injuries were evaluated for bone, tendon, nerve, soft-tissue, and vascular involvement, as well as surgical interventions performed. Hand balance was objectively assessed using range of motion, presence of contractures, amputation level, associated nerve injuries, grip and pinch strength, proprioception, and functional outcome scores (DASH/PRWHE).

Results: All patients sustained high-energy crush injuries, most commonly machinery-related. Two patients had multiple digital amputations reconstructed with free ALT flaps; two had zone 2 flexor injuries and/or volar plate contractures; and one had post-traumatic radial nerve/PIN axonal injury. Common findings included PIP/DIP flexion contractures, extensor mechanism weakness, malrotation, decreased grip strength, and varying degrees of chronic pain. Sensation was preserved in most patients, and vascular status remained stable.

Conclusions: In mutilating upper extremity trauma, limb salvage alone is insufficient. Restoring hand balance is essential for long-term functional recovery. Reconstruction should prioritize joint-preserving fixation, procedures that re-establish flexor–extensor tendon equilibrium, osteotomies to correct axial alignment, and selection of flaps that provide acceptable volume and contour. Prospective studies utilizing standardized hand balance assessments are needed to more clearly define the impact of surgical techniques and rehabilitation protocols on functional outcomes

Keywords: hand trauma, crush injury, hand balance, amputation, contracture, free flap, radial nerve

A-1071 MACHINE-LEARNING FRAMEWORK USING DEPTH CAMERAS FOR TENDON-GLIDING MOTION CLASSIFICATION

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Introduction: Motion analysis is a valuable tool for evaluating pathological hand function. Tendon-gliding movements reflect the coordinated excursion of flexor tendons within the pulley system, and when quantified using temporal parameters, they provide sensitive indicators of tendon excursion efficiency, neuromuscular coordination, and mechanical restrictions. Abnormal timing patterns can reveal early adhesions, neuropathy, pulley limitations, or subtle motor-control deficits that are often undetectable during routine clinical examination. Temporal analysis of tendon gliding therefore offers important clinical insight for identifying impairment mechanisms, guiding treatment decisions, and monitoring recovery after tendon injury or surgery. However, quantitative tendon-gliding assessment remains limited in clinical practice due to the cost, laboratory requirements, and complex workflows of conventional motion-capture systems. Advances in depth-sensing technology and machine-learning–based pose estimation present opportunities for developing low-cost, portable, and automated assessment tools. Their performance and reliability for clinical tendon-gliding evaluation, however, require systematic validation.

Aim: This study aimed to evaluate and optimize a low-cost, machine-learning–based motion-capture framework by integrating depth-sensing cameras with pose-estimation algorithms for accurate classification of tendon-gliding movements.

Material & Methods: A depth camera (Orbbec Gemini 2XL) and a 3D Vicon Vero system were used simultaneously to record five standardized tendon-gliding movements: hand open, hook fist, lumbrical position, straight fist, and close fist. Three participants performed 30 cycles of movement (five tests of six cycles each). To examine the influence of training data volume, three dataset conditions were created: the original RGB-video dataset (45 samples), a threefold augmented dataset (180 samples), and a sixfold augmented dataset (320 samples).

Two algorithm-development approaches were implemented:

(1) Video Classification Method: An RGB-based deep-learning classifier was trained using data augmentation to enhance robustness.

(2) Keypoint-Based LSTM Method: A pretrained MMPose model extracted 2D coordinates of 21 anatomical landmarks (42 features), which were input as temporal sequences to a bidirectional long short-term memory (Bi-LSTM) classifier with two stacked LSTM layers. Sixty labeled sequences (12 per class) were generated and split into training and validation sets (75/25).

The analysis pipeline included data import, hand-region preprocessing, temporal resampling, class labeling, keypoint extraction, model training, and performance evaluation using accuracy, precision, recall, and F1-score.

Results: Training data volume had a substantial impact on video-based classification. With the original 45-sample dataset, the RGB classifier achieved 13.3% accuracy and an 11.3% F1-score, demonstrating limited generalization. With threefold augmentation (180 samples), accuracy increased to 80.0% and the F1-score to 78.5%. With sixfold augmentation (320 samples), accuracy improved further to 86.6% and the F1-score to 85.5%.

The keypoint-based Bi-LSTM model outperformed the RGB-based approach. Using temporal sequences of 2D landmarks, the Bi-LSTM achieved 93.33% accuracy, 95.00% precision, 93.33% recall, and a 93.14% F1-score. These results show that temporal modeling of keypoint features provides superior discrimination of tendon-gliding patterns compared with raw RGB features. Increasing training data volume improved robustness across both approaches.

Conclusions: This study supports the feasibility of a low-cost, machine-learning system for accurate tendon-gliding classification. Depth sensing combined with pose estimation and Bi-LSTM temporal modeling yields high performance with minimal hardware requirements.

A-1072 PISIFORM SUBLUXATION IN SCAPHOID FRACTURES: DOES IT HAVE CLINICAL SIGNIFICANCE

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Introduction: Pisiform subluxation has been described in association with distal radius fractures and is thought to result from altered wrist alignment. However, there have been no previous reports describing its occurrence in conditions involving the scaphoid, despite the potential for chronic carpal changes and ulnar-sided wrist pain that may arise in longstanding scaphoid fracture or nonunion. Determining whether pisiform subluxation occurs in these cases may help clarify its clinical relevance.

Aim: To determine the incidence and clinical significance of pisiform subluxation in patients with scaphoid fractures or nonunion.

Materials and Methods: We retrospectively analyzed 77 patients with scaphoid fractures or nonunion who underwent CT evaluation between 2015 and 2025. The cohort included 69 males and 8 females, with a mean age of 28.8 years (range, 13–74). There were 38 acute fractures (mean age 27.6 years) and 39 nonunion cases (mean age 29.9 years).

Pisiform subluxation was assessed on sagittal CT and classified into three types—wide, non-parallel, and decentered—based on the classifications described by Vasilas et al. and Tajima et al. The three types were defined as follows: wide type ≥ 4 mm joint space widening; non-parallel type $>20^\circ$ joint surface inclination; and decentered type ≥ 2 mm proximal or distal displacement.

Patients were divided according to the presence or absence of subluxation. In the subluxation group, we evaluated time from injury, fracture pattern, pisotriquetral arthrosis, and postoperative CT alignment changes. Radiographic parameters included the scapholunate angle (SLA), radiolunate angle (RLA), and carpal height ratio (CHR). Statistical analysis used

Fisher's exact test and the Mann–Whitney U test, with significance set at $p < 0.05$.

Results: Pisiform subluxation occurred in 27 of 77 cases (35%): 9 fractures and 18 nonunion cases. Types included 4 wide, 6 non-parallel, and 17 decentered types. The mean age was higher in the subluxation group (33.6 vs 26.2 years). In acute fracture cases, no significant difference in surgical waiting time was observed, although the subluxation group showed a slightly longer duration (15.0 vs 11.9 days).

No difference in fracture pattern was seen between the groups.

Among 15 patients presenting more than one year after injury, 10 had delays exceeding 10 years, and 8 of these exhibited pisiform subluxation. Postoperative CT showed improvement in 3 wide-type cases, while 1 progressed to decentered type. Pisotriquetral arthrosis was found in 9 cases, 8 with delays greater than 10 years. SLA was significantly greater in the subluxation group (67° vs 55.5°), whereas RLA and CHR showed no significant differences.

Discussion: Unlike distal radius fractures, CT positioning in scaphoid fractures minimizes wrist angle variability, suggesting that pisiform subluxation may reflect structural changes. Increased SLA in the subluxation group suggests that scaphoid palmar flexion may contribute to this condition. Most cases were decentered type and showed little postoperative improvement. Long-standing nonunion was associated with pisotriquetral arthrosis.

Conclusion: Pisiform subluxation occurred in 35% of cases, including scaphoid fractures and nonunion. In chronic nonunion (>10 years), pisotriquetral arthrosis was common. Pisiform subluxation may contribute to ulnar-sided wrist pain in chronic scaphoid pathology.

A-1073 THE DISTAL RADIUS ULNAR AND VOLAR CORTICES ARE A RELIABLE RADIOGRAPHICAL MARKER OF THE NORMAL WRIST CENTRE OF ROTATION

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Introduction: Assessment of the microstructure of the distal radius demonstrates that the ulnar and volar cortices are the load-bearing components of the radius. We hypothesise that the centre of rotation (COR) for the wrist lies directly distal to these cortices.

Aim: The aim of this study was to define the radiographic relationship between the distal radius and the COR.

Material & Methods: 200 consecutive normal wrist radiographs were identified. The COR of the wrist, defined by Youm as the centre of the proximal pole of the capitate on the PA view and the lunocapitate articulation on the lateral view, was identified. We drew circles of best fit over the capitate (PA view) and the lunocapitate joint (lateral view). These circles were portioned into thirds. Lines were drawn through the ulnar and volar cortices of the radial shaft parallel to the long axis of the radius on PA and lateral radiographs. We defined the offset as the distance from this line to the COR. The offset and the third of the COR through which the line passed was recorded.

Results: 200 (90 left/110 right) wrists were identified in 195 patients (74 males and 121 females) with a mean age 40 years. On the PA radiographs the mean COR offset was ulnar 0.07mm (+/- 1.1mm). The Ulnar Cortical Line passed through the central third of the COR in 94% of wrists. On lateral radiographs the mean COR offset was dorsal 0.09mm (+/- 1.4mm). The Volar Cortical Line passed through the central third of the COR in 97% of wrists.

If both PA and lateral radiographs are considered, the Ulnar Cortical Line and Volar Cortical Lines pass through the central third of the COR in 91% of wrists.

Conclusions: The centre of rotation lies directly above the ulnar-volar cortex of the radius in over 90% of normal wrists.

We believe that this radiographic relationship may be of significant clinical use when assessing normal and abnormal wrist radiographs.

A-1074 IMPLICIT MOTOR IMAGERY ABILITY IN HEALTHY ADULTS: EFFECTS OF AGE, EDUCATION, AND MENTAL STATE

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Introduction: The ability to imagine or simulate experiences is one of the most extraordinary capabilities of our mind. Implicit motor imagery ability refers to the capacity to use internal representations of body movements without conscious awareness or deliberate effort when mentally simulating an action.

Aim: The aim of this study was to investigate the factors associated with implicit motor imagery ability in healthy adults.

Material & Methods: A total of 109 participants (66 females) with a mean age of 32.28 ± 12.13 years were included. The study was conducted in the outpatient clinic between May 2025 and November 2025, following the approval of the ethics committee. Participant characteristics including age, sex, height, body weight, dominant hand, and educational status were recorded in the case report form. Implicit motor imagery ability was assessed using the right–left discrimination (lateralization) test through the mobile application Recognise Hand. Psychological status was evaluated using the Turkish Short Form of the Depression Anxiety Stress Scale (DASS-21), attention levels were assessed with the Mindful Attention Awareness Scale (MAAS) Statistical analyses were performed using SPSS version 20 (IBM Corp., Armonk, NY, USA). The relationship between age and laterality accuracy and response time was examined using Spearman's correlation. The associations of DASS-21 and the MAAS with laterality accuracy and response time were analyzed using Pearson's correlation. The relationship between education level and laterality accuracy and response time was evaluated using a one-way analysis of variance. A significance level of $p < 0.05$ was adopted for all analyses.

Results: A weak negative correlation was found between age and laterality accuracy ($p = -0.277, p < 0.05$). Age also showed a moderate negative correlation with response time ($p = -0.404, p < 0.01$). DASS-21 scores demonstrated a weak negative correlation with laterality accuracy ($r = -0.252, p < 0.05$), whereas no significant relationship was observed between DASS-21 and response time ($p > 0.05$). Similarly, MAAS scores were not significantly associated with either laterality accuracy or response time ($p > 0.05$). A significant difference was found between education levels in terms of laterality accuracy (one-way ANOVA, $p = 0.008$). Post hoc comparisons indicated that participants with a postgraduate education performed significantly better than those in the other education categories. No significant differences were observed between education groups regarding response time ($p > 0.05$).

Conclusions: This study demonstrated that implicit motor imagery ability is influenced by age, psychological status, and educational level. These findings suggest that implicit motor imagery, which is increasingly incorporated into hand rehabilitation, may be optimized when tailored to individuals' cognitive and psychological profiles. Integrating patient-specific factors into the early stages of rehabilitation may enhance engagement and support functional recovery.

A-1078 OCCLUSIVE DRESSING: WHAT ABOUT DERMATOGLYPHS?

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Introduction: the recovery of tactile sensitivity is good after occlusive dressing (Weber = 2.5 to 4 mm) and better than after flaps without nervous iatrogeny (Pastor T & al Eur J Trauma Emerg Surg 2023, Bensa M & al Hand Surg Rehabil 2023, Randazzo L & al J Hand Surg Eur 2024). The occlusion and moist environment prevent the formation of a crust and allow the secretion of growth factors with microbial proliferation (Lasserre G & Obert L Chir Main 2010, Hoigné D & al JHS b 2014, Boudard J al Hand Surg Rehabil 2019)

Aim: To evaluate the clinical and functional outcomes of fingertip reconstruction with conservative treatment using occlusive dressings up to zone 3 with special focus on dermatoglyphs.

Material & Methods: A retrospective monocentric study was conducted on 26 patients (28 fingers) who presented an amputation in zones 1, 2, or 3, treated with occlusive dressings. The evaluation included epidemiological data on the trauma, the number of dressings required, healing time, satisfaction, recovery of sensation, regeneration of dermatoglyphs, pulp trophicity, complications, and functional scores.

Results: At a mean follow-up of 11.8 months, healing was achieved in 4.2 weeks after an average of 4 dressings. Pulp trophicity was excellent or good in 96.4% of cases. Finger mobility was fully preserved in 89.3% of fingers. All patients showed the reappearance of dermatoglyphs. Sensitivity tested by Weber's test was reduced by 24% (4.6 mm vs. 3.5 mm contralateral). Nail dystrophies were noted in 60.4% of fingers, mainly following amputations in zone 3. Cold intolerance was reported in 35.7% of fingers. Functional scores confirmed satisfactory recovery and satisfaction was high: Quick DASH : 9,5 FIOS : 11,96 digit Score: 7,57.. The most frequently reported inconvenience was the odor emitted by the dressings despite the use of charcoal.

Conclusions: Occlusive dressings represent a reliable, non-invasive, and reproducible alternative in fingertip amputations in zones 1 and 2. Despite limitations in zone 3, the aesthetic and functional outcomes justify its use as a first-line treatment. The regeneration of dermatoglyphs is a reality that has functional but also legal consequences

A-1080 RETENTIVE SCREWED CUP PROSTHESIS IN FIRST CMC OSTEOARTHRITIS: LONG-TERM OUTCOMES AND COMPLICATIONS

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Introduction: When medical treatment is no longer able to control the pain of thumb osteoarthritis, a trapeziometacarpal prosthesis offers a reliable surgical alternative. Retentional screw-retained implants, such as the ISIS® and HORUS® prostheses, offer increased stability and the promise of rapid recovery with a low complication rate over long-term follow-up.

Aim: The objective of this study was to evaluate the long-term functional and radiographic outcomes of ISIS® and HORUS® prostheses implanted for resistant thumb osteoarthritis, as well as to analyze the patients' subjective experience.

Material & Methods: This was a retrospective multicenter study of implantations performed between 2007 and 2023 in

2 centers. 119 prostheses in 95 patients were included in the final analysis. The mean age at the time of surgery was 64.7 years (range 40–87). The mean follow-up was 6.4 years (range 0.8–19.4). Clinical evaluation was based on the QuickDASH, Kapandji, Buffalo, and TASD scores, as well as an indirect pinch test. Radiological analysis included assessment of implant positioning, the presence of any periprosthetic radiolucent lines, and the progression of osteoarthritis.

Results: The patients were predominantly female (78.9%). Preoperatively, the mean QuickDASH score was 75.4 (range 9.1–100), the mean Kapandji score was 8.1 (range 4–10), and the mean pinch test weight was 3.7 kg (range 0–11). At the last follow-up, the QuickDASH score decreased to 20.9 (0–86.4), the Kapandji score increased to 9.5 (4–10), and the pinch test reached 7.6 kg (0–11). All these improvements were statistically significant ($p < 0.001$). Radiologically, 22.8% of the prostheses showed a periprosthetic radiolucent line, without any significant clinical consequences. Periarticular ossifications were observed in 26.9% of cases. No dislocations or infections were recorded. Six patients (5.1%) underwent revision surgery, primarily for cup depression or troublesome calcifications. Clinical and radiological results were similar between the ISIS® and HORUS® prostheses, despite a longer follow-up for ISIS® (8.5 years [1.2–17.9] vs. 1.7 years [0.8–3.2]).

Conclusions: ISIS® and HORUS® screwed and retentive cup trapeziometacarpal prostheses offer excellent results, with significant long-term functional improvement and a low complication rate. The absence of significant dislocation or loosening, combined with a notable increase in pinch test and functional scores, demonstrates the reliability of these implants. These prostheses allow for rapid recovery, lasting stability, and represent a safe and effective therapeutic option for the treatment of advanced rhizarthrosis.

A-1081 WHAT ARE THE OUTCOMES OF TRAPEZIOMETACARPAL PROSTHESES IN PERITRAPEZIAL OSTEOARTHRITIS?

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Introduction: Scaphotrapeziotrapezoid (STT) osteoarthritis is frequently associated with trapeziometacarpal rhizarthrosis. This association has often been considered a risk factor for poorer outcomes after trapeziometacarpal prosthesis implantation, with some authors favoring trapezectomy or combined procedures. The question is whether the presence of STT osteoarthritis worsens the arthritic progression or impairs functional outcomes after trapeziometacarpal arthroplasty with a screw-retentive cup.

Aim: The objective was to compare the functional and radiological outcomes of two groups: a group of patients with STT osteoarthritis associated with rhizarthrosis and a group of patients with isolated rhizarthrosis, in order to determine whether the placement of a trapeziometacarpal prosthesis worsens STT osteoarthritis or alters the outcomes compared to isolated rhizarthrosis.

Material & Methods: This was a retrospective, observational, multicenter study including patients operated on between November 2007 and December 2023 in two centers. Ninety-five patients with 119 prostheses were analyzed. Among them, 35 patients with associated STT osteoarthritis received 40 prostheses, while 60 patients with isolated rhizarthrosis received 79 prostheses.

The mean age at the time of surgery was 64.3 years (range 44–87) in the peritrapezial osteoarthritis group and 65.0 years (range 40–86) in the isolated rhizarthrosis group. The mean follow-up was 6.1 years (range 1–15.2) and 6.6 years (range 1–17.9), respectively, with no significant difference. Clinical evaluation was based on the QuickDASH, Buffalo, Kapandji, and TASD scores, as well as an indirect pinch test. Radiological analysis assessed the rhizarthrosis stage (Dell), the STT

stage (Crosby, SCFM), and the progression of this osteoarthritis at the last follow-up.

Results: In the peritrapezial osteoarthritis group, the osteoarthritis was most often mild, with 70.0% Crosby stage 1 and 60.0% SCFM stage 1. The mean Dell score for rhizarthrosis was 2.5 (0–4), compared to 2.6 (1–4) in the isolated rhizarthrosis group. At the last follow-up, functional scores showed no significant difference between the two groups. In patients with associated STT osteoarthritis, the mean QuickDASH score was 20.8 (0–79.5), the Kapandji score was 9.5 (7–10), and the pinch test was 7.5 kg (0–11). In patients with isolated rhizarthrosis, the mean QuickDASH score was 21.0 (0–86.4), the Kapandji score was 9.5 (4–10), and the pinch test was 7.6 kg (0–11). These very similar values indicate a comparable functional benefit in both groups. Radiologically, there was no significant difference between the groups regarding the appearance of periprosthetic radiolucent lines, loosening, or ossification. Among the 40 prostheses implanted in patients with preoperative STT, radiological worsening of STT osteoarthritis was observed in 8 patients (20.0%), without a significant impact on functional scores.

Conclusions: The presence of STT osteoarthritis associated with rhizarthrosis does not alter the functional outcomes of the screw-retained cup-retained trapeziometacarpal prosthesis and does not lead to a clinically detrimental worsening of this osteoarthritis at a mean follow-up of 6.1 years. Patients with associated STT achieve functional scores and radiological outcomes comparable to those of patients with isolated rhizarthrosis. The placement of a trapeziometacarpal prosthesis in this context therefore does not aggravate rhizarthrosis or STT osteoarthritis, and peri-trapezial osteoarthritis should not be considered a contraindication to this arthroplasty.

A-1082 PERIPROSTHETIC FRACTURES OF TRAPEZIOMETACARPAL PROSTHESES: A MULTICENTER STUDY

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Introduction: Fractures around trapeziometacarpal (TMC) prostheses are a rare but significant complication that can change the "surgical journey". Published series show considerable variability in fracture rates depending on the implant generation. This multicenter study analyzes the types of fractures, their treatments, and the observed functional outcomes, illustrated by detailed clinical cases.

Aim: The primary objective was to describe the epidemiology, nature, and management of periprosthetic TMC fractures, whether occurring intraoperatively or postoperatively. The secondary objective was to evaluate the functional outcomes after treatment, illustrated by the available numerical scores.

Material & Methods: The study includes data from six centers, totaling twelve patients with thirteen TMC prostheses. The mean age was 66 years. Associated factors included three cases of osteoporosis, corticosteroid therapy, an anxiety/depressive disorder, and anticoagulant treatment. A parallel literature review of fifteen series (969 prostheses implanted between 1993 and 2023) reported fracture rates ranging from 7% to 14% for the first generations, 10% to 30% for some alternative mechanical designs, and <4% for prostheses implanted after 2010.

Results: All fractures identified in the multicenter cohort were peritrapexic fractures. Of the thirteen fractures, nine were postoperative, occurring between two months and seven years after implantation, and four were intraoperative. In 92% of cases, the prostheses were of the truncated cone type (Isis, Touch, Moovis, Ivory, Elektra). Treatments varied according to the type of fracture: six trapeziectomies (two of which were completed with a pyrocarbon implant), one simple prosthesis removal without trapeziectomy, two revision prostheses with a screw-retained or hemispherical cup combined with a cancellous bone graft, and three cases of conservative management for intraoperatively stable fractures.

Functional outcomes were generally satisfactory, with Kapandji and QuickDASH scores indicating adequate recovery. No statistical correlation was demonstrated between the type of fracture, its timing, the chosen treatment, or the functional results. The observed complications were a metacarpal fracture and a nonunion.

Conclusions: Periprosthetic TMC fractures require individualized management, guided primarily by the stability of the fracture and the condition of the trapezium. Intraoperatively, a stable fracture allows the procedure to proceed, while an unstable fracture necessitates osteosynthesis or trapeziectomy if the bone is not reconstructible. Postoperatively, the indication depends on the bone stock: revision surgery with a screw-retained cup combined with a cancellous bone graft may be considered, while trapeziectomy remains a reliable solution in cases of major injury.

The reported functional scores show satisfactory results, with QuickDASH scores ranging from 0 to 2.27 and Kapandji scores from 7 to 8, demonstrating significant recovery despite the fracture complication.

A-1083 INFLUENCE OF TITANIUM ELASTIC NAIL PRE-CONTOURING ON FRACTURE REDUCTION OF PAEDIATRIC DIAPHYSEAL FOREARM FRACTURES

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Introduction: Forearm shaft fractures are common pediatric injuries. When surgical treatment is indicated, elastic stable intramedullary nailing is widely used due to its minimally invasive nature and favorable outcomes. Nail design may vary—straight, pre-contoured, or a combination of both—however, the influence of these configurations on fracture reduction has not been clearly explored.

Aim: The aim of this study was to radiologically investigate in a human cadaveric model the effect of nail shape on fracture reduction in transverse diaphyseal fractures of the radius and ulna.

Material & Methods: Twelve human cadaveric forearms from six adult donors were used and standardized AO PCCF 22-D/4.1 transverse diaphyseal fractures of the radius and ulna were created. Titanium elastic nails (TENs) were inserted retrograde in the radius and antegrade in the ulna creating 3 groups with either 2 straight TENs (Group 1), 1 straight and 1 curved TEN (Group 2), or 2 curved TEN (Group 3). Anteroposterior radiographs of each intact and instrumented specimen in each group were taken in supination. Parameters of interest included total bone length, maximal radial bow (MRB), and the location of maximal radial bow (LMRB).

Results: After TEN instrumentation MRB decreased significantly in Group 1 and increased significantly in Group 2 ($p \leq 0.003$), however, it was without a significant change in Group 3 ($p = 0.113$). In addition, MRB in instrumented state was significantly lower in Group 1 versus both Group 2 and Group 3 ($p \leq 0.005$). LMRB did not change significantly after instrumentation in each separate group and remained comparable across the groups ($p \geq 0.213$). Both total bone lengths remained nearly unchanged after instrumentation across the groups ($p \geq 0.608$).

Conclusions: The use of two curved TENs resulted in smallest deviation from the natural anatomical alignment after reduction of both-bone pediatric forearm fractures. Fixation of these fractures with one straight and one curved TEN leads to overcorrection of the radial bow whereas utilization of two straight TENs leads to the most inferior results, with reduction of the radial bow and anticipated loss of range of motion in the forearm of treated patients.

A-1084 BIPOLAR RADIAL HEAD PROSTHESIS INS TERRIBE TRIAD : A BIOMECHANICAL PROBLEM OR A REAL SOLUTION ?

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Introduction: Radial head prosthesis is indicated in cases of displaced, comminuted, multi-fragment fractures (more than 3 fragments with a neck fracture), modified Mason type 3 or 4 fractures, with ligamentous injuries.

Aim: The objective of this study was to report a continuous series of dual-mobility radial head prostheses, implanted and evaluated continuously over 25 years, with a final retrospective evaluation in the homogeneous triad group

Material & Methods: Among 102 complex dislocations (dislocation with fracture), 47 required a radial head prosthesis (dual mobility – Judet-Tornier CRF). Of these 47 prostheses, 35 were implanted in terrible triad cases. Evaluations by two independent surgeons allowed for the measurement of functional (range of motion, MEPS and PREE scores, QuickDASH, professional and leisure activities) and radiological (radial rim, loosening, ossification, revision) outcomes. Surgery was performed via a double or posterior approach.

Results: 35 patients aged 53 years (range 27-72) were evaluated with a 90-month follow-up (range 48-240). All cases involved posterolateral triads. The medial collateral ligament (MCL) required repair in 3 cases. 3 prostheses were removed (10%) due to excessive tightness. Evaluation revealed flexion/extension range of motion of 142°/11°, pronation/supination range of motion of 85°/70°, MEPS score of 82.2 (range 60-100), QuickDASH score of 19.8 (range 0-40.9), and PREE score of 7.27 (range 0-26). Two cases of preoperatively resolving radial nerve palsies were observed. Radiological evaluation revealed 20% radiolucent lines, 50% humeroulnar osteoarthritis and ossification, and 10% of cases requiring removal of overly tight implants. No painful loosening or elbow instability necessitated reoperation.

Conclusions: A review of the literature shows that series of radial head prostheses for complex elbow dislocations are small. Between 12 and 80 patients have a follow-up of 2 to 25 years. Radiolucent lines are present in 20% to 50%, ossification in 20% to 40%, a stiff elbow in 10% to 20%, painful loosening in 20% to 30%, and a revision rate between 20% and 40%. While triad series are few in number, results are improving as posterolateral and anteromedial types are recognized and better treated, but osteoarthritis remains common. Analysis of complex dislocations must continue in order to offer the best care while avoiding pitfalls: there are transolecranon fractures with capsuloligamentous lesions and triads with nerve or muscle lesions. Capsule need to be reinserted. Bipolar implants have been not recommended due to biomechanics works but impossible to extrapolate at clinical level : bipolar implant can be considered as safe and efficient implant for terrible triad.

A-1085 MORPHOLOGICAL FACTORS CONTRIBUTING TO ZIGZAG DEFORMITY IN THUMB CARPOMETACARPAL OSTEOARTHRITIS

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Introduction: Thumb carpometacarpal (CM) osteoarthritis is commonly encountered in postmenopausal women, with a reported prevalence of 21%–35%. Some patients develop a Zigzag deformity characterized by metacarpophalangeal (MP) hyperextension, which complicates both diagnosis and treatment. However, the mechanisms underlying this deformity remain unclear.

Aim: This study aimed to investigate how morphological changes of the thumb metacarpal base influence deformity patterns in adjacent joints, with particular focus on MP hyperextension and Zigzag deformity.

Materials and Methods: We retrospectively analyzed 54 patients (16 men and 38 women; age range 49–89 years, mean 67.5 years) diagnosed with CM osteoarthritis who underwent computed tomography (CT) at our institution between 2018 and 2025. Metacarpal slope (MC slope) was defined as the angle between the CM joint surface and the dorsal cortex of the metacarpal on sagittal CT slices through the mid-diaphysis. CM osteoarthritis severity was graded using the Eaton classification, while degeneration of the MP and interphalangeal (IP) joints was assessed using the Kellgren–Lawrence (KL) classification. Zigzag deformity was evaluated by measuring MP and IP joint flexion angles in a natural resting position and was defined as MP extension $>0^\circ$ and IP flexion $>0^\circ$.

Results: MC slope showed a strong positive correlation with MP hyperextension ($r = 0.68$, $p < 0.01$). Simple linear regression confirmed a significant association between MC slope and MP alignment ($\beta = 0.32$, $p = 0.001$; $R^2 = 0.462$). Logistic regression identified MC slope as a significant predictor of MP hyperextension (odds ratio 1.24, $p = 0.024$). A lower MC slope was associated with an MP angle $<0^\circ$, indicating hyperextension. However, no significant associations were found between MC slope and degenerative changes (KL grade) in adjacent joints. Additionally, neither MC slope nor the presence of a Zigzag deformity showed a significant association with the Eaton classification stages of CM osteoarthritis, suggesting that deformity patterns were not directly related to the radiographic severity of adjacent joint degeneration.

A-1086 CASE REPORT: PSEUDOANEURYSM OF THE COMMON PALMAR DIGITAL ARTERY IN AN AVOCADO HAND

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A 40-year-old male patient presented six weeks after sustaining a stab injury to the palm while cutting an avocado. The initial management in an external emergency department consisted of wound irrigation and primary closure. Three weeks after the injury, the patient noted a progressive swelling in the third–fourth intermetacarpal space. As the lesion continued to grow and an increasing hyposensitivity of the ulnar proper palmar digital nerve of the middle finger developed, the patient sought further evaluation at our institution.

On clinical examination, a firm, pulsatile, and pressure-sensitive swelling was evident in the intermetacarpal region III/IV. Duplex ultrasonography revealed a well-demarcated lesion measuring $20 \times 17 \times 19$ mm. The lesion demonstrated predominantly hyperechoic tissue components with a central anechoic area consistent with intralesional thrombosis. Doppler ultrasound imaging showed a characteristic bidirectional flow pattern (“yin-yang sign”), raising strong suspicion for a post-traumatic pseudoaneurysm. The lesion was located immediately proximal to the bifurcation of the common palmar digital artery into the proper palmar digital arteries to the middle and ring finger. The patient underwent resection of the pseudoaneurysm followed by microsurgical end-to-end anastomosis of the affected common palmar digital artery. The expanding pseudoaneurysm exerted pressure directly on the ulnar proper palmar digital nerve of the middle finger, leading to a neurapraxia.

The formation of a pseudoaneurysm after penetrating hand injuries, is rare. Early-stage symptoms may be subtle. Duplex ultrasound remains the diagnostic modality of choice, with the presence of a yin-yang sign and swirling flow pattern serving as hallmark features. Surgical excision with microsurgical end-to-end anastomosis is often recommended to ensure good vascular supply to the finger.

A-1087 CONSENSUS AND CRITERIA IN TREATMENT OF METACARPAL SHAFT FRACTURES: A SURVEY OF CURRENT PRACTICE IN SWITZERLAND

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Introduction: Metacarpal shaft fractures are common injuries in working-age individuals, where treatment decisions carry significant functional and socioeconomic implications. Although clear indications exist for surgery in certain fracture patterns, considerable variation persists in clinical decision-making. An ongoing investigation at our institution has shown a recent shift toward non-operative care, with many fractures treated conservatively and achieving very good outcomes. **Aim:** To investigate current treatment preferences among Swiss hand surgeons for different metacarpal shaft fracture patterns, quantify intersurgeon and intrasurgeon variability, and identify fracture scenarios that generate the greatest disagreement in clinical decision-making.

Material & Methods: A total of 46 surgeons participated, representing all major linguistic regions and a range of practice settings. Ages ranged from 29 to 65 years (median 40), including 11 residents and 35 fully trained surgeons. Hand surgery experience ranged from 1 to 35 years (median 9). Twelve standardized radiographic vignettes of single and multiple metacarpal shaft fractures were presented, accompanied by relevant clinical information such as rotational deficit, age, and hand dominance. Surgeons selected their preferred treatment—surgical or conservative—for each case. In clinical reality, 10 of the 12 cases presented had been treated conservatively at our institution and 2 surgically.

Results: Across all vignettes, the mean proportion of surgical recommendations was 0.546 (median 0.50), indicating no overall preference for either treatment strategy. Surgical recommendations varied widely between scenarios, ranging from approximately 17–30% to 90–100%. Regional differences were statistically significant ($p = 0.039$), while gender, years of experience, proportion of hand surgery in daily practice, and practice setting showed no association with treatment patterns. The lowest agreement occurred in vignettes involving multiple metacarpal shaft fractures, where surgical and conservative recommendations were nearly evenly distributed, reflecting uncertainty and divergent interpretation. Intrarater reliability, assessed in the 13 surgeons who completed the survey twice, was substantial (Cohen's kappa = 0.616, $p < 0.001$). Some fracture patterns demonstrated notable within-surgeon variability, whereas others remained stable despite high intersurgeon disagreement.

Conclusions: These findings demonstrate considerable variability in treatment decisions for metacarpal shaft fractures among Swiss hand surgeons. Most cases included in the survey were treated conservatively in clinical practice, achieving good outcomes in our ongoing study. This contrast between real-world success with conservative management and substantial variation in surgeon preferences suggests that current surgical indication criteria may warrant re-evaluation. Identifying the fracture- and surgeon-related factors that create the greatest disagreement may help inform future recommendations, harmonize clinical practice, and support the development of clearer, evidence-based treatment guidelines.

A-1088 BILATERAL METACARPAL SYNOSTOSIS AND POSTAXIAL POLYDACTYLY IN A TODDLER: A FAMILIAL CASE AND SURGICAL MANAGEMENT

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Introduction: Metacarpal synostosis is a rare congenital hand anomaly that may present in association with other malformations, including polydactyly. We report the case of a 3 year old boy with a history of bilateral III–IV metacarpal synostosis, right postaxial polydactyly, and a maternal history of metacarpal synostosis.

Aim: This study aims to highlight how individualized reconstructive choices – guided by anatomical conditions and surgical approach – can optimize alignment and functional results in children with congenital malformations.

Material & Methods: The first-stage surgical intervention was performed at the age of 17 months on the right hand and consisted of the partial excision of the supernumerary digit and harvesting of an autologous osseous spacer from the excised digit. Postosteotomy, the spacer was interposed at the level of the III–IV metacarpal synostosis to restore metacarpal separation and improve digital alignment. Subsequently, the patient underwent corrective surgery on the left hand. Due to progressive postoperative remodeling and insufficient correction in the right hand, an allograft was considered for the correction of the fused bone mass in the left hand – additional autologous tissue remained after initial excision of the supranumerary digit but was intentionally not used to avoid the risk of recurrent fusion. Thus, a polypropylene spacer was placed following osteotomy of the III–IV metacarpal synostosis.

Results: Healing was uneventful on both sides, with good soft-tissue recovery and preserved mobility. The right hand had a mean follow-up of 20 months, showing stable alignment and function throughout, while the left hand demonstrated similarly favorable early outcomes at 1-month follow-up.

Conclusions: This case shows that adapting the reconstructive approach—by choosing either autologous or synthetic spacers based on anatomical conditions—can lead to balanced postoperative alignment and functional recovery.

A-1089 EXPLORING WALANT FOR COMPLEX OPEN WRIST SURGERIES: SAFETY, COMFORT, AND RECOVERY INSIGHTS

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Introduction: Wide-Awake Local Anaesthesia No Tourniquet (WALANT) is well established for soft-tissue hand procedures, offering excellent analgesia, reduced costs, and improved intraoperative participation compared with traditional anesthesia. However, its use in open wrist surgery, which involves deeper dissection and bone manipulation, remains underreported. Evidence on factors influencing tolerance, anesthetic conversion, and early postoperative outcomes in these more complex procedures is limited. Addressing this gap is important for expanding WALANT to a wider range of wrist pathologies and for understanding its role within value-based hand surgery care.

Aim: To evaluate WALANT outcomes in open wrist surgery and determine whether demographic, clinical, surgical, or surgeon-related factors influence intraoperative pain, comfort, anesthetic conversion, recovery room duration, unplanned emergency visits, or willingness to repeat WALANT.

Material & Methods: A prospective cohort of 47 consecutive open wrist surgeries performed under WALANT (2018–2023)

was analyzed. Variables included demographics, smoking status, hand dominance, trauma vs elective indication, fracture pattern, surgical approach (volar, dorsal, combined), surgeon expertise (3 levels), operative duration, VAS pain score, comfort score, recovery room duration, need for anesthetic reinforcement or conversion, early complications, unplanned emergency visits within six weeks, and willingness to repeat WALANT. Statistical analyses included Mann–Whitney U, Fisher's Exact test, Spearman correlation, and Kruskal–Wallis with post-hoc testing ($p < 0.05$).

Results: Median intraoperative pain was VAS 0 (IQR 2) and median comfort score 3 (IQR 1), indicating globally high tolerability. Median recovery time was 96 minutes (IQR 78). Anesthetic reinforcement or conversion occurred in 8.5%, likely related to technical factors such as insufficient anesthetic volume or inadequate waiting time before incision; one conversion occurred during an arthrodesis, a procedure requiring extensive bone manipulation. No demographic or clinical variable—age, sex, smoking, hand dominance, trauma vs elective diagnosis—significantly affected pain, comfort, conversion, recovery, or unplanned visits.

Operative time correlated with recovery duration but not with pain or conversion, suggesting procedural complexity—not WALANT limitations—drives postoperative recovery. Surgical approach showed selective differences: VAS was higher in combined approaches ($p = 0.034$), and recovery was longer in dorsal versus volar exposures ($p = 0.003$), but these differences did not affect conversion or patient acceptance and likely reflect anatomical demands rather than inadequate anesthesia. Surgeon expertise did not influence any WALANT outcome, supporting the reproducibility of the technique once infiltration is standardized.

Willingness to repeat WALANT (76.7%) was strongly associated with lower VAS and greater comfort, highlighting the central role of intraoperative experience in shaping patient acceptance.

Conclusions: WALANT is safe, reliable, and well tolerated for open wrist surgery, providing excellent analgesia, high comfort, and low conversion rates across diverse patient and surgeon profiles. Successful painless motion is central to optimal WALANT wrist outcomes, underscoring the importance of meticulous infiltration. Differences in VAS or recovery among approaches appear to reflect procedural complexity rather than anesthetic limitations. These findings support the broader use of WALANT in complex wrist surgery within value-based care models.

A-1090 GRADUAL FOREARM DISTRACTION AND CENTRALIZATION TO RESTORE AND MAINTAIN LONGITUDINAL BALANCE IN CONGENITAL RADIAL CLUB HAND: A FOUR-CASE SERIES

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Introduction: Congenital radial club hand (CRCH) comprises a spectrum of longitudinal radial deficiencies resulting in radial deviation, carpal malalignment, and characteristic shortening and bowing of the ulna. Surgical reconstruction aims to restore a stable longitudinal axis while preserving mobility and soft-tissue integrity. Acute centralization without corresponding shortening causes extensive tension, increasing the risk of vascular compromise, stiffness, and recurrence. Gradual distraction following forearm osteotomy allows progressive skeletal and soft-tissue adaptation. This series highlights the rationale and technique of a staged protocol consisting of forearm lengthening and simultaneous centralization using a small ring fixator, addressing long-term axial maintenance.

Aim: To report four children treated with the same staged reconstructive protocol - forearm lengthening combined with simultaneous, gradual centralization of the wrist observing five parameters: consolidation time, duration and length of distraction, age at first operation, length of follow-up time, and long-term maintenance of the hand-forearm axis, without including other reconstructions such as pollicization.

Materials & Methods: Four children with Bayne II-IV radial longitudinal deficiencies were operated between 2004 and 2025 and retrospectively reviewed. In three children, gradual distraction and lengthening of the forearm was performed after an ulnar osteotomy and in one Bayne II patient, distraction was performed in two stages after radial osteotomy. A circular external fixator according to the principle of Ilizarov with two to four full or hemi rings was applied in all cases, and distraction proceeded at approximately 1 mm/day until the hand was realigned in a neutral position. Centralization was subsequently performed using trans-ulnocarpal elastic stable intramedullary titan nail (ESIN), except in one child who underwent radial osteotomy and plate fixation. Radiographs were assessed for regenerate formation, cortical bridging, gain of forearm length, and long-term axial alignment. Follow-up ranged from early postoperative assessments to over a decade.

Results: The first stage of surgery was performed at 5 months, 1 year, 2 years, and 4 years of age (median 1.5 years). Radiographic consolidation occurred at 4.5, 5, and 13 weeks in three children (median 5 weeks); the Bayne IV non-union required re-osteosynthesis with plating. Distraction duration ranged from 5 to 13 weeks (median 9.5). Distraction length ranged from 15 to 20 mm (median 16.6 mm). Follow-up ranged from 0.5 to 13 years (median 4 years). All wrists remained centralized throughout the observation period, with no recurrent radial deviation or carpal subluxation. Long-term imaging confirmed stable alignment, regenerate formation, and reliable maintenance of the hand-forearm axis across all Bayne types. Despite variation in deformity severity, implant selection, and treatment decade, biological behavior under the staged protocol was comparable, and no child experienced loss of correction. In contrast to techniques that necessitate shortening to manage soft-tissue tension, this technique facilitates primary forearm lengthening without incurring vascular compromise.

Conclusion: Together, these findings demonstrate that the staged protocol provides consistent biological performance and durable radiographic correction in congenital radial club hand, enabling a stable centralization and safe primary lengthening without vascular compromise.

A-1091 MOTION RESTRICTION IN NON-ACUTE WRIST PAIN

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Introduction: Objective functional measurements are crucial factors in clinical decision making. Chronic limitation of wrist mobility can influence therapeutic outcomes; therefore, range of motion (ROM) assessment can help guiding physicians in choosing adequate therapeutic measures.

Aim: The aim of our study was to assess the restriction of mobility in case of non-acute wrist pain, depending on tenderness location, patient characteristics and the duration of symptoms.

Material & Methods: Prospective data collection was performed between October 2022 and July 2024 at the Hand Clinic, Budapest. Inclusion criteria were adult patients with non-acute wrist pain. Patient characteristics (sex, age), duration of symptoms, ROM, presence of tenderness over the scapholunate ligament (SL) or at the ulnar side of the wrist was recorded.

Results: 144 patients met the inclusion criteria. Of them, 88 (61%) were men and 56 (39%) were women. Wilcoxon Signed Ranks Test showed a significant decrease of the range of motion of the painful side compared to the contralateral side in both flexion: 67.7 ± 19.1 degree compared to 81.8 ± 11.1 (Z-7,494, $p < 0.001$) and in extension: 52.5 ± 18.1 degree compared to 67.1 ± 12.1 (Z-7,844, $p < 0.001$).

The Kruskal-Wallis test showed a significant difference in ROM based on the location of the complaints ($p=0.048$). Patients with combined ulnar and SL pain had the worst range of motion (mean rank = 50.77), while best ROM was observed for patients with ulnar complaints (mean rank=71.07), though the difference was below significance level ($p=0.063$). There was no difference in the rate of restriction of mobility depending on sex or the duration of symptoms. Patients over 50 years had a significantly higher restriction of wrist flexion compared to patients under 30 years ($p=0.013$) or between 30-50 years ($p=0.042$).

Conclusions: Non-acute wrist pain leads to significant motion restriction of the wrist, especially in patients with combined pathologies or who are over 50 years old. Objective evaluation of the functional status can help physicians to assess outcomes and to manage patient expectations.

A-1092 RISK FACTORS FOR WOUND COMPLICATIONS FOLLOWING OPEN REDUCTION AND INTERNAL FIXATION OF PROXIMAL ULNA FRACTURES

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Introduction: Wound complications following open reduction and internal fixation (ORIF) of proximal ulna fractures are challenging to treat and impact recovery. Shoulder stiffness, through the restriction of mobility of the upper limb, is likely contributing to postoperative wound complications.

Aim: The aim of this study was to assess the role of shoulder stiffness and other modifiable and non-modifiable risk factors in the development of postoperative wound complications.

Material & Methods: This multicenter, retrospective cohort study included adult patients who underwent ORIF for proximal ulna fractures and had a minimum of 12 weeks follow-up. Patient, injury, and surgery characteristics were collected and compared between patient groups who had no or minor complications compared to those who had major or recurring wound complications. Major wound complication was defined as a wound complication requiring reoperation, and recurring wound complications were defined as wound complications occurring after reoperation for major wound complication. Variables found to be significantly different in bivariate analysis, as well as predefined variables based on the literature, were assessed using multivariable logistic regression.

Results: Our study included 536 eligible patients. Major wound complications occurred in 28 cases (5.2%), while recurring wound complications were observed in 14 cases (2.6%). Shoulder stiffness tripled the risk of major wound complications (OR: 3.12 (1.12 – 8.63), $p=0.029$), however, it was not a risk factor for recurring wound complications. Among non-modifiable factors, open fracture (OR: 2.79 (1.03 – 7.49), $p=0.042$) was a risk factor for major wound complications, while older age (OR: 1.04 (1.00 – 1.08), $p=0.045$) and increased intraoperative blood loss (OR: 1.92 (1.03 – 3.78), $p=0.040$) were significant risk factors for recurring wound complications. Alcohol abuse was a significant risk factor for both major (OR: 3.11 (1.11 – 8.73), $p=0.029$) and recurring wound complications (OR: 4.52 (1.18 – 17.37), $p=0.028$).

Conclusions: Shoulder stiffness is a potentially preventable cause of wound complications following proximal ulna ORIF. Other identified risk factors including older age, open fracture, increased intraoperative blood loss and alcohol abuse (in the setting of traumatic injury) were not modifiable. Affected patients may need to be monitored closely and extra care should be taken to offload the elbow incision to prevent complications.

A-1093 LATENT MOTOR-IMAGERY PHENOTYPES AND THEIR CLINICAL CORRELATES IN ADULTS WITH UPPER-EXTREMITY DISORDERS

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Introduction: Motor imagery is increasingly used in rehabilitation for hand and upper-extremity disorders. However, patients with similar structural impairments often differ in their ability to generate imagery and show variable responses to imagery-based interventions. It is unclear whether motor-imagery ability forms a continuum or distinct clinical phenotypes. **Aim:** To identify latent motor-imagery profiles in adults with upper-extremity disorders using combined questionnaire-based imagery measures, and to examine how these profiles relate to laterality performance, psychological burden and hand-specific outcomes.

Material & Methods: In a cross-sectional study, 121 adults with diverse upper-extremity problems completed the Movement Imagery Questionnaire-3 (MIQ-3) and the Kinesthetic and Visual Imagery Questionnaire (KGIA-20). Latent profile analysis (tidyLPA, mclust engine in R) was conducted on five imagery indicators: MIQ-3 external, internal and kinesthetic subscales, and KGIA-visual and KGIA-kinesthetic totals. Model fit was compared across 1–5 class solutions; the five-class model showed the most favourable Bayesian Information Criterion (BIC=2324) and high entropy (0.95). The derived classes were compared using Kruskal–Wallis tests on laterality performance (time, accuracy), mental rotation performance, visual and kinesthetic intelligence quotient (IQ), kinesiophobia (Tampa), anxiety and depression (Hospital Anxiety and Depression Scale, HADS), Michigan Hand Questionnaire (MHQ) subscales, and grip and pinch strength.

Results: Five clinically interpretable imagery profiles emerged. Class 5 (n=52) showed very high and balanced imagery, with MIQ-3 means around 6.6 and KGIA scores ≈ 48 on both visual and kinesthetic scales. Class 1 (n=34) had high MIQ-3 scores (~ 5.1 – 5.3) with only moderate KGIA vividness. Class 2 (n=14) combined high MIQ-3 with very vivid KGIA scores (≈ 46 – 47), representing a “representation-strong” phenotype. Class 4 (n=15) showed moderate–low imagery (MIQ-3 ≈ 3.6 – 4.3 ; KGIA ≈ 34 – 35), with slightly better kinesthetic than visual vividness. Class 3 (n=6) had very low imagery across modalities (MIQ-3 internal 1.29 ± 0.60 ; KGIA-visual 13.67 ± 5.13). Clinically, the moderate–low imagery profile (Class 4) was the most vulnerable. This group had the lowest laterality accuracy ($\chi^2(4)=10.42$, $p=0.034$), highest kinesiophobia ($\chi^2(4)=14.66$, $p=0.005$), higher HADS-anxiety ($p=0.011$) and HADS-depression ($p=0.026$), weaker tripod pinch ($p=0.038$), and worse MHQ function ($p=0.048$), activities of daily living ($p=0.014$), aesthetics ($p=0.003$) and satisfaction ($p=0.050$) compared with the other classes. In contrast, the very-high balanced imagery class (Class 5) and the high-imagery/very vivid class (Class 2) showed better hand outcomes and higher visual and kinesthetic IQ scores (visual IQ $\chi^2(4)=13.68$, $p=0.008$; kinesthetic IQ $\chi^2(4)=11.24$, $p=0.024$). Laterality time did not differ between classes ($p=0.261$), suggesting that imagery phenotype is more closely related to accuracy and psychosocial load than to simple processing speed.

Conclusions: Motor-imagery ability in adults with upper-extremity disorders is not homogeneous but clusters into at least five reproducible phenotypes defined by overall imagery level and vividness. The clinically most burdened group was not the very-low imagery minority but the larger moderate–low imagery profile with elevated fear of movement, anxiety and depression and poorer hand-related outcomes. These findings support routine screening of imagery ability, laterality accuracy and kinesiophobia before prescribing motor-imagery-based rehabilitation, and indicate that patients in the moderate–low imagery profile may require preparatory graded imagery and fear-reduction modules before task-specific imagery is introduced.

A-1094 DIMENSIONALITY AND RELIABILITY OF THE MOVEMENT IMAGERY QUESTIONNAIRE-3 IN ADULTS WITH UPPER-EXTREMITY DISORDERS

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Introduction: The Movement Imagery Questionnaire-3 (MIQ-3) is widely used to quantify visual and kinesthetic motor imagery in clinical and sports settings. Its original development study supported a three-factor structure (internal visual, external visual, kinesthetic).

Aim: To examine the structural, reliability and known-groups validity properties of the MIQ-3 in adults with upper-extremity disorders and to determine whether a unidimensional or three-factor representation is more appropriate in this population. **Material & Methods:** A total of 121 adults with diverse upper-extremity disorders (soft-tissue, peripheral nerve and fracture-related diagnoses) and 38 healthy controls completed the 12-item MIQ-3. Demographic and clinical characteristics of the patient cohort were recorded (median age 26.90 years; 71.1% female). Confirmatory factor analysis (CFA) first tested the original three-factor model in the patient sample (n=121). Because fit indices were unsatisfactory, exploratory factor analysis (principal components) and a subsequent one-factor CFA were performed. Internal consistency, test–retest reliability (two-way mixed intraclass correlation coefficient and Spearman correlation) and Bland–Altman agreement were evaluated on repeated measurements in a subsample. Known-groups validity and discriminant validity were examined by contrasting patients and controls and by receiver operating characteristic (ROC) analysis for the MIQ total score.

Results: The original three-factor MIQ-3 model showed poor fit in this clinical sample (final three-factor CFA: CMIN/df 4.903; CFI 0.874; GFI 0.765; TLI 0.830; RMSEA 0.180). In contrast, exploratory factor analysis yielded a single component with an eigenvalue of 8.59 explaining 71.6% of the variance, with all items loading strongly (0.81–0.87). One-factor CFA demonstrated excellent fit (CMIN/df 1.787; CFI 0.979; GFI 0.911; TLI 0.966; RMSEA 0.081). Internal consistency for the 12-item total score was excellent (Cronbach's alpha 0.963). Test–retest reliability was good-to-excellent (ICC 0.870; 95% confidence interval 0.746–0.936; $F(29,29)=14.439$; $p<0.001$; Spearman $\rho=0.731$; $p<0.001$), with Bland–Altman analysis indicating no systematic bias and narrow limits of agreement. MIQ-3 total scores discriminated patients from controls (Mann–Whitney U, $p<0.001$), and ROC analysis showed fair discrimination for the presence of upper-extremity pathology (area under the curve 0.693; standard error 0.045; 95% confidence interval 0.605–0.780; $p<0.001$).

Conclusions: In adults with upper-extremity disorders, the MIQ-3 behaves as a highly reliable, essentially unidimensional instrument. The three-factor structure proposed in the original development work does not provide acceptable model fit in this setting, whereas a single-factor solution yields excellent structural validity. These findings support the use of the MIQ-3 total score as the primary imagery metric when screening patients for motor-imagery-based rehabilitation and when integrating MIQ-3 into multivariable models in upper-extremity outcome research.

A-1095 ADVANCING MICROSURGICAL TRAINING: A MULTI-CENTRE PILOT VALIDATION STUDY COMPARING A NOVEL SYNTHETIC BLOOD VESSEL SIMULATOR TO CHICKEN-THIGH MODELS

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Introduction: High-fidelity, accessible microsurgical training is essential for developing competent trainees, yet traditional chicken-thigh models are limited by variability, ethical and logistical challenges.

Aim: This pilot, multi-centre study aimed to evaluate a novel biomimicking synthetic blood vessel (SBV), constructed from hydrogel, as an alternative model, with the aim of improving microsurgical training.

Material & Methods: 11 microsurgeons (consultants and senior registrars) from four centres each performed one end-to-end microvascular anastomosis on our SBV and a chicken-thigh vessel under an operating microscope. Immediately post-anastomosis, surgeons completed a structured assessment evaluating each compared to real human anatomy. Qualitative feedback captured strengths, limitations, and educational utility.

Results: SBVs were rated significantly higher for ease of use (mean 4.18 vs 3.36) and convenience (4.73 vs 2.36), with surgeons highlighting consistent vessel quality, hygienic handling, and simpler setup. Tactile feedback, needle-glide, and cheese-wiring were equivocal between models. Chicken-thigh vessels scored higher for vessel-approximation (4.45 vs 3.91) but were criticised for variable calibre, time-intensive preparation, ethical and hygiene concerns. Across centres, assessments showed no significant inter-site differences, supporting reproducibility. Overall, SBV provided consistent, user-friendly simulation experiences well-suited to structured microsurgical curricula.

Conclusions: This pilot study demonstrates that SBV is a non-inferior, practical alternative to chicken-thigh vessels for microsurgical training. It offers clear advantages in logistics and reproducibility, positioning it as a scalable model for early microsurgical education. A national expansion is underway, to refine the simulator and evaluate its impact on trainee progression and longitudinal skill acquisition. Updated results will be presented.

A-1096 RECONSTRUCTION OF ZONE 2 CHRONIC FLEXOR TENDON INJURIES: IMPACT OF WIDE-AWAKE LOCAL ANESTHESIA (WALANT) ON FUNCTIONAL OUTCOMES

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Introduction: Chronic flexor tendon injuries in zone 2 remain one of the most demanding reconstructive challenges in hand surgery. Although various techniques—from single-stage repair to multi-stage autologous tendon grafting—have been described, functional outcomes are often unpredictable. WALANT allows real-time assessment of active tendon gliding and suture integrity, potentially optimizing intraoperative decision-making. This study evaluates the impact of WALANT compared with plexus anesthesia in chronic zone 2 flexor tendon reconstruction.

Materials and Methods: We conducted a retrospective review of 50 patients treated for chronic zone 2 flexor tendon injuries. Patients were divided into two groups according to anesthesia: plexus anesthesia (n=29) and WALANT (n=21). Thirteen patients underwent direct FDP repair while 37 underwent two-stage Hunter reconstruction. Functional outcomes were assessed using the Strickland system. A total of 50 patients (53 digits) treated between 2003 and 2023 were included. Mean age: 38.7 ± 11.4 years; 62% male. Plexus anesthesia: 29 patients; WALANT: 21 patients. Direct FDP repair: 13 patients; Hunter two-stage reconstruction: 37 patients. Mean delay from injury: 7.8 ± 2.3 weeks. Mean follow-up: 14.6 ± 5.2 months.

Results: Despite the small sample size, WALANT was associated with a higher proportion of excellent Strickland results in two-stage reconstructions. A similar trend was observed in direct repairs, though without statistical significance. Strickland Outcomes: - Excellent: WALANT 48% vs plexus 21% ($p=0.031$) - Good: WALANT 33% vs plexus 31% ($p=0.87$) - Fair/Poor: WALANT 19% vs plexus 48% ($p=0.044$). Subgroup Analysis: - Two-stage Hunter: Excellent 52% WALANT vs 23% plexus ($p=0.028$) - Direct repair: Excellent/Good 62% WALANT vs 46% plexus ($p=0.41$). Recovery time: - WALANT: 9.2 ± 2.1 weeks - Plexus: 11.8 ± 2.9 weeks ($p=0.004$)

Multivariate logistic regression:

- WALANT independently predicted Excellent/Good outcome ($OR=3.21$; 95% CI 1.12–9.14; $p=0.029$)

Conclusions: In chronic zone 2 flexor tendon reconstruction, WALANT appears to enhance functional outcomes by enabling intraoperative adjustment based on active tendon gliding. Our 20-year experience supports its broader adoption in reconstructive flexor tendon surgery.

A-1097 MANAGEMENT AND OUTCOMES OF IATROGENIC RADIAL NERVE LESIONS AT ARM AND FOREARM LEVEL: ANALYSIS OF 18 MIXED/MOTOR NERVE INJURIES

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Introduction: The overall incidence of iatrogenic nerve injury after surgical treatment of HSF is generally estimated to be between 4% and 32% in the literature; 5 to 8 % in the forearm in the terminal branches of the radial nerve (Posterior Interosseous Nerve). Causes are not only fractures but also tumor removal and distal biceps repair. These patients must be treated in specialised centres. The results of reconstructions performed within a reasonable time frame are almost always satisfactory.

Aim: The study aims to describe the possible complications of orthopedic or plastic surgery procedures that damage the radial nerve, understanding how to diagnose and when to intervene. In particular, we explain through our case studies how we behaved, in what circumstances, and what results we achieved.

Materials and Methods: We present a case series of 18 mixed or motor nerves (NIP) (we do not deal with iatrogenic lesions of the radial sensory nerve, which belong to another chapter) that we have treated over time for iatrogenic lesions. Half of these, 9, are of the radial nerve in the arm due to reductions and fixation of humeral fractures (plates, pins, K-wires, external fixators); all causes are analysed; the other 9 involve the posterior interosseous nerve in the forearm or its terminal branches due to fracture reductions, removal of benign neoplasms (2), distal biceps reinsertions (2) or reductions of fractures/dislocations of the proximal radius/radial head prostheses (5). We will show how many times we reconstructed with grafts (80%) and the results of these nerve reconstructions. In distal lesions of the posterior interosseous nerve ("cauda equina" of the nerve) the repair was not possible and we preferred to perform immediate tendon transfers. We tested our results with the MRC scale.

Results: 90% of nerve graft repairs achieved a result of M4 or higher. Only in two cases did we have an unsatisfactory result after grafting (M0 in one case and M3 in another), which we then had to treat with palliative surgery. The results of the tendon transfers will be shown case by case and are all stated as satisfactory results.

Conclusions: If treated correctly and with the correct timing the results are good. Early identification of severe lesions is crucial for prognosis and outcome, as there is a limited timeframe for effective reinnervation. Delay in referral to a specialist center still remains a significant issue. Failure to initiate surgical treatment when recovery is not progressing as expected (e.g., waiting 3–4 months for spontaneous recovery before considering intervention for severe axonal lesions)

becomes a critical decision point that can be scrutinized in a medico-legal context. The assessment of iatrogenic nerve injuries (INIs) involves significant medico-legal considerations related to patient safety, risk disclosure, and liability, driven by the profound consequences these injuries impose. The use of ultrasound during presurgical planning is recommended to identify the exact anatomical course of nerves. This method can help minimize the incidence of iatrogenic nerve injury, which, in turn, can significantly reduce the burden of litigation.

A-1098 PROSTHETIC ARTHROPLASTY OF THE PROXIMAL INTERPHALANGEAL JOINT USING A SURFACE REPLACEMENT IMPLANT WITH A MINIMUM FOLLOW-UP OF 7 YEARS: A RETROSPECTIVE STUDY

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Introduction: Promising results regarding range of motion, correction of axial deformation and pain have been reported for the new generation of surface replacement (SR) implants of the proximal interphalangeal joint (PIP-joint).

Aim: The purpose of this study was to evaluate whether the good short-term results deteriorated over time or were constant. As a secondary research question the long-term complication rate was investigated.

Material & Methods: Between 2014 and 2019 44 PIP-joints were operated for primary osteoarthritis using a modular surface replacement (CAP Flex prosthesis, [KLS Martin]). In cases with severe axial deformation the collateral ligament was enforced after prosthesis implantation.

Patients were followed up regularly and a final follow up was done at least 7 years postoperative. Considered parameters were range of motion, pain during rest and activities of daily life (ADL) on the visual analogue scale (VAS) and axial deformation.

Additionally radiographs were examined for signs of migration or loosening

Results: A total of 35 joints were available for follow-up after a mean time of 7,3 years. The median active range of motion preoperatively was 50°. This initially improved to 70° and was 65° at the time of final follow-up. Pain during rest and ADL was a median of 0 on the VAS at final follow-up. The axial deformation improved from 10° ulnar deviation (UD) preoperative to 2° postoperative and 4,5° at the time of final follow-up. No prosthesis showed signs of loosening or migration. A total of three prosthesis had to be explanted due to ongoing pain and changed to arthrodesis which resembles a revision rate of 7%.

Conclusions: Prosthetic arthroplasty of the PIP-joint with a modern SR implant of the 3rd degeneration can provide a reliable reduction of pain while preserving a decent range of motion. Especially the range of motion is constant over the time. Axial deformities can be persistently corrected.

The low rate of complications over the long-term period and the absence of secondary loss of motion compared to the earlier results of SR implants make it a good alternative to the popular silicone implants.

A-1099 GREEN HAND SURGERY: A SYSTEMATIC REVIEW OF SUSTAINABLE PRACTICES GLOBALLY

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Introduction: Healthcare generates 4.4% of global greenhouse gas emissions, with operating rooms producing up to 70% of hospital waste. Hand Surgery is a significant contributor through high energy use, single-use materials, anaesthetic

gases and water consumption. The Lean and Green Initiative, promotes WALANT (Wide Awake Local Anaesthesia No Tourniquet), minor field sterility, and minimal surgical packs to reduce cost and waste while maintaining safety and satisfaction. This requires systemic change across people, work, culture and structure, supported by education and behavioural interventions. Green Hand Surgery aligns with global decarbonisation goals and UK NHS Net zero targets. It positions Hand Surgeons to lead the transition toward greener, value-based and ethical healthcare.

Aim: We aimed to perform a systematic review of current evidence evaluating the environmental, economic, and clinical impacts of sustainable practices in hand surgery.

Material & Methods: We conducted an evidence synthesis in compliance with Preferred Reporting Items for a Systematic Review and Meta-analysis (PRISMA). A search strategy identifying relevant studies was performed using EBSCO through the available databases for green hand surgery. A qualitative review of the data addressing carbon emissions, waste generation, water use, and cost was performed. Procedures included carpal tunnel release, trigger finger release, Dupuytren's procedures, ganglion surgeries and minor trauma cases.

Results: We identified 16 studies (2015–2025) encompassing over 700 procedures, and 600 patients. The majority were carpal tunnel releases (CTR). We noted that performing CTR under WALANT in a clinic setting generated 0.7 kg of waste and 8.3 kg CO₂-eq per case, compared with 4.6 kg waste and 41.6 kg CO₂-eq in hospital operating rooms—a reduction of approximately 80% in emissions and 85% in solid waste. Reformulating surgical packs for WALANT procedures produced a 53% per-case cost reduction (\$92.83 → \$43.40) and 41% less waste (4.9 kg → 2.9 kg), saving \$2,246 and 94 kg of waste over 7 months. In the US, the 2015 “Lean and Green” initiative saved \$10–\$90 per case and cut waste by 5 kg without raising infection risk. Additionally, recycling minimal-pack programs saved approximately US \$41,800 annually. Furthermore, alcohol-based hand rubs eliminated up to 70% of water use, equivalent to 2.7 million L annually in a large hospital, and reduced material costs by 67%, while the Neptune GREEN study reported a 98.5% waste reduction in fluid disposal. Global analyses identified anaesthetic gases, single-use plastics, and energy consumption as the largest contributors to operative emissions, while education and multidisciplinary “green teams” were most effective for implementation.

Conclusions: Sustainable hand surgery practices—anchored in WALANT, lean surgical kits, waste segregation, and water-efficient antisepsis—achieve substantial reductions in cost, waste, and carbon output while preserving safety and outcomes. Transitioning high-volume hand procedures from operating rooms to clinic settings could lower emissions by over 75% and generate major financial savings. Integrating sustainability education, data monitoring, and institutional policy reform is essential to embed these practices within modern surgical care.

A-1100 “MORTON-LIKE” DIGITAL NEUROMA OF THE THUMB: AN UNCOMMON ETIOLOGY OF DIGITAL NEUROPATHY
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Introduction: Digital neuromas most commonly arise from acute traumatic injuries, typically penetrating in nature and associated with nerve transection. Although less frequent, they may also develop in the absence of overt nerve laceration, arising instead from chronic compression, repetitive friction, or long-standing mechanical irritation.

Aim: To describe a rare case of a digital nerve neuroma resulting from long-standing mechanical compression by an osteophyte and to emphasize the clinical relevance of this under-recognized etiology of digital neuropathic pain.

Material & Methods: Review of clinical records and of the most recent literature on the subject.

Results: A 68-year-old woman with no relevant medical history presented with a recently developed, progressively

enlarging soft mass on the ulnar aspect of the left thumb's interphalangeal region. She reported neuropathic-type pain and reduced sensation along the ulnar border of the thumb. Her history included an occupational injury to the same thumb 30 years earlier, with no symptoms in the intervening period.

Radiographs showed prominent exostoses at the base and head of the proximal phalanx. MRI demonstrated a well-defined, non-contrast-enhancing subcutaneous nodule, measuring 45×23 mm, over the ulnar side of the distal interphalangeal region.

Intraoperatively, a soft white-yellowish mass was found closely associated with the ulnar dorsal digital branch of the thumb, without evidence of nerve transection or intraneural damage. The lesion was fully excised to a markedly proximal level, after which the residual nerve stump was implanted into the underlying muscle. The osteophytes were also removed. Histology revealed organized concentric perineural scar formation with interfascicular fibrosis.

The postoperative course was uneventful, with satisfactory wound healing. The patient retains mild residual hypoesthesia but is pain-free and functionally improved.

Conclusions: This case highlights an atypical "Morton-like" neuroma of the thumb, likely resulting from chronic mechanical irritation by an osteophyte. Histologically, the perineural fibrosis resembled a "Morton-type" pattern, which differs from the disorganized axonal and Schwann-cell proliferation typically found in traumatic neuromas. Bony irregularities or osteophytes acting as chronic irritative stimuli for digital neuroma formation are exceedingly rare. Awareness of this mechanism is essential for accurate diagnosis and appropriate management as symptoms may emerge insidiously and imaging may be inconclusive.

A-1101 ARE DYNAMIC EXTERNAL FIXATION DEVICES FOR PROXIMAL INTERPHALANGEAL JOINT (PIPJ) FRACTURES STILL APPROPRIATE? A REGIONAL HAND UNIT COHORT STUDY

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Introduction: Proximal interphalangeal joint (PIPJ) fracture account for 10-20% of hand fractures. They are complex and require careful fixation strategy considerations. With the advent of new techniques and fixation devices, there is a range of fixation options available dependent on the PIPJ fracture pattern. The use of a dynamic fixator device allows preservation of soft tissue integrity, restoration of joint surface congruence and allows for post-operative mobilisation thus remaining a mainstay in the treatment of PIPJ fractures.

Aims: Our primary objective is to evaluate the outcomes of dynamic fixation in the different PIPJ fracture patterns (Pilon and volar fragment with dorsal dislocations). Moreover, we aim to assess how the range of motion (ROM) in the immediate post-operative period affects the final ROM once the device is removed, as well as the associated complications.

Material & Methods: A retrospective cohort study was performed of all consecutive patients sustaining a PIPJ fracture over the last 3 years at our regional hand unit. Patient demographics, mechanism, fracture pattern, time to surgery, ROM, and radiograph findings were collected. Long-term ROM was compared to fracture pattern using Point-Biserial calculation and Pearson's correlation coefficient analysis was performed to determine the relationship between the immediate post-operative ROM with the final outcome.

Results: 24 patients were identified, mean age 45.7 (17-77), 14 males, with a mean time to surgery of 7 days (2-16). The devices were kept for 28-49 days, and the patients were followed up for 6 months on average. The 2 main categories of fracture pattern were: pilon (n=11), volar buttress with dorsal dislocation (n=13). Pilon fractures had a better final ROM compared to volar buttress fractures ($r=0.3$). The ROM in the immediate post-operative period had a positive correlation

to the final ROM, $R=0.7257$, $p=0.0001$. 2 patients required tenolysis at 1-year post-operatively and 1 patient developed a superficial soft tissue infection requiring antibiotics and removal of frame at 4 weeks post-operatively.

Conclusions: Our study validates the use of dynamic fixation preferentially for PIPJ pilon fractures. The final post-operative ROM is very good given the opportunity for joint mobilisation. The positive correlation between the immediate mobilisation of the PIPJ and the final ROM is important as it highlights the need for early hand therapy intervention, encouraging movement and thus, instilling a sense of control for the patient over their recovery journey. Moreover, the predictive value of the final ROM based on the degree of mobilisation with the frame on, allows for a tailored management of patients in the early recovery period, whereby further interventions can be planned within an acceptable window of opportunity, if required.

A-1102 MANAGEMENT OF POST.-TRAUMATIC STIFFNESS IN PRONOSUPINATION

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Introduction: Limitation of pronosupination can be due to several causes at proximal of distal radio-ulnar joint. It is an impairing pathology and may be caused by post-traumatic wrist conditions as malunited distal radius or ulnar fractures, calcification HO (Vince and Miller type 1), synostosis, distal radio-ulnar joint fibrosis, or osteoarthritis. To identify the pathology Xrays, CT scan and/or MRI scan pre-operatively are necessary

The aim of this study is to report the results of treatment of a series of patients affected by several post-traumatic wrist pathologies in order to obtain restoration of pronosupination

Materials and Methods: We have treated 16 patients with post-traumatic limitation of pronosupination

All were males, mean age 44yo (21 - 63). There were 11 malunited DRF (treated by corrective open wedge osteotomy), 1 HO (removal and fascia interposition), 3 arthrofibrosis (Radicarpal and DRUJ arthrolysis), 1 arthritis treated by ulnar head implant (Herbert).

All patient had a limitation of pronosupination, mean pre-operative pronosupination was 30° (range 0° - 65°). Preoperatively mean DASH was 45, mean PRWE 38, mean VAS 6.6.

Patients were evaluated at a mean follow up of 28 months (11- 37) by clinical examination, Xrays, Mayo wrist score, DASH, PRWE, VAS scores.

Results: According to Mayo score 12 patients had an excellent result, one patient had a good result, with still 20° limitation of supination (after DRUJ arthrolysis). Mean Dash score was 15, mean PRWE 13, mean grip strenght 43 Kg (comparable to contralateral). VAS 0.7, ROM in pronosupination was improved in all cases to a mean of 165° (range 125° - 160°), this was statistically significant compared to pre-operative values ($p<0.01$)

Conclusions: In order to restore prono-supination it is important to identify the cause of limitation which is not always clear. Clinical examination, diagnostic examination as Xrays, CT and MRI scan are useful to identify the pathology and plan the surgical treatment. The correct identification of the cause and the appropriate surgical treatment leads to the restoration of function.

A-1103 THUMB CMC JOINT REPLACEMENT OUTCOMES AND SURVIVORSHIP: A SINGLE CENTRE 10-YEAR RETROSPECTIVE COHORT STUDY

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Introduction: Optimal thumb function relies on a finely regulated balance between skeletal stability, joint congruency, ligamentous support and muscular forces. Osteoarthritis of the carpometacarpal (CMC) joint disrupts this equilibrium, leading to pain, weakness, and impaired pinch mechanics. Joint replacement aims to re-establish functional balance by preserving thumb length, maintaining trapezial–metacarpal alignment, and restoring harmonious load transfer across the thumb. Although thumb base arthroplasty has gained popularity as an alternative to trapeziectomy, long-term outcomes and complication profiles remain variable in the literature. This study evaluates the survivorship, complications, and patient-reported outcomes after CMC joint replacement over a 10-year period at a single centre.

Aim: To review complication rates, survivorship and satisfaction after thumb CMC joint replacement surgery.

Material & Methods: Data was collected retrospectively from an online database of all patients who underwent a thumb CMC joint replacement at our centre over a 10-year period with over 1 year follow up. This included any complications and returns to theatre. Patients were also contacted and asked pre and postoperative pain scores, satisfaction with having had the surgery and about any complications treated elsewhere.

Results: 242 thumb base replacements were carried out over the 10-year period on 190 patients. Mean age at surgery was 58 years old (range 39 to 73). There were 52 complications (21.5%) including 14 dislocations, 10 cases of CRPS, 8 of Quervain's tenosynovitis, 6 nerve irritations / numbness, 3 carpal tunnels, 3 trigger thumbs, 2 infections and 2 Trapezial fractures. 27 patients (11.2%) had to return to theatre due to their complications and 10 underwent revision surgery, 5 had Trapeziectomies, 3 open reductions and 2 trigger releases. 1-, 3-, 5- and 10-year survivorship was found to be 98%, 93%, 89% and 85% respectively. Mean pre-operative pain was 7.9/10 (range 2 to 10) and post-operatively was 0.7/10 (range 0 to 7). 93% were back to their normal activities of daily living and 89% back to their usual hobbies. Mean satisfaction for having had the surgery was 9.1/10 (range 0-10).

Conclusions: Thumb CMC joint replacement provides excellent long-term pain relief, high patient satisfaction, and good functional recovery, with the majority of patients resuming normal daily activities and hobbies. Although the overall complication rate was 21.5% and 11.2% required further surgery, implant survivorship remained high, with 85% survival at 10 years. These findings suggest that thumb CMC joint replacement is a reliable surgical option, though patients should be counselled about potential complications.

A-1104 DEFICIT OF THE PIP JOINT: FROM ASSESSMENT TO TREATMENT, EVIDENCE-BASED INSIGHTS

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Introduction: Proximal interphalangeal (PIP) joint stiffness is a common complication following diverse injuries, including fractures of the proximal (P1) or middle phalanx (P2), pulley, tendon, collateral ligament or volar plate injuries and/or capsulitis. Post-immobilization or post-traumatic changes exacerbate mobility deficits. The main clinical consequences are joint stiffness and edema, which can limit tendon gliding and functional recovery.

Recent studies highlight multiple approaches to management. Despite these advances, PIP joint stiffness remains a challenging problem. Richter (2023) emphasizes that this articulation is among the most complex to manage due to

its intricate anatomy and tendency for long-lasting mobility deficits [1]. Moreover, Punsola-Izard et al. (2025) report considerable variability in treatment approaches and outcome measures, highlighting the need for standardized protocols and evidence-based rehabilitation frameworks [2]. This underscores the clinical dilemma: determining how long and to what extent recovery of full active and passive range of motion is achievable.

Early and repeated assessment is essential. Tests should be applied at baseline and follow-ups (weeks 1, 4, 8, 12) to differentiate between tendon adhesions and capsular/joint stiffness. Key tools include tendon-gliding evaluation, goniometry, grip strength measurement (Jamar), pain scales (VAS), functional scales (QuickDASH), ultrasound

Aim: The aim is to present the common clinical patterns of PIP joint mobility deficits and explore:

- assessment strategies and differential diagnosis
- conservative and adjunctive therapeutic interventions
- expected outcomes and recovery trajectories
- the overarching question: how long can therapists reasonably work to recover complete flexion-extension in the PIP joint?

Material & Methods: 5 several clinical cases with active and passive PIP flexion-extension deficits were examined.

Assessment included:

- Grip strength: Jamar dynamometer
- Range of motion: goniometry
- Pain evaluation: VAS
- Functionality: QuickDASH
- Edema observation

Interventions included functional splints, targeted exercises, electrical stimulation, percutaneous electrolysis for adhesions, and coordination with physiotherapists for adjunctive treatments.

Results: All cases showed improvements in PIP mobility, though none achieved full restoration comparable to the contralateral finger. Reductions in edema and pain were consistently observed, and functional improvements allowed greater autonomy in daily life, work, and recreational activities. Continued rehabilitation was pursued in selected cases to maximize outcomes. Splints significantly contributed to maintaining gains.

Conclusions: PIP joint mobility deficits remain a frequent clinical challenge due to:

- the heterogeneity of underlying pathologies
- patient-specific factors such as age, occupation, and adherence
- anatomical complexity of the joint

Achieving acceptable outcomes requires:

- strong patient compliance with home exercises
- collaborative planning between therapists and hand surgeons
- continuous professional development and interdisciplinary exchange

Despite ongoing advancements, the duration and extent of recovery for complete flexion-extension remain uncertain, highlighting the need for individualized treatment plans and evidence-based protocols.

A-1106 CORRECTION OF SEVERE WRIST AND ELBOW FLEXION DEFORMITIES IN SPASTICITY AND SCLERODERMA: ACUTE RECONSTRUCTION VERSUS GRADUAL EXTERNAL FIXATION

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Introduction: Severe spastic flexion deformities of the wrist and elbow are difficult to manage, particularly in patients with long-standing spasticity or scleroderma, where rigid contractures and compromised soft tissues limit conventional surgical options. Both acute and gradual correction techniques have been advocated, but comparative clinical experience remains limited.

Aim: To present our experience and compare the outcomes of acute correction and gradual external fixator–assisted correction in the management of severe spastic wrist and elbow flexion deformities.

Material & Methods: Patients with severe wrist and/or elbow flexion deformities secondary to spasticity or scleroderma were managed using two surgical approaches. The first involved acute correction with a combination of selective neuroectomy, Z-plasty soft-tissue releases, tendon transfers, and wrist procedures including proximal row carpectomy or wrist arthrodesis. The second approach utilized gradual deformity correction with an external fixator, primarily in scleroderma patients to accommodate poor soft-tissue quality. Clinical outcomes, deformity correction, and procedure-related complications were evaluated.

Results: Both surgical approaches achieved satisfactory deformity correction and improved limb positioning. Gradual correction with external fixation was particularly effective in scleroderma cases, allowing controlled correction without soft-tissue compromise. Acute correction provided reliable results in selected spastic deformities. Final outcomes were comparable between the two methods, with no significant difference in correction or functional positioning. Complications were minimal and manageable.

Conclusions: Both acute reconstruction and gradual external fixator–assisted correction are effective strategies for managing severe spastic wrist and elbow flexion deformities. Patient selection based on deformity severity and soft-tissue condition is essential, with gradual correction offering a safe alternative in scleroderma and other high-risk soft-tissue conditions.

A-1107 CLINICAL CASE: EXTRA-ARTICULAR DISTAL RADIUS AND ULNA FRACTURE IN A PEDIATRIC ICE HOCKEY ATHLETE

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Introduction: Ice hockey is among the most widely practiced sports in Switzerland, from childhood to professional levels. Due to the nature of the sport and its playing environment fractures are common. A recent 20-year analysis by Dinh et al. reported that, among 258,302 ice hockey–related injuries, 35.57% involved the upper extremity. The wrist accounted for 19.55% of these injuries, and fractures were the most common type (35.85%). Youth players aged 5–13 years had significantly higher odds of sustaining fractures (OR 1.78).

In this case, a child sustained an extra-articular distal radius and ulna fracture. The radius fracture was surgically treated with K-wires, while the ulna fracture was managed conservatively. Initially, a postoperative cast was applied, later replaced with a thermoplastic orthosis to allow improved monitoring of skin condition, edema, and K-wire status, as well as to promote better finger mobility and facilitate vascular and neurological assessment.

A structured, progressive rehabilitation program followed the immobilization phase. Functional exercises using ice hockey equipment, on-field observation of the child during sport practice, check videos where the therapist could remotely monitor the child and provide therapeutic strategies and continuous collaboration with the surgeon and family—as essential members of the multidisciplinary team—were critical to achieving the desired outcomes.

The child will continue follow-up assessments in the coming months to ensure long-term quality of results and address any potential complications such as pain or functional deficits.

Aim: Our objective is to present to the community of hand therapists and surgeons a complex case involving a pediatric ice hockey player, highlighting the surgical and therapeutic possibilities that can lead to positive outcomes and a promising athletic future for the child, particularly concerning the functional recovery of the left upper limb.

Material & Methods: Hand Therapist (n = 1): Specialist in hand rehabilitation. Patient (n = 1): Pediatric athlete undergoing complex rehabilitation. Surgeon (n = 1): Specialist in hand surgery. Assessments included: Pain: Visual Analog Scale (VAS 0–10). Range of Motion (ROM): Goniometric measurement of elbow and wrist. Strength: Grip and pinch strength using standard dynamometers. Function: Patient-reported functional measures (PRWE/QuickDASH adapted for age). Sport autonomy: Clinical evaluation of sport-specific tasks and return-to-play readiness

Results: Elbow, wrist and fingers range of motion was fully restored. Functional recovery and return to sport practice are currently complete, despite a progressive approach due to pain and apprehension experienced by the patient.

Conclusions: In this case, working closely with the child, parents, coach and teammates proved essential. Their support facilitated a gradual and psychologically safe return to sport. For many children, sport and club environments foster personal expression and psychophysical development. For hand therapists, achieving a full return to athletic participation represents a significant challenge and a highly meaningful goal.

Specialized, evidence-based therapeutic guidance combined with strong patient compliance—brings us closer to achieving satisfactory outcomes in complex pediatric cases.

A-1108 COMPARISON OF 3D-PRINTED AND THERMOPLASTIC SPLINTS ON PAIN, STRENGTH, AND SATISFACTION IN CARPOMETACARPAL OSTEOARTHRITIS: A PILOT STUDY

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Introduction: Carpometacarpal (CMC) joint orthoses are commonly used in the conservative management of pain and instability. According to Colditz's biomechanical principles, an optimal orthosis should immobilize the CMC joint while allowing free motion of the thumb metacarpophalangeal joint to preserve functional pinch and grasp. Recent advancements in three-dimensional scanning and additive manufacturing enable the production of orthoses with customized fit and regulated stiffness. However, comparative data among thermoplastic, rigid printed, and flexible printed orthoses remain limited.

Aim: The aim of this pilot study was to compare short term changes in pain, grip strength, pinch strength, and patient satisfaction among three CMC orthosis designs fabricated using low temperature thermoplastic, three dimensional printed polylactic acid (PLA), and three dimensional printed thermoplastic polyurethane (TPU).

Material & Methods: Fifteen participants with symptomatic CMC joint pain were included and divided into three groups of five, with each group receiving one type of orthosis. All orthoses were fabricated using a standardized design that fully immobilized the CMC joint while allowing free thumb metacarpophalangeal joint motion. The thermoplastic group received a custom molded orthosis fabricated from low temperature material. Three-dimensional scanning was used

for the PLA and TPU orthoses to obtain digital hand models for customized design, and the final splints were fabricated using fused deposition modeling (FDM) 3D printing with PLA and TPU filaments. Pain intensity was measured using a visual analog scale. Grip strength was assessed using a hydraulic dynamometer, and pinch strength using a mechanical pinch gauge. Patient satisfaction was recorded using the QUEST questionnaire. Measurements were performed twice, first at baseline and then after a four-week intervention period for each orthosis.

Results: Mean pain scores improved in all groups, decreasing from 6.4 to 4.0 in the thermoplastic group, from 6.0 to 3.6 in the PLA group, and from 5.8 to 3.4 in the TPU group. Grip strength showed small improvements across all groups, increasing from 21.0 to 22.0 kilograms in the thermoplastic group, from 22.0 to 23.2 kilograms in the PLA group, and from 22.2 to 23.4 kilograms in the TPU group. Pinch strength improved from 2.4 to 3.0 kilograms in the thermoplastic group, from 2.6 to 3.2 kilograms in the PLA group, and from 2.8 to 3.2 kilograms in the TPU group. Patient satisfaction values indicated the highest satisfaction with the TPU orthosis (4.55), followed by the thermoplastic orthosis (4.33), while the PLA orthosis showed the lowest satisfaction score (3.91).

Conclusions: This pilot study suggests that all three orthosis types reduced pain and improved strength, with the highest patient satisfaction observed in the TPU group. These preliminary findings indicate that material and fabrication method may influence patient-reported experience, and larger controlled studies are needed to confirm these results.

A-1109 SCAC WRIST : A SEPARATE ENTITY

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Introduction: Often in literature and clinical practice there is a overlap in the features of autoimmunity and autoinflammation diseases some 'mixed-pattern' as pseudogout (Calcyum Pirophosphate Dyhydrate Deposition Disease – CPPD), which lead to more accelerated arthritis. CPDD is a common, often un-recognized form of acute and chronic arthritis, often associated with OA, gout, RA and hyperparathyroidism and frequently mistaken for post-traumatic or primary osteoarthritis.

Clinical presentation may range from being asymptomatic (occasional) to symptomatic acute or chronic inflammatory arthritis

Aim: Establish that SCAC is a different entity from SLAC III that is to say that there are two types SL joint involvement. The first without scaphoid rotation (SCAC wrist): the scaphoid is extended and tends to erode into the scaphoid fossa. This maybe explained by stiffness of the STT joint preventing scaphoid rotation. The SL gap is more or less significant. On the other hand the scaphoid is rotated (flexed) and the SL gap is increased (SLAC wrist). At the end stage SCAC IV there is a destruction of all carpal joints with an « established PERILUNATE DISLOCATION » pattern.

Material & Methods: Elderly population (age 60-80)

Various presentations : acute inflammatory arthritis (PSEUDOGOUT)/chronic inflammatory arthritis (PSEUDORHEUMATOID ARTHRITIS)

From the clinical point of view they have no major limitation of movement except during acute attack with pain.

The main indication is scaphoidectomy and 4CF -TWF-TWA

Results: Results are better than in postraumatic conditions in case of motion-preserving salvage procedure regard the recovery-maintain the ROM.

Conclusions: SCAC Wrist represents a four stages evolution, similar to SLAC and SNAC wrist but with often no SL gap, vertical embedding of the scaphoid in the radius and chalky incrustation of the joint frequently mistaken for post-traumatic or primary osteoarthritis and forgotten in clinical surgical practice.

A-1110 BILATERAL THUMB CARPOMETACARPAL JOINT ARTHROPLASTY USING THE TOUCH DUAL-MOBILITY PROSTHESIS

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Introduction: Thumb carpometacarpal (CMC) arthroplasty has undergone significant developments over the past decade with the introduction of more anatomical implant designs and dual-mobility systems.

For the past eight years, the Hand Surgery Unit at Clínica Santa María has followed a standardized protocol for the management of advanced thumb CMC osteoarthritis using the Touch® prosthesis (Kerimedical, Switzerland–France), being the first center in the country to adopt this technique. To date, more than 200 implants have been performed.

This study reports the outcomes of patients who underwent bilateral arthroplasty in two separate surgical stages.

Aim: To evaluate the clinical and functional outcomes of staged bilateral thumb CMC arthroplasty performed with the TOUCH dual-mobility prosthesis.

Material & Methods: Fourteen patients (28 hands) were included: 4 men and 10 women. Mean age was 63.8 years at the first surgery and 66.2 years at the second. All cases corresponded to symptomatic Eaton stage III CMC osteoarthritis, refractory to conservative treatment.

The Touch® dual-mobility prosthesis was used in all procedures. Surgeries were performed under brachial plexus anesthesia with proximal tourniquet control. The protocol included preoperative assessment and postoperative follow-up using pain scales, DASH scores, and grip/pinch dynamometry.

Results: The mean interval between procedures was 16 months. Patient satisfaction after the first surgery was excellent regarding pain relief, mobility, and performance of daily activities.

At six weeks, all patients were using only a night splint for comfort, and none required formal hand therapy.

No infections were recorded. Two cases of De Quervain's tenosynovitis occurred in the early phase of the series, both requiring surgical release.

One patient required an isolated cup upsizing at year five, performed without complications; this same patient later requested arthroplasty of the contralateral hand.

Conclusions: The use of dual-mobility prosthetic systems for the treatment of thumb CMC osteoarthritis appears to provide a more physiological biomechanics and satisfactory functional outcomes. The consistent results and absence of increased complications in staged bilateral procedures suggest that this technique is predictable, clinically reliable, and a suitable option for patients with advanced bilateral disease.

A-1111 FUNCTIONAL OUTCOME OF DISTAL NERVE TRANSFERS FOR HIGH MULTIPLE PERIPHERAL NERVE INJURIES IN UPPER LIMB

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Introduction: Primary repair of a high peripheral nerve injury results in a uniformly poor outcome as a result of the great distance between the site of injury and the innervated muscles. Distal nerve transfers are one of many options available to the hand surgeons caring for these patients, those are further squeezed in case of mixed nerve injuries.

Aim: To evaluate functional outcome of distal nerve transfers in mixed peripheral nerve injuries at high level in addition to primary repair.

Material & Methods: Prospective study of 5 year conducted at HULS department, CMH Lahore from 2016 to 2021 with follow up period of 3 years. Total number of 34 patients with high mixed nerve injuries with different combinations were treated with distal nerve transfers in addition to primary neurorrhaphy.

Results: Distal nerve transfers for the treatment of high mixed nerve injuries is a much better approach than the traditional primary neurorrhaphy only that results in reduction in reinnervation period and allows quick recovery which is critical to the function of the hand.

Conclusions:

A-1113 OMEGA-3 FATTY ACIDS ENHANCE REMYELINATION AND MOLECULAR RECOVERY FOLLOWING PERIPHERAL NERVE COMPRESSION: AN EXPERIMENTAL RAMAN SPECTROSCOPY STUDY

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Background: Peripheral nerve compression (PNC) results in progressive structural and functional impairment due to sustained mechanical stress, inflammation, ischemia, and disruption of myelin lipid organization. While surgical decompression addresses the mechanical insult, adjunctive biological therapies are increasingly recognized as essential to optimize nerve regeneration and remyelination. Omega-3 fatty acids possess anti-inflammatory, neuroprotective, and membrane-stabilizing properties that may promote recovery following peripheral nerve injury.

Aim: To evaluate the effect of Omega-3 fatty acid therapy on peripheral nerve regeneration, remyelination, and functional recovery following sciatic nerve compression, and to compare its efficacy with steroid treatment using advanced molecular and ultrastructural analyses.

Materials & Methods: A controlled experimental study was conducted on mature Sprague Dawley rats subjected to standardized right sciatic nerve compression using a titanium hemostatic clip for four weeks. Following decompression, animals received local injections of Omega-3 fatty acids, dexamethasone, or no injection (control). Nerve tissues were harvested at 2, 4, and 8 weeks post-intervention. Raman spectroscopy was employed for label-free molecular analysis of lipid and protein alterations within the nerve, focusing on ratio-metric biomarkers associated with myelin membrane ordering and fatty-acid composition. Ultrastructural changes were evaluated using transmission electron microscopy, and functional recovery was assessed through behavioral analysis.

Results: Both treatment groups demonstrated improved nerve regeneration compared with controls; however, the Omega-3 group showed the most consistent and pronounced recovery. Raman spectroscopy revealed significant enhancement in myelin lipid organization and membrane stability, evidenced by increased 1520/1160 and 11444/11301 ratios and favorable modulation of fatty-acid saturation indices. Electron microscopy confirmed superior remyelination in the Omega-3 group, with thicker, more uniform myelin sheaths and improved axonal morphology. Functional assessment correlated with molecular and ultrastructural findings, demonstrating earlier and more sustained recovery in Omega-3-treated animals.

Conclusion: Omega-3 fatty acid therapy significantly enhances molecular restoration, remyelination, and functional recovery following peripheral nerve compression. These findings support Omega-3 supplementation as a promising adjunctive therapy in PNC management and highlight Raman spectroscopy as a robust translational tool for evaluating nerve regeneration strategies.

A-1114 IN-HOUSE 3D PLANNING IMPROVES DIAGNOSTIC CHARACTERIZATION OF MADELUNG DEFORMITY BEYOND CONVENTIONAL RADIOGRAPHY

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Introduction: Madelung deformity is a growth-related disorder of the distal radius characterized by complex deformity involving the coronal, sagittal and axial planes, often associated with distal radioulnar joint (DRUJ) malalignment and altered carpal mechanics. Diagnosis and assessment of deformity severity traditionally rely on two-dimensional (2D) radiographic parameters. However, these measurements are highly sensitive to projection and wrist positioning and may not accurately reflect true three-dimensional (3D) morphology, particularly in mild, focal or atypical deformities. This can result in underdiagnosis or inconsistent interpretation of deformity severity.

Aim: To evaluate the diagnostic contribution of quantitative 3D CT-based analysis within an in-house 3D planning workflow for the assessment of Madelung deformity and to compare 3D morphological evaluation with conventional 2D radiographic assessment, both pre-operatively and in terms of outcomes.

Material & Methods: Two patients presenting with symptomatic Madelung deformity were evaluated using standard radiographs and 3D CT-based analysis. Preoperative CT scans were segmented to generate 3D models of the radius, ulna and carpus and 3D-printed patient-specific cutting guides (PSSG) were designed and produced. Case 1 has a severe Madelung deformity and case 2 a mild and atypical Madelung deformity.

Conventional 2D radiographic parameters, including ulnar tilt, volar tilt and indices of carpal translation, were measured. In parallel, a reproducible 3D measurement framework was applied to quantify multiplanar angular deformity, DRUJ alignment and distal radius surface morphology. Surface-based analysis included assessment of lunate and scaphoid fossae concavity by a least-squares fitting procedure to fit a sphere in its surface area. Pre- and postoperative assessments were performed using identical 3D protocols. Clinical evaluation included pain, range of motion and functional scores (DASH and Mayo Wrist). Analysis was descriptive.

Results: Three-dimensional analysis revealed relevant discrepancies compared with conventional radiographic assessment in both patients.

In the severe deformity, 2D radiographic parameters overestimated coronal deformity and underestimated sagittal deformity. While 2D measurements suggested only partial improvement (35°), 3D ulnar tilt showed a coherent correction from 40° preoperatively to 26° postoperatively. In contrast, 3D analysis provided coherent multiplanar measurements. In the mild deformity, radiographs suggested normal or borderline morphology, while 3D analysis demonstrated focal lunate fossa dysplasia with reduced concavity (0.625cm invers radius sphere) In this case, 3D ulnar tilt improved from 26.2° to 19.4°, and palmar carpal displacement increased from 4.2 mm to around 12 mm, approaching the physiological value. Postoperatively, 2D measurements showed variability and implausible values, whereas 3D metrics remained reproducible and showed small but anatomically plausible lunate subsidence values -(approximately 0.8 mm preoperatively and 1.6 mm postoperatively in the mild case). Clinically, both patients improved in pain, motion and functional scores.

Conclusions: Quantitative 3D CT-based analysis within an in-house planning workflow provides a more reliable characterization of Madelung deformity than conventional radiographic assessment, particularly in mild or atypical presentations.

A-1115 LOCKING PLATE FIXATION FOR VERY DISTAL DISTAL RADIUS FRACTURES: IS THERE A ROLE FOR ALTERNATIVES TO ACUTE INTERNAL FIXATION?

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Introduction: Very distal distal radius fractures present unique challenges due to limited bone stock available for fixation and the proximity to the radiocarpal joint. Volar plate osteosynthesis has become a widely adopted technique, yet evidence regarding its effectiveness in very distal fracture patterns remains limited.

Aim: To evaluate the effectiveness and reliability of volar plate osteosynthesis for very distal distal radius fractures by analyzing radiographic alignment, complication rates, need for revision surgery, and functional recovery.

Material & Methods: This retrospective study reviewed patients treated surgically with volar locking plate fixation for very distal distal radius fractures at the CTO Hospital of Turin between 2020 and 2025. Clinical records, radiographic data, intraoperative findings, and postoperative outcomes were analyzed. Primary outcomes included radiographic alignment, complication rates, and the need for revision surgery. Secondary outcomes included functional recovery and patient-reported measures when available.

Results: The cohort demonstrated a high rate of radiographic restoration and maintenance of reduction throughout follow-up. Complications were infrequent and predominantly related to hardware prominence. Very few cases required secondary procedures such as radioscapulohumate arthodesis. Functional outcomes were generally favorable, with most patients regaining satisfactory wrist mobility and returning to daily activities within expected timelines.

Conclusion: Volar plate osteosynthesis appears to be a reliable and effective treatment for very distal distal radius fractures, providing stable fixation and low complication rates even in challenging fracture configurations. These findings support the use of volar plating as a preferred surgical option in this subset of injuries.

A-1116 OUR EXPERIENCE OF ARTHROSCOPIC MANAGEMENT OF ERB'S PALSY: A NOVEL TECHNIQUE IN LATE PRESENTATION

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Introduction: Erb's palsy is the most common brachial plexus birth palsy due to C5,C6 nerve roots. Most injuries are partial (Neuropraxia or axonotmesis) mostly due to traction as with Sholder dystocia during labor. With Erb's palsy (C5-6), the arm is adducted and internally rotated at the shoulder and extended at the elbow, due to weakness in the deltoid, supero-posterior rotator cuff and biceps. This typical posture results in contracture formation that begins as early as 2-3 weeks after birth, with the glenohumeral joint most commonly affected. Lack of early physiotherapy matures this contracture that involves the subscapularis muscle along with anterior capsule of the shoulder joint. In late cases even with recovery of nerve injuries, the deformity persists because of this contracture. So, to regain the functionality this contracture needs to be released that generally done by open subscapularis release or rotational osteotomy of humerus showing poor outcome due to non-compliance to physiotherapy being the painful procedures. To overcome this issue, arthroscopic release of the contracture has been performed by different surgeons that in fact is less painful day care procedure and encourages early physiotherapy.

Aim: To share our experience of arthroscopic release of shoulder contracture in late cases of Erb's palsy resulting early compliance to mobility and good functional outcome.

Material & Methods: we managed 43 cases in last 4 years, in HESS (Hand, Elbow, shoulder Solutions) center, Farooq Hospital and HULS (Hand and Upper limb surgery) Center, Combined Military Hospital, Lahore, Pakistan. 18 were male and 23 were female children. Mean age was 4 years. All were managed arthroscopically after complete assessment. All of them were lacking abduction and external rotation due to anterior shoulder contracture formation. All surgeries were performed by single surgeon.

Results: Among 43 children, 28 acquired quite reasonable mobility only with arthroscopic release while other 15 patients required Latissimus Dorsi transfer in later stage that generally we do after 6 months of release of contracture. Mean acquired abduction was up to 120 degree and external rotation was 45 degrees. Right upper extremity was most commonly involved. All started with early mobility and good compliance to physiotherapy.

Conclusions: Early diagnosis of birth palsy is the main hallmark in the management. In late cases arthroscopic release of anterior shoulder contracture is a minimal invasive way of treatment resulting in immediate mobilization with superb compliance leading an excellent outcome in Erb's Palsy.

A-1117 OBJECTIVE 3D ASSESSMENT OF HAND FUNCTION: A FEASIBLE MODEL FOR CLINICAL USE IN UPPER LIMB SPASTICITY

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Introduction: Accurate assessment of hand function is crucial in patients with upper limb spasticity. Although 3D motion analysis is increasingly applied to the upper extremity, existing hand models are difficult to use clinically due to missing segments, limited degrees of freedom, and complex marker placement. Reliable evaluation of thumb motion and the metacarpal arch remains particularly challenging. This study presents a clinically feasible 3D marker-based hand model that enables simultaneous assessment of wrist, finger, thumb, and forearm pro-/supination kinematics.

Aim: To develop and implement a novel marker-based 3D hand model optimized for clinical use, and to evaluate its interrater and intersession reliability in healthy adults as well as its applicability in patients with upper limb spasticity.

Material & Methods: Twenty healthy adults (31.2 ± 11.2 years; 10 male, 10 female) underwent bilateral hand assessment using a 14-camera motion capture system (Qualisys; 100 Hz). Upper-limb kinematics were recorded with the U.L.E.M.A. model, supplemented by 24 hand markers placed according to the Metcalf model. Marker placement and data collection were performed twice by two independent raters to assess interrater reliability; test–retest reliability was evaluated in a repeated session after seven days. Participants completed standardized maximal active range-of-motion tasks including forearm pronation–supination, wrist flexion–extension (with extended fingers and closed fist), full finger flexion–extension, thumb–little–finger opposition, and thumb IP flexion–extension. Joint angles were computed using custom Python routines based on ISB recommendations, including calculation of MCP, PIP, DIP, metacarpal arch, and thumb CMC movements (opposition, abduction/adduction, anteposition). Reliability was quantified using ICC(2,k) and SEM values. Clinical feasibility was examined in five patients with upper limb spasticity ($MAS \leq 2$; Tardieu ≤ 1) due to cerebral palsy, traumatic brain injury, or intracerebral hemorrhage.

Results: Interrater reliability was good to excellent for most wrist and thumb joint angles ($ICC > 0.77$), and moderate to good for MCP joints 2–5 ($ICC > 0.62$). Distal finger joints (DIP4, DIP5, PIP2) and the second metacarpal arch demonstrated lower agreement. SEM values ranged from 1.6° to 9.1° (mean $4.4^\circ \pm 1.7^\circ$). Intersession reliability showed a similar pattern, with good reproducibility across most joints (mean SEM $4.4^\circ \pm 1.6^\circ$), but reduced reliability in DIP4, PIP5, MCP2

extension, and the second metacarpal arch. Thumb kinematics—including opposition, abduction, anteposition, and IP flexion—showed moderate to excellent reliability. All measurements were feasible in patients with spasticity, with no marker loss and successful completion of all ROM tasks.

Conclusions: The proposed 3D hand model provides a comprehensive and clinically feasible approach for assessing wrist, finger, and thumb kinematics, including the metacarpal arch and forearm pro-/supination. Reliability was good to excellent for most functional joint motions, comparable to previously reported one-marker-per-segment approaches, while maintaining patient comfort and clinical applicability. Although small distal finger joints remain challenging, the model enables objective and reproducible assessment of hand motion and is suitable for clinical evaluation of patients with upper limb spasticity.

A-1118 TREATMENT OF PROXIMAL POLE SCAPHOID NONUNION WITH ARTHROSCOPY. CLINICAL AND RADIOLOGICAL RESULTS OF 15 CASES

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Introduction: Nonunion and delayed union of the proximal pole is one of the most common and challenging complications of scaphoid fractures. Considering the vascular anatomy and the retrograde blood flow to the proximal pole, the treatment of choice, historically, was the use of vascularized bone graft through an open approach. However, current literature supports the use of arthroscopy and non-vascularized bone graft as minimally invasive technique that causes minimal damage to the soft tissues and yields excellent results.

Aim: The aim of the present study was to retrospectively assess the clinical and radiological outcomes of patients that underwent treatment for proximal scaphoid pole nonunion with arthroscopy and non-vascularized grafting

Material & Methods: This was a retrospective study. The data of patients with proximal pole scaphoid nonunion that underwent arthroscopically-assisted fixation with autologous grafting from 2020 to 2025 at our center were collected and analyzed. The sample size consisted of 15 patients (14 males – 1 female). The mean age of the patients was 27 years of age (range=18–44). Diagnosis was made with x-ray and computed tomography (CT) imaging and proximal pole nonunion were defined at or proximal to the junction of the proximal and middle thirds of the scaphoid (Schernberg classification I and II). In 10 patients the fracture was located at the junction of middle and proximal third (Schernberg II) and at 5 patients was at the proximal sixth (Schernberg II). Autologous graft from ipsilateral radial metaphysis was used in all cases. The average time from injury to surgery was 8.5 months (range=3–16). Surgery was performed under mini c-arm fluoroscopy. Reduction was achieved with closed techniques and compression screw or k-wires were used for osteosynthesis. The minimum follow-up was set to 6 months, with monthly radiological and clinical evaluation. The parameters that were included in the study were the time to union, post-operative pain with Visual Analogue Scale (VAS) score and clinical outcome measured with Mean Disabilities of the Arm, Shoulder, and Hand (Quick DASH) and MAYO Wrist score (MWS).

Results: Demographic data showed that at 29.4% of the patients the dominant hand was involved, at 41.18% the right extremity and that 52.94% of the patients were high demand manual workers. The mean follow-up was 12.9 ± 6.8 months (range=6–23). Union was achieved at 93.3% of the sample (14 of 15 patients) at a mean of 12 ± 2.6 weeks. Union was confirmed with radiologic evaluation for most patients and CT was needed for 3 patients. One case that failed to unite was an early case and was due to technical error. Functional outcome was significantly improved with mean Quick DASH decrease from 27.32 ± 9.32 pre-operatively to 4.99 ± 5.21 ($p < 0.001$) and mean MWS increase from 52.63 ± 18.3 to 87.22 ± 13.25 , $p < 0.001$. Pain was, also, significantly decreased from 4.82 ± 1.3 to 1.77 ± 1.56 , $p < 0.001$.

Conclusions: The results of the present study are in line with current literature, indicating that wrist arthroscopy is a valuable tool in the setting of scaphoid proximal pole nonunion, providing satisfactory functional outcomes with high rates of successful union.

A-1119 COMPLEX PIP JOINT FRACTURES TREATED WITH PINS AND RUBBER BAND TRACTION: A RETROSPECTIVE STUDY OF THE OUTCOME AFTER A PIP FRACTURE

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Introduction: Proximal interphalangeal (PIP) joint fractures often result in reduced hand function, both regarding strength and range of motion. Several methods exist to treat these PIP joint fractures, both surgical and non-surgical. Despite this the outcomes can be discouraging. The pin and rubber traction system, first described by Suzuki, may offer a reliable outcome for PIP fractures.

Aim: This study aims to further investigate the outcome of the PRTS in relation to function and pain, by comparing the outcome and complications in intraarticular PIP joint fractures that have been treated with this system.

Material & Methods: 37 individuals were treated with the PRTS during the years 2014–23. 11/34 patients came in for a clinical examination. 24/34 persons did a phone interview, we were unable to contact 10/34. Additionally we administered q-DASH, CISS and EQ-5D questionnaires **Results:** Our results indicate that participants had little to no pain more than a one year after the PRTS treatment, reflected both in the phone interview's median verbal self-rating, satisfaction rating was 7 (IQR 5–9). The median pain rating at rest and during activity, were 1 (IQR 1–1) and 1 (IQR 1–2), respectively. ROM was reduced in both the PIP and DIP joint of the injured vs non-injured hand.

The median loss of ROM was 30° (IQR 15–60°) in the PIP joint and 60° (IQR 15–75°) in the DIP joint. The quickDASH score was a median of 14 (IQR 5–34)

Conclusions: Despite a decreased aROM and raised quickDASH score the participants have high satisfaction ratings measured and low pain rating. Cold sensitivity and general perception of low health have worse outcome.

A-1120 BEST BALANCING OPTIONS AFTER TRAUMATIC BRACHIAL PLEXUS INJURY IN PATIENTS >50 YEARS

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Introduction: Brachial plexus injuries (BPI) are associated with severe disruption of the balance of the affected limb, in terms of motor and sensory function, despite a variety of available treatment strategies. The incidence of these injuries is increasing among older adults, likely reflecting a more active aging population; however, the underlying biology often remains unforgiving.

Aim: This study aimed to evaluate which treatment options are most appropriate for patients aged >50 years who sustained a traumatic BPI.

Material & Methods: In this retrospective analysis we evaluated patient data extracted from the electronic clinical records. We included consecutive patients with a traumatic BPI, aged >50 years, that were treated at our institution either operatively or conservatively. All cases exist in the period from September 2007 to April 2024. Patients with BPI

other than trauma and < 50 years were excluded. Treatment modalities, injury characteristics, operative interventions, and clinical outcomes were reviewed.

Results: The study included 11 patients, 10 of whom were male, with a median age at time of injury of 63 years (range 52-76 years). In 9 cases the BPI was due to polytrauma. This included 3 motorbike accidents, 2 ski injuries, 1 bike accident, 2 car accident and 1 non specified polytrauma. The remaining 2 cases were isolated traumatic BPI due to either fall or bike injury. C5-C6 segments were involved in 7 cases, 3 of which also affecting C7, 1 patient had distal BPI (C7-Th1), 3 patients demonstrated a complete BPI. The right side was affected in 54% cases. Operative treatment was performed in 10 cases, median time from injury to first surgery 30.7 weeks (range 17-42.4). Of the 10 cases, 7 nerve transfers, 2 nerve reconstructions and one neurolysis were performed. Eight of these patients underwent a second operation with a muscle transfer in 5 cases, nerve transfer in one case, neurolysis in another case and implantation of a neuromodulatory pain electrode in one case. Two patients underwent a third surgery - 1 tendon transfer and 1 implantation of pain electrode. Persistent pain at final follow-up was reported by 45% patients (n=5). Two patients benefited from the chosen surgical treatment with improved motor function and strength and absence of pain at last follow up. Nevertheless, 72% patients were satisfied and perform daily life activities with aids and trick movements to overcome the BPI consequences.

Conclusions: Traumatic BPI in the elderly population represents a complex clinical challenge and surgical interventions may offer limited benefit to restore the balance among these patients. Nevertheless, treatment decisions should be individualized, taking into account patient-specific goals, functional demands and overall health rather age alone.

A-1121 TESTING RELIABILITY OF 4DCT-DERIVED WRIST KINEMATICS IN HEALTHY AND SCAPHOLUNATE-INJURED WRISTS

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Introduction: Four-dimensional CT (4DCT) wrist imaging is increasingly being used to assess wrist instability by quantifying wrist kinematics in non-invasively. Allowing participants to perform free wrist motion while the forearm is fixated in a holder enables standardized movements during acquisition. However, allowing for free wrist motion may introduce variability in the acquired motion patterns, particularly in the presence of scapholunate instability. To ensure that this imaging approach is suitable for reproducible quantitative kinematic assessment, the scan procedure must result in sufficient test-retest consistency in the derived kinematic parameters.

Aim: The aim of this study was to evaluate the test-retest reliability of 4DCT-based wrist kinematics in healthy wrists and in wrists with suspected scapholunate (SL) injury.

Material & Methods: In this prospective study, patients with a unilateral clinical indication of SL injury were recruited. After informed consent, each participant underwent a bilateral 4DCT scan, with the contralateral wrist serving as a healthy control. The scan protocol consisted of one static image and subsequently two dynamic imaging sequences, while the patients moved their wrists in radial-ulnar deviation (RUD) and flexion-extension (FE). To test for reliability, the two dynamic imaging sequences were repeated. The wrist motions were performed freely with both forearms fixated using a custom-made wrist holder. An automated algorithm segmented and registered all bones at each time point. The following kinematic parameters of the scaphoid and lunate were assessed: the 3D scapholunate distance (SLD), 3D translation (norm of x, y, z), and 3D rotation (axis-angle magnitude). Reliability was quantified using the coefficient of

multiple correlation (CMC) and root mean square difference (RMSD). Finally, a paired t-test assessed whether reliability differed between movement directions.

Results: Dynamic CT scans of both wrists of eighteen patients were included. For RUD, reliability analysis showed a CMC value of 0.84 for SLD and CMC values higher than 0.92 for scaphoid and lunate translation and rotation. RMSD values were low, with 0.13 ± 0.10 mm (mean $\pm$ standard deviation) for SLD, 0.65 ± 0.66 mm for translations, $3.6 \pm 2.6^\circ$ for scaphoid rotation, and $2.9 \pm 2.2^\circ$ for lunate rotation. For FE, similar reliability was observed, with CMC values of 0.83 for SLD and 0.97 for both scaphoid and lunate translation and rotation. RMSD values ranged from 0.16 ± 0.18 mm for SLD, 0.74 ± 0.60 mm for translations, and $4.5 \pm 2.9^\circ$ for rotations. For both movements, no significant differences were found between directions for any kinematic parameter.

Conclusions: This high test–retest reliability of scaphoid and lunate kinematics demonstrates that 4DCT can accurately quantify the motion of the two key bones involved in scapholunate instability. Across both FE and RUD, rotational and translational parameters demonstrated highly consistent motion patterns across repeated acquisitions. No significant direction-dependent differences were observed, highlighting that the method is robust across the full range of wrist motion. Finally, reliable measurements were achieved when participants performed the motion freely with only a wrist holder, indicating that movements need not to be guided in a sophisticated setup to obtain reproducible dynamic wrist imaging.

A-1122 THE FOREARM ITALIAN PERFORMANCE SCORE (FIPS): DEVELOPMENT AND STATISTICAL VALIDATION

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Introduction: The forearm is a complex functional unit composed of three stabilising osseoligamentous systems—the proximal, middle, and distal radioulnar joints—whose integrated function is essential for upper limb mechanics. Despite the clinical relevance of unstable lesions of the forearm (ULF), a validated assessment tool specifically designed for this anatomical region has long been lacking. To address this gap, the Forearm Italian Performance Score (FIPS) was developed by elbow and hand surgeons as a simple, clinically applicable tool integrating pain, movement, stability, strength, radiological findings, and work-related functional status. While face validity had already been established during an international consensus meeting, no prior study had evaluated its psychometric properties. This study aims to assess the concurrent validity, reliability, internal consistency, and responsiveness of FIPS.

Aims: The primary aim was to evaluate the convergent validity of FIPS against established upper-limb outcome measures (MEPI, MWPS, QuickDASH). Secondary aims were to determine the inter- and intra-observer reliability, internal consistency, and responsiveness of the scale in patients surgically treated for forearm malalignment.

Materials and Methods: A prospective multicentre observational cohort study was conducted across three orthopaedic units (Bologna, Faenza, Torino) including 100 consecutive adult patients surgically treated for acute fracture-dislocations of the radius and/or ulna resulting in forearm malalignment. Exclusion criteria included pathological fractures and conditions pre-existing forearm dysfunction. Patients were evaluated at 7 days and 3 months post-surgery. Instruments administered included FIPS, MEPI, MWPS, and QuickDASH. Reliability was evaluated using Intraclass Correlation Coefficients (ICC) in a subgroup assessed twice by the same and then by a second blind observer. Internal consistency was measured using Cronbach's α . Responsiveness was assessed via Wilcoxon tests and effect sizes.

Results: The cohort had a mean age of 48.7 years and included 54 females and 46 males. FIPS total score improved significantly from a mean of 61.8 at 7 days to 91.05 at 3 months, with a large effect size of 1.46, demonstrating high

responsiveness. The domains of pain, movement, strength, and return to work showed large effect sizes (>0.8), whereas stability and radiological assessment changed minimally. Convergent validity was moderate, with correlations of FIPS total score with MEPI ($p=0.58$), MWPS ($p=0.40$), and QuickDASH ($p=-0.47$). Intra-observer reliability was excellent ($ICC=0.99$), and inter-observer reliability reached $ICC=1$. Internal consistency was questionable ($\alpha=0.66$), improving slightly when radiological findings were excluded ($\alpha=0.689$). By 3 months, 53% of previously work-restricted patients returned to unrestricted work.

Conclusions: The FIPS is the first validated forearm-specific scoring system and demonstrates high reliability, adequate validity, and strong responsiveness for monitoring recovery after unstable forearm lesions. Its simplicity, low cost, and applicability across multiple clinical professions make it suitable for routine use in surgical and rehabilitative settings.

A-1123 FRACTURE–DISLOCATIONS OF THE FOREARM JOINT: A SYSTEMATIC REVIEW OF THE LITERATURE AND A COMPREHENSIVE LOCKER-BASED CLASSIFICATION SYSTEM

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Introduction: Fracture–dislocations of the forearm encompass a wide and heterogeneous group of injuries traditionally described using eponymous terms such as Monteggia, Galeazzi, and Essex-Lopresti. These labels, however, are inconsistently applied and often fail to accurately describe rare, mixed, or atypical presentations. Improved understanding of forearm biomechanics introduced the concept of the forearm joint, comprising the proximal radioulnar joint (PRUJ), distal radioulnar joint (DRUJ), and the interosseous membrane functioning as the middle radioulnar joint (MRUJ). Together, these structures form a three-locker system essential for rotational and longitudinal stability. Reassessing fracture–dislocations within this functional framework may enhance diagnostic precision and treatment planning.

Aim: To systematically review the literature describing forearm fracture–dislocations and organize all reported patterns into a comprehensive classification system based on the involvement of the three forearm lockers.

Materials & Methods: A systematic search of PubMed (1998–2018) identified clinical studies, trials, and case reports reporting fracture–dislocations of the forearm, including classical eponymous injuries and atypical variants. Articles in English, Italian, French, and German were included. Of 884 records screened, 462 remained after duplicate removal; 44 full-text studies describing atypical patterns met the inclusion criteria. Three additional historical reviews of classical injury types were also analyzed. Each injury pattern was categorized using an alphanumeric algorithm identifying PRUJ involvement (1), MRUJ/interosseous membrane disruption (2) with optional modifiers (2I: IOM rupture; 2R: radial fracture; 2U: ulnar fracture), and DRUJ involvement (3).

Results: The review identified all but one of the 13 theoretically possible two- or three-locker combinations. Classical injuries corresponded clearly to specific locker patterns: Monteggia (1.2IU), Galeazzi (2IR.3), and Essex-Lopresti (1.2I.3). Numerous additional configurations—previously termed variants or equivalents—were clarified within the locker-based system. These included isolated PRUJ or DRUJ dislocations, crisscross injuries (simultaneous PRUJ and DRUJ dislocation with intact MRUJ), and combined shaft fractures associated with proximal and/or distal radioulnar joint instability. Several rare three-locker injuries beyond the Essex-Lopresti pattern were identified, characterized by combined PRUJ and DRUJ dislocation with radial and/or ulnar shaft fractures producing longitudinal instability. The classification system allowed all patterns, including atypical and previously misclassified injuries, to be described consistently and anatomically.

Conclusion: This systematic review demonstrates that forearm fracture–dislocations can be consistently and

comprehensively categorized using a three-locker–based alphanumeric classification. Unlike traditional eponyms, this system accurately captures classical, atypical, and rare injury patterns, offering a unified and biomechanically grounded nomenclature. Its adoption may improve diagnostic clarity, facilitate recognition of injury complexity, and better guide surgical decision-making.

A-1124 THE EFFECTS OF SENSORY INTEGRATION THERAPY ON MOTOR, COGNITIVE, AND LANGUAGE DEVELOPMENT IN CHILDREN WITH OBSTETRIC BRACHIAL PLEXUS INJURY: A PILOT SINGLE-BLIND STUDY

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Introduction: Obstetric brachial plexus injury (OBPI) restricts upper extremity movements and may lead to delays in motor planning, cognitive development, and language skills during early childhood. Conventional rehabilitation approaches predominantly target motor components, and studies examining interventions that simultaneously address multiple developmental domains remain limited. Variations in families access to therapy and routine treatment pathways highlight the need for pilot studies that reflect real-life clinical conditions and examine the feasibility and potential effects of multi-domain developmental interventions.

Aim: This pilot study aimed to investigate the potential effects of a sensory integration-based intervention on motor, cognitive, and language development in children with OBPI.

Material & Methods: A total of 18 children diagnosed with OBPI were included in this pilot study. Participants were assigned to an intervention group ($n = 9$) and a control group ($n = 9$). Children were between 7 and 35 months of age. Inclusion criteria were a confirmed diagnosis of OBPI and completion of both pre- and post-intervention assessments. Children with additional neurological, genetic, or orthopedic conditions that could affect developmental outcomes were excluded. The intervention group received individual sensory integration–based therapy twice per week for eight weeks, with each session lasting approximately 45 minutes, while the control group continued their routine clinical follow-up without additional occupational therapy. Developmental outcomes were assessed using the Bayley III scales, administered before and after the intervention by an independent evaluator blinded to group allocation. Statistical analyses compared within-group and between-group changes across time.

Results: Baseline characteristics—including age, gestational age, birth weight, neonatal intensive care unit (NICU) history, sex, and affected side—did not differ significantly between groups ($p > .05$). Bayley III pre-test scores were also comparable across groups. After eight weeks, cognitive composite scores demonstrated a significant time-by-group interaction, indicating greater improvement in the intervention group compared with controls ($p < .001$). Time-by-group interactions for language ($p = .366$), motor-right ($p = .262$), and motor-left ($p = .312$) domains were not statistically significant, although both groups showed developmental progress over time. Categorical analyses revealed upward transitions toward higher performance levels in motor and language domains in the intervention group, although these changes were not statistically significant.

Conclusions: Overall, pilot findings suggest that the sensory integration-based intervention produced a meaningful improvement particularly in the cognitive domain, with positive developmental trends observed in motor and language areas.

A-1125 MICROLINK-ASSISTED MINIMAL-TUNNEL 360° SCAPHOLUNATE RECONSTRUCTION: A MOTION-PRESERVING APPROACH TO REDUCE TUNNEL-DRILLING MORBIDITY

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Introduction: Scapholunate (SL) ligament injuries disrupt coordinated carpal kinematics and may progress to SL advanced collapse (SLAC). Conventional reconstructions, including tendon-graft ligamentoplasties, and 360° procedures, often require sizable bone tunnels or multiple transosseous passes that increase morbidity, risk iatrogenic injury, and may contribute to postoperative stiffness or bone degeneration. Although internal-brace systems provide immediate stability, most current techniques still depend on substantial drilling or hardware. A reconstruction method that restores SL balance while minimizing tunnel-related morbidity could help preserve motion and reduce complications.

Aim: To report preliminary clinical and radiographic outcomes of a minimal-tunnel open 360° SL reconstruction technique using the Microlink internal brace system, designed to avoid the morbidities associated with conventional tunnel-drilling while supporting recovery of functional wrist motion.

Materials and Methods: Ten consecutive patients (6 male, 4 female) with arthroscopically confirmed Geissler grade 3–4 isolated SL injuries were treated between September 2023 and November 2024. Seven were right-hand dominant, and eight injuries involved the dominant wrist. SLAC or associated ligamentous injuries were excluded. All patients had at least 12 months of follow-up. After diagnostic arthroscopy, SL reduction and stabilization were performed through an open approach. Only the Microlink guide-wire was used to create the transosseous passage, avoiding additional drilling, reaming, or interference screws. The construct provided circumferential stabilization aimed at restoring dorsal and volar restraint. Immobilization lasted one week, followed by early controlled motion and a proprioceptive and dart-throwing rehabilitation protocol starting at six weeks. Outcome measures included VAS pain, modified Mayo Wrist Score, QuickDASH or PRWE, grip strength, range of motion (ROM), and radiographic SL gap and angle. Postoperative evaluation was performed by an independent surgeon.

Results: All patients demonstrated clinically relevant improvement. Average pain with activity decreased from 6–7 to 1–2, and at rest from 3–4 to 0–1. Mayo Wrist Score improved from approximately 60 preoperatively to approximately 85 at final follow-up. QuickDASH or PRWE improved from 40–50 to 10–20. Flexion increased by 30–35%, extension by approximately 20%, and the flexion–extension arc by approximately 20–25%, reaching 80–85% of the contralateral wrist. Grip strength improved from 60–70% to 85–90% of the opposite side. Radiographs showed maintained SL gap and angle correction, with no recurrent instability or degenerative progression. No further tunnel opening was seen in postoperative tomographies. No complications or reoperations were recorded. These improvements in pain, function, and motion are consistent with outcomes reported for non-biological scapholunate reconstructions at comparable follow-up intervals.

Conclusions: Microlink-assisted minimal-tunnel 360° SL reconstruction appears to restore scapholunate balance and support recovery of wrist motion while reducing the morbidity associated with traditional tunnel-drilling techniques. By limiting osseous disruption to a guide-wire–sized passage and avoiding tendon grafts or interference screws, the technique preserves carpal integrity and facilitates early rehabilitation. Early results suggest a motion-preserving alternative for isolated SL injuries, comparable to contemporary non-biological reconstructions. Further studies with larger cohorts and longer follow-up are warranted to determine long-term results.

A-1126 LONG-TERM EFFICACY OF ARTHROSCOPIC SCAPHOLUNATE LIGAMENT SHRINKAGE IN RESTORING CARPAL STABILITY: A LARGE CASE SERIES WITH EXTENDED FOLLOW-UP

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Introduction: Normal wrist function depends on a finely regulated interplay between ligamentous integrity, intercarpal alignment, and coordinated load transmission. Scapholunate ligament (SLL) instability represents the most frequent disruption of this equilibrium, compromising both the mechanical stability of the wrist and its normal function. Even partial tears or stretching of the ligament can destabilise the scapholunate complex, leading to functional compromise. Arthroscopic SLL shrinkage has been proposed as a minimally invasive means of restoring this delicate balance. However, evidence on its long-term efficacy and durability remains limited. Existing studies are constrained by small cohorts and follow-up periods rarely exceeding five years, leaving unanswered whether this technique can reliably maintain carpal stability over time.

Aim: To evaluate long-term outcomes of arthroscopic SLL shrinkage in a large consecutive cohort, with specific focus on sustained restoration of carpal stability, functional performance, reoperation rates, and complications.

Material & Methods: A retrospective review was performed of all patients undergoing arthroscopic SLL shrinkage at our centre between 2005 and 2018. Functional outcomes were assessed using the Quick Disabilities of the Arm, Shoulder and Hand (qDASH) score and the Mayo Wrist Score (MWS) via structured telephone follow-up. Reoperation rates, complications, and arthroscopic findings were recorded to characterise the severity of instability and evaluate durability of correction. **Results:** Ninety-two patients (93 wrists; mean age 38.3 years; 55 female, 38 male) were included.

At a mean follow-up of 74.3 months (range 12 - 170) 95% of patients (n=87) required no further surgery. 3% (n=3) underwent open scapholunate stabilisation, while two underwent repeat arthroscopy for separate pathology- both demonstrating preserved joint stability.

Functional outcomes were obtained from 33 patients at a mean of 72.3 months post-surgery. Results demonstrated excellent long-term functional balance and high patient satisfaction: mean qDASH 4.55, mean MWS 85, with 87.9% satisfied and 78.8% fully satisfied. Complications were minimal, limited to cold intolerance in five cases and mild symptom recurrence in three.

We present extended follow-up at a mean of 153 months (range 87–250), confirming the long term durability of this procedure.

Conclusions: Arthroscopic SLL shrinkage offers a durable, minimally invasive solution for restoring and maintaining carpal stability in patients with symptomatic SLL instability. This large case series - with the longest follow-up currently available - demonstrates excellent functional results, high patient satisfaction, and very low reoperation and complication rates.

A-1127 CATASTROPHIC OUTCOME AFTER BRACHIO-METACARPAL CAST IMMOBILIZATION FOR A WRIST FRACTURE: TRANSHUMERAL AMPUTATION, CLINICAL COURSE, AND MEDICO-LEGAL CONSIDERATIONS

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Introduction: Compartment syndrome is a rare but severe complication of upper-limb fractures, especially when managed with cast immobilization. Missed or delayed diagnosis can lead to irreversible soft-tissue and neurovascular damage, potentially resulting in complex regional pain syndrome (CRPS), chronic disability, and major medico-legal implications. We report a case of a distal radius fracture treated conservatively, in which early ischemic signs were not addressed, ultimately progressing to multiple amputations.

Aim: The aim of this case report is to outline the clinical evolution of an unrecognized compartment syndrome following cast treatment of a distal radius fracture and to highlight the consequent functional, pain-related, and medico-legal burden. **Material and Methods:** A 50-year-old patient sustained a distal radius fracture managed with a brachio-metacarpal cast. In the first days after immobilization, she reported severe pain (NRS 8), marked swelling, and violaceous discoloration of the hand. Clinical reassessments were performed at 3, 14, and 30 days without modification of the treatment strategy. At cast removal, ischemic signs persisted. Over the following two years, she underwent multiple specialist evaluations, culminating in a diagnosis of refractory CRPS type I.

Results: Four years after the initial trauma, progressive deterioration led to a trans-radiocarpal amputation, followed by a trans-humeral amputation with RPNI implantation. Two central neuromodulation systems were implanted without clinical benefit. The patient currently presents chronic neuropathic pain, phantom limb syndrome, and is not eligible for prosthetic fitting due to symptom severity and functional impairment.

A formal medico-legal assessment was conducted to quantify the permanent impairment, establishing an 80% disability rating and confirming the substantial impact of the delayed diagnosis on the patient's outcome.

Conclusions: This case emphasizes the need for timely recognition and prompt management of compartment syndrome in patients treated with cast immobilization for distal radius fractures. Early identification of disproportionate pain, progressive swelling, and color changes may prevent catastrophic complications such as limb loss, refractory CRPS, chronic neuropathic pain, and major disability. From both a clinical and medico-legal perspective, strict monitoring and rapid intervention are essential to optimize patient safety and functional recovery.

A-1128 TWENTY YEARS OF EXPERIENCE WITH PROXIMAL ROW CARPECTOMY AND RCPI: A MULTICENTER RETROSPECTIVE EVALUATION OF OUTCOMES AND COMPLICATIONS

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Introduction: Proximal row carpectomy (PRC) combined with implantation of a Resurfacing Capitate Pyrocarbon Implant (RCPI) has become an increasingly adopted motion-preserving surgical option for degenerative and post-traumatic

wrist conditions, including SLAC and SNAC wrist, advanced chondral lesions, and selected complex carpal collapse patterns. While PRC alone has demonstrated reliable long-term outcomes, the addition of RCPI is intended to address capitolunate incongruence and reduce complications related to proximal migration of the capitate. Despite the growing use of this technique, high-quality long-period retrospective analyses remain limited, particularly those evaluating implant survivorship, complications, and functional recovery across different high-volume hand surgery centers.

Aims: The primary aim of this retrospective multicenter study is to assess functional outcomes following PRC combined with RCPI implantation in terms of wrist range of motion (ROM), grip strength, and patient-reported outcome measures (DASH and PRWE). Secondary aims include evaluating radiographic outcomes, identifying early and late complications, determining revision rates, analyzing implant survivorship over a 20-year period, and exploring potential predictors of suboptimal outcomes such as age, comorbidities, and variations in surgical technique.

Materials and Methods: This retrospective cohort study includes adult patients treated between January 2005 and December 2025 at the CTO Hospital of Turin and a second level-III hand surgery center of comparable expertise. Eligibility criteria include age ≥ 18 years, PRC combined with RCPI implantation, and a minimum of 12-months clinical and radiographic follow-up. Exclusion criteria include prior wrist arthrodesis or arthroplasty, significant neurologic impairment of the involved upper limb, and incomplete records. Data are extracted from hospital archives, surgical reports, standardized radiographs, and follow-up visits. Variables include demographics, comorbidities, indications for surgery, preoperative assessments, surgical technique details, implant size, postoperative care, serial clinical examinations, radiographic findings, complications, and revision surgeries. Statistical analysis will involve descriptive statistics, paired pre-/post-operative comparisons, Kaplan–Meier survivorship analysis, and multivariate regression models to identify independent predictors of clinical outcomes.

Results: The anticipated results of this study include a comprehensive characterization of long-term functional and radiographic outcomes following PRC with RCPI. It is expected that most patients will demonstrate preserved or improved ROM and grip strength compared with preoperative status, along with favorable patient-reported functional scores. Radiographic evaluation is anticipated to show stable implant positioning in most cases, with limited rates of subsidence or progressive degenerative changes. Early complications are expected to be low, while late complications may include stiffness, implant wear, and degenerative progression. Revision surgery rates are projected to be modest, with a substantial proportion of implants demonstrating long-term survivorship.

Conclusions: This study is designed to provide high-quality evidence regarding the long-term performance of PRC combined with RCPI implantation across two major hand surgery centers. The findings will help clarify the role of the RCPI in enhancing joint congruence and function, identify patient- and procedure-related risk factors for complications or failure, and support evidence-based decision-making in the management of advanced wrist pathology.

A-1129 RECONSTRUCTING CARPAL EQUILIBRIUM: LONG-TERM RESULTS OF APSI WRIST IMPLANTATION IN TWO HIGH-LEVEL ITALIAN CENTERS

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Introduction: The Adaptive Proximal Scaphoid Implant (APSI) is a pyrocarbon spacer developed to preserve wrist kinematics and maintain carpal height in conditions such as scaphoid nonunion, early SNAC wrist, and focal degenerative changes of the radioscaphoid joint. Its design aims to replicate the biomechanical role of the proximal scaphoid pole while avoiding

more invasive salvage procedures like partial wrist arthrodesis or proximal row carpectomy. Although early clinical reports have shown encouraging functional outcomes, robust long-term evidence remains limited. In particular, there is a need for high-quality retrospective analyses from specialized wrist surgery centers to evaluate implant survivorship, complication patterns, and functional performance across extended follow-up periods.

Aims: The primary objective of this 15-year retrospective, multicenter study is to evaluate clinical and functional results following APSI wrist implantation performed in two high-level hand surgery institutions. The study focuses on characterizing early and late postoperative complications, quantifying revision surgery rates and their etiologies, and identifying patient- and procedure-related factors that may predict clinical failure.

Materials and Methods: This retrospective cohort study includes adult patients who underwent APSI wrist implantation between January 2010 and December 2025 at two high-level hand surgery center with equivalent expertise. Inclusion criteria are age ≥ 18 years, APSI implantation for scaphoid-related pathology, and a minimum of 12 months of clinical and radiographic follow-up. Exclusion criteria include prior total wrist arthrodesis, advanced pancarpal arthritis at the time of surgery, neurologic deficits affecting the hand, and incomplete chart or imaging data.

Data collection encompasses demographic variables, comorbidities, preoperative clinical status, surgical indication, implant size, operative details, postoperative rehabilitation, follow-up ROM and grip strength, radiographic findings, complications, and revision procedures. Statistical analysis includes descriptive statistics, paired comparisons of pre- and postoperative measures, Kaplan–Meier survivorship curves, and multivariate regression to identify independent predictors of complications and poorer functional outcomes.

Results: The expected outcomes of this study include a detailed characterization of long-term functional performance and complications associated with APSI implantation. It is anticipated that most patients will show improvement or maintenance of wrist mobility and grip strength, with favorable patient-reported functional scores. Radiographically, the majority of implants are expected to remain stable; however, some cases may demonstrate dorsal displacement, progressive carpal collapse, or radioscaphoid degenerative changes over time. Early complications may include persistent pain or synovitis, while late complications could involve implant migration, midcarpal arthritis, or mechanical failure. Revision surgery rates are expected to be variable but modest overall.

Conclusions: This 15-year multicenter retrospective study aims to provide comprehensive evidence regarding APSI implant performance in high-volume wrist surgery settings. The findings will help refine surgical indications, identify risk factors for complications, and optimize treatment strategies for patients with scaphoid-related carpal pathology.

A-1130 THE ROLE OF THE THUMB IN THE MUSICIAN'S HAND

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Introduction: Musician's hand disorders are the subject of an increasingly abundant body of literature, which aims to study problems affecting the musculoskeletal system, the peripheral nervous system, or movement disorders. However, few studies focus specifically on the role of the thumb in musical practice and the problems associated with it.

Aim: The objective of this work was to analyze the role of the thumb in musical practice, in order to understand its specific function, as well as its role within the complex structure of the hand.

Material & Methods: A biomechanical analysis of the specific movement of the musician's hand was developed in order to then examine in depth how the role of the thumb changes in relation to the instrument played.

Results: Cases involving musicians suffering from musculoskeletal problems in the thumb will be presented.

Conclusions: The thumb plays a fundamental role in controlling the architecture of the musician's hand, and its correct functioning determines the correct activity of the rest of the hand. Motor control of the thumb differs depending on the functional role it plays, and it is essential to know how it changes when treating disorders of the musician's hand.

A-1131 EPIDEMIOLOGICAL ANALYSIS OF HAND AND WRIST TUMOURS: A 10-YEAR RETROSPECTIVE STUDY OF 685 CASES

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Introduction: The hand is a complex anatomical structure comprising of bone and soft tissue components with a highly sophisticated and specialised function. Tumours and tumour-like conditions of the hand can arise from any of these components and, thus, include both bone and soft tissue lesions. Most of those tumours are benign, however, malignant tumours do occur and have a significant implication on prognosis and function.

Since hand forms a small portion of musculoskeletal tumours i.e. 6.6% and 8.2% of bone and soft tissue tumours respectively, there are fewer epidemiological studies and the knowledge around them is still scarce.

This article aims to review the clinical characteristics and epidemiological features of hand tumours presenting to our centre.

Aim: To characterize the epidemiological profile, pathological spectrum, and age-stratified malignancy risk of hand and wrist tumours at a tertiary orthopaedic referral centre.

Material & Methods: Retrospective analysis of 759 consecutive patients with hand/wrist tumours treated at the Royal Orthopaedic Hospital (January 2013–September 2022). After exclusions (n=74), 685 pathologically confirmed cases were evaluated. Data extracted from electronic medical records and histopathology databases included: age, gender, anatomical location, and histopathological diagnosis. Descriptive statistics expressed categorical variables as percentages and continuous variables as mean $\pm$ standard deviation.

Results: The cohort (mean age 48.2 ± 18.3 years; range 2–94 years; 52.4% female) demonstrated benign predominance (92.6%, n=634). Ganglion cysts represented the most lesion overall (13.7%). Among common tumour-like lesion ganglion cysts were most prevalent (25.1%), while giant cell tumours of the tendon sheath (18.7%) and enchondromas (15.3%) predominated among benign soft tissue and osseous tumours respectively. Malignant lesions constituted 4.8% (n=33), rising significantly to 17.2% in patients >60 years. Sarcomas accounted for 61.3% of primary malignancies, with metastatic lesions being exceptionally rare (0.7% overall). Repeat biopsies (n=41) altered diagnoses in 36.6% of cases.

Conclusions: While hand and wrist tumours are overwhelmingly benign, malignancy risk escalates substantially beyond age 60. Diagnostic vigilance in elderly patients and consideration of repeat biopsy for ambiguous cases are warranted. Suspected malignancies require urgent referral to specialist centres for multidisciplinary management to prevent diagnostic delays.

A-1132 SPINAL ALIGNMENT ASSESSED WITH 4D SURFACE TOPOGRAPHY IN THORACIC OUTLET SYNDROME: PRELIMINARY RESULTS

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Introduction: Thoracic outlet syndrome (TOS) is a condition in which neurovascular structures become compressed as they pass through the cervicothoracic region. Although the anatomical sites of compression are well described, it is increasingly recognized that symptoms are influenced not only by local structural factors but also by broader postural

and myofascial interactions. Previous study has noted that TOS does not correspond to a single, uniform postural pattern; instead, individuals may present with diverse adaptations involving the cervical spine, thoracic curvature, shoulder girdle mechanics, and even lumbopelvic alignment (1). These findings support the concept that TOS represents a global neuromusculoskeletal dysfunction affecting multiple segments of the kinetic chain rather than an isolated regional disorder. This broader perspective suggests that focusing solely on local compression sites may be insufficient for understanding the condition. In clinical practice, posture is often evaluated through visual inspection, while radiographic imaging carries limitations for repeated use and may not detect subtle deviations in global alignment. For this reason, alternative approaches that allow a more comprehensive, objective, and radiation-free assessment of postural structure and spinal alignment may offer clinical value. Despite strong clinical assumptions about the relationship between posture and TOS, objective evidence remains scarce. We hypothesized that individuals with TOS would demonstrate alterations in global spinal alignment compared with healthy controls.

Aim: The aim of this preliminary study was to compare spinal alignment parameters between patients with clinically identified TOS and healthy controls using a non-radiographic 4D surface topography system.

Material & Methods: This study included individuals with diagnosed TOS and sex- and age-matched healthy controls. Posture was assessed using a non-radiographic 4D surface topography system (DIERS formetric 4D, DIERS International GmbH, Schlangenbad, Germany). All participants were scanned barefoot in a relaxed standing position.

Measured parameters included sagittal imbalance (mm/°), kyphotic angle (ICT–ITL), kyphotic apex level, flèche cervicale, flèche lombaire, pelvic obliquity (mm), pelvic torsion (°), pelvic inclination, lordotic angle (ITL–ILS), vertebral rotation RMS, and apical deviation RMS. Normality was assessed using the Shapiro–Wilk test, and group comparisons were performed using independent samples t-tests or Mann–Whitney U tests as appropriate. Statistical significance was set at $p < 0.05$. **Results:** A total of 35 individuals with TOS and 39 healthy controls were analyzed. No significant between-group differences were observed for any of the measured postural parameters (all $p > 0.05$). Overall, spinal alignment parameters did not distinguish individuals with TOS from healthy controls.

Conclusions: These preliminary findings suggest that static posture, as measured by 4D surface topography, may not be markedly altered in TOS at the population level. However, the sample size was limited, and the patient group exhibited considerable clinical variability. Larger studies, including analyses of specific clinical subgroups, are needed to determine whether certain TOS phenotypes display more distinct postural characteristics and to clarify the potential value of surface topography in the assessment of this condition.

A-1133 BASAL THUMB ARTHROPLASTY UNDER WALANT ANESTHESIA: A CASE SERIES

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Introduction: Thumb carpometacarpal (CMC) arthritis is the second most common form of hand osteoarthritis and one of the leading indications for surgical treatment. Many traditional surgical techniques shorten the first ray, potentially worsening or inducing metacarpophalangeal (MCP) joint hyperextension. In contrast, basal thumb arthroplasty with joint replacement preserves first-ray length, offering improved pinch strength recovery and reducing the risk of postoperative MCP hyperextension. The authors present a case series of trapeziometacarpal joint replacements performed between 2020 and 2025, with emphasis on patients operated under Wide Awake Local Anaesthesia No Tourniquet (WALANT).

Aim: The aim of this study was the evaluation of patient satisfaction and functional results when performing basal thumb arthroplasty under WALANT.

Material & Methods: A retrospective review of 15 consecutive thumb CMC arthroplasties performed by the same surgeon was conducted. Data collected included demographics, Eaton–Littler classification, hand dominance, pre-existing MCP hyperextension, pain scores (VAS), grip and pinch strength, and functional assessment (QuickDASH). Patients completed a satisfaction questionnaire regarding the anesthesia by telephone. Clinical and functional evaluations were performed preoperatively and at 6-month follow-up. Patients were grouped according to anesthesia technique: general anesthesia, WALANT with light sedation, and pure WALANT.

Results: The cohort consisted predominantly of women (12/13), with a mean age of 58 years. All patients presented with Eaton–Littler stage III or IV arthritis. Five cases were performed under general anesthesia, five under WALANT with light sedation, and six under pure WALANT. Two patients underwent staged bilateral procedures.

At 6 months postoperatively, average grip and pinch strength returned to or exceeded baseline values, with continued improvement noted at 1-year follow-up in patients with longer assessments. Mean VAS pain scores improved from 6.5 preoperatively to 0.7 at 6 months. The mean QuickDASH score improved from 32 to 18. Overall satisfaction was high across all anesthesia groups, with no statistically significant differences in postoperative pain, function, or satisfaction based on anesthesia type.

Three early-series patients developed De Quervain's tenosynovitis on the operated side. Elongation of the first ray may play a role as a possible cause. This complication was prevented later in the series by the routine release of the first dorsal compartment.

Conclusions: Successful basal thumb arthroplasty relies on accurate alignment, restoration of first-ray length, appropriate soft-tissue tensioning, and joint stability. WALANT provides the unique advantage of allowing real-time assessment of mobility, tension, and stability through patient's active motion during the procedure. This may contribute to optimizing implant positioning and soft-tissue balance. WALANT offers additional advantages by enabling intraoperative functional testing and providing a safe alternative for patients with increased risk associated with general anesthesia.

Thumb CMC arthroplasty provides reliable pain relief and restoration of function and strength. The type of anesthesia did not significantly influence postoperative functional outcomes in this series. De Quervain's tenosynovitis is a possible complication and routine release of the first compartment may be advisable as prevention.

A-1134 ISOLATED LUNATE RESECTION AS A MOTION-PRESERVING PROCEDURE IN A YOUNG PATIENT WITH KIENBÖCK DISEASE: A CASE REPORT AND LITERATURE REVIEW

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Introduction: Advanced Kienböck disease (KD) commonly progresses to Kienböck disease advanced collapse (KDAC), producing predictable degenerative patterns and functional limitations in young patients. Conventional salvage procedures such as four-corner fusion or proximal row carpectomy reliably relieve pain but sacrifice motion and alter wrist biomechanics. Motion-preserving options remain limited. This study reports a case of isolated lunate resection and reviews its potential role as a motion-preserving alternative in selected patients.

Aim: To describe clinical outcomes following isolated lunate resection in a young patient with advanced KD and evaluate its potential as a motion-preserving alternative to standard salvage procedures.

Material & Methods: A 26-year-old male with Lichtman stage IIIC KD underwent an open dorsal, ligament-sparing lunate resection. A minimal dorsal approach centered over the extensor pollicis longus was performed. The extensor retinaculum and dorsal capsule were incised through a proximal-based flap, exposing the radiolunate joint. The lunate

was excised with a gouge, and complete resection was confirmed fluoroscopically. No interposition material was used. Early wrist mobilization was encouraged. Wrist range of motion (ROM), grip strength, VAS pain, and QuickDASH scores were collected at 3, 6, and 12 months.

Results: Pain resolved completely at one month. By three months, the patient recovered a full flexion–extension arc of 120°. At final follow-up, grip strength reached 90% of the contralateral side, and the QuickDASH score was 4. Radiographs at 12 months showed no progression of degenerative changes or carpal collapse. The patient returned to unrestricted activity without symptoms.

Conclusions: Isolated lunate resection may be a viable motion-preserving option for carefully selected young patients with advanced KD, offering rapid pain relief and restoration of wrist mobility while potentially delaying more invasive salvage procedures. Further studies with larger samples and long-term follow-up are required to assess durability and to compare outcomes with established reconstructive strategies.

A-1135 THE PRONATOR SYNDROME: OUR EXPERIENCE ON 41 CASES

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Introduction: The term pronator syndrome (PS) describes a compressive neuropathy of the median nerve in the proximal forearm. In the most of cases, compression is between the two heads of the pronator teres muscle (PTM) or under the fibrous arch of the flexor digitorum superficialis muscle (FDS). The PS must be differentiated from the carpal tunnel syndrome (CTS), the anterior interosseous nerve syndrome, the epicondylitis, the C6 root irritation and the Lacertus Syndrome. The Magnetic Resonance (MR) and electromyography (EMG) does not always help in the diagnosis, which is mainly based on clinical history and physical examination. The dynamic ultrasound (US) can be an important diagnostic test in expert hands. The treatment of choice is surgical.

Aim: The aim of the study is to provide indications to facilitate the diagnosis of pronator syndrome and differentiate this pathology from other syndromes with which it is involved in differential diagnosis. Consequently, we would like to verify what the most appropriate type of treatment might be performed in light of the new clinical and diagnostic therapeutic acquisitions of recent years.

Material & Methods: From January 2003 to April 2024, we diagnosed 41 cases of PS in 40 patients, 7 males and 33 females, mean age 48 years (min 31–max 77). One patient was affected from bilateral pronator syndrome and 17 patients were performing manual works with upper limb overuse. The EMG was performed in all patients. The diagnosis was based on symptoms and clinical tests and in 16 cases also with the dynamic ultrasound help. The patients were treated conservatively (neurotrophic drugs, physiotherapy, and rest) for a period ranging from 2 to 4 months. 38 of 40 patients underwent surgical decompression of the median nerve in the forearm. All 38 patients were subjected to postoperative rehabilitation treatment. The Quick-DASH and VAS scores at rest and during the daily activities, paresthesias, and fatigability of the upper limb at time 0 (preoperative), at 1 and 3 months postoperative, were evaluated. Data were evaluated by the t-test.

Results: For two patients, the improvement in symptoms was obtained with the conservative treatment. 38 patients (39 cases) were treated surgically: the most frequent causes of compression have been the thickening of the fibrous arch of the FDS (31/39) and hypertrophy of the PTM (24/30). The Quick-DASH and VAS scores showed a significant difference between 0 and 3 months in all patients: There was an improvement in upper limb function, the disappearance of numbness and pain

both at rest than during activities. The dynamic US identified the site of compression of the median nerve in 16 of 16 cases
Conclusions: The history of repetitive manual activities, clinical examination, and the use of dynamic ultrasound have proven useful in guiding towards a correct diagnosis and appropriate treatment. Surgical decompression, in our cases has proven effective in alleviating symptoms and resuming daily activities.

A-1136 FUNCTIONAL OUTCOMES OF THREE TREATMENT MODALITIES IN THUMB CMC OSTEOARTHRITIS: EATON STAGE–DEPENDENT DIFFERENCES

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Introduction: Carpometacarpal (CMC) osteoarthritis of the thumb is a progressive degenerative disorder leading to pain, impaired strength, reduced dexterity, and functional limitation. Although multiple interventions exist, including Mini TightRope suspensionplasty, their functional effectiveness varies across disease stages. Understanding stage-specific response patterns is essential for guiding treatment selection.

Aim: This study aimed to compare pain levels, grip and pinch strength, dexterity performance, and thumb opposition function among patients with Eaton stage 2–4 CMC osteoarthritis treated with TightRope, LRTI, or steroid injection, and to explore functional differences within each stage.

Material & Methods: Twenty-two right-hand-dominant patients aged 43–73 years (mean 62), were evaluated. Treatments included TightRope (n=10), LRTI (n=4), and steroid injection (n=8). Eaton stage distribution was: stage 2 (n=2; both steroid injection), stage 3 (n=16; TightRope n=8, LRTI n=3, injection n=5), and stage 4 (n=4; TightRope n=1, LRTI n=1, injection n=2). Outcome measures included VAS pain (activity, rest, night), grip and pinch strength, TDX functional score, 9-Hole Peg Test (9HPT), and Kapandji opposition score. All results were recorded using final follow-up values.

Results: Stage 2 patients treated with steroid injection showed mild pain at rest and night but high during activity (VAS 10/4/2). Grip strength averaged 18.5 kg (contralateral 17 kg), lateral pinch 1.8 kg (1.3 kg), tripod 2.0 kg (3 kg), and key pinch 1.3 kg (2 kg). Functional scores indicated high limitation (TDX 74), while dexterity (9HPT 25–26s) and thumb opposition remained preserved (Kapandji 9).

Stage 3, TightRope demonstrated good outcomes with low pain scores (activity/rest/night: 2/2.5/1), strong grip (24.8 kg), and balanced pinch values (tip/key/tripod: 1.8/3.6/3.4 kg). Functional capacity was moderate (TDX 33.1), and dexterity was efficient (9HPT 26–27s). LRTI patients showed similar grip strength (25.3 kg) but lower pinch performance and similar TDX values (31). Steroid injection resulted in higher pain (activity/rest/night: 4.2/2.2/0) but grip (25.6s) and pinch values (tip/key/tripod: 1.5/3.3/3.2) comparable to TightRope, with preserved thumb mobility (Kapandji 9).

Stage 4 The single TightRope patient demonstrated the highest strength parameters (grip 35 kg, tripod 5.5 kg), 8 Kapandji and 9HPT 21.5s. LRTI demonstrated lower strength (grip 16 kg, pinch 0.5 kg) and greatest functional limitation (TDX 46), despite acceptable dexterity times (23.1s). Steroid injection yielded intermediate results with grip 18 kg, pinch 2.5–3.0 kg, Kapandji 8. Activity-related pain remained elevated for both LRTI and injection (VAS 5), while rest pain was minimal (both 0).

Across stages 3–4, TightRope consistently showed superior strength-related outcomes, whereas steroid injection maintained moderate performance. LRTI presented greater limitation, particularly in advanced degeneration.

Conclusions: TightRope offered favorable functional outcomes in mid-to-late-stage CMC osteoarthritis, particularly

regarding grip and pinch strength. Steroid injections provided reasonable improvements and preserved dexterity but were less effective in advanced disease. LRTI demonstrated limited strength recovery and higher functional restriction. For Eaton stage 2, steroid injection may represent an appropriate first-line option due to preserved dexterity and early-stage function. Additionally, rehabilitation is required to achieve better outcomes. For Eaton stage 3, TightRope suspensionplasty appears advantageous given its balanced pain reduction, strength recovery, and maintained fine motor performance. Although findings suggest stage-dependent treatment advantages, small cohort limits generalizability, and larger controlled studies are needed.

A-1137 THE ARCUATE LIGAMENT CONCEPT: FASCIAL COMPRESSION POINTS OF THE LATERAL FEMORAL CUTANEOUS NERVE IN MERALGIA PARESTHETICA

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Introduction: Meralgia paresthetica is often caused by entrapment of the lateral femoral cutaneous nerve (LFCN) near the inguinal ligament. Anatomical studies of the LFCN canal suggest additional compression points distal to the usual site.

Aim: We introduce the concept of arcuate ligaments of the LFCN canal and assess their role as major compression sites.

Material & Methods: Nineteen consecutive patients with refractory meralgia paresthetica underwent surgical exploration and decompression of the LFCN. Demographics, symptom duration, and follow-up were recorded. Preoperative assessment included the location of maximum tenderness, Tinel-like sign, and, when available, ultrasound (US). Intraoperatively, we documented the LFCN course at the ASIS, hourglass constrictions, branching pattern, and the presence of fascial arches ("arcuate ligaments") along the canal.

Results: The mean age was 45 years, with a mean symptom duration of 5 years and an average follow-up of 8 months. Tenderness and Tinel's sign clustered around the ASIS and the sartorius–tensor fasciae latae (TFL) canal. Ultrasound (12 patients) showed focal thickening, medial emergence, or neuroma in 10 cases. Intraoperatively, the LFCN ran medial to the ASIS in most nerves and exhibited hourglass constrictions in 17 of 18 documented cases. An arcuate ligament—a curved fascial arch forming the roof of the canal—was involved in about three-quarters of nerves with hourglass deformity, either as the only visible entrapment or combined with other sites. We identified four configurations: a proximal SA–TFL arcuate ligament at the ASIS level (Figure A) ; a distal SA–TFL arcuate ligament at the distal edge of the canal (Figure B+C+D); a medial arcuate ligament formed by rectus femoris fascia(Figure E); and a lateral arcuate ligament formed by the medial fascial edge of the TFL (Figure F) . Multiple branches were present at the symptomatic level in nearly 40% of nerves, including one case with a deep TFL branch and two superficial branches.

Conclusions: Arcuate ligaments of the LFCN canal represent the dominant compression sites in this surgical series and support a multi-level canal model in which the nerve may be compressed proximally, medially, distally, and laterally. Complex branching around these fascial arches, including deep TFL branches, underscores the risk of partial decompression if the entire canal is not systematically explored and released.

A-1139 PREDICTING HEALTHY GROWTH OF THE RADIUS AND ULNA IN 3D

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Introduction: For corrective forearm osteotomies, growth must be considered to develop an optimal pre-operative plan. Earlier research using statistical shape modelling has shown that the normal development of the radius and ulna involves scaling and growth plate development. Because skeletal development is negligible over short time spans, we want to know whether a simple scale of the radius and ulna based on bone-length changes from a cross-sectional dataset is sufficient for predicting bone shape after 1 year, compared with statistical shape modelling.

Aim: to predict radial and ulnar shape in 3D using statistical shape modelling and compare it to uniform scaling based on change in bone length.

Materials & Methods: 157 3D models of the radius and ulna, generated for pre-operative planning of forearm corrective osteotomies, were used to train a statistical shape model (SSM) and a regression model. For the SSM, point distribution models were generated, and principal component analysis revealed shape modes that describe at least 0.5 millimetre changes relative to the mean shape. Scores for these modes were regressed on age; significant associations were used to predict scores at a later age, while others were held constant. For scaling, a scaling factor was obtained by measuring bone length. Using linear regression, bone length was found to be positively correlated with age. For both models, the change in score or length was based on the difference between the baseline and follow-up predictions. For research purposes, 15 patients had a follow-up scan available on average 16 months later. Predicted bone using the statistical shape model and the scaling was compared to the scanned bone by measuring the distance between the full surfaces in millimetres (mm). This difference was expressed as the root-mean-squared error (RMSE). Mean differences between SSM and scaling were compared using a paired t-test, and the 95% confidence intervals were given.

Results: preliminary results from 7 radius bones showed a root-mean-squared error of 0.462 mm for the statistical shape model and 0.499 mm for the scaling, with a mean difference of -0.037 (-0.092 to 0.018), which was not significant ($p = 0.151$). For 7 ulna bones, the root-mean-squared error of the statistical shape model was 0.578 mm and 0.629 mm for the scaling. The mean difference was -0.051 (-0.098 to -0.004), which was significant ($p = 0.039$).

Conclusions: SSM is equal to scaling for predicting radius shape one year later. For the ulna, the SSM performs better, but the difference of -0.051 mm is clinically insignificant. From visual inspection, we see that SSM performs better for the ulna because it accounts for the development of the olecranon, which undergoes significant changes during growth. Further distinguishing between joints and diaphyseal regions must show if the error is acceptable at every part of the bone.

A-1140 ELBOW ARTHROPLASTY FOR ACUTE DISTAL HUMERUS FRACTURES IN ELDERLY PATIENTS: A CASE SERIES

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Introduction: In the treatment of distal humeral fractures in the elderly, prosthetic treatment is increasingly used to regain stability and functional movement. Total elbow arthroplasty (TEA) remains a reliable solution in these situations, offering predictable pain relief and allowing early mobilization. Nonetheless, concerns regarding implant longevity and postoperative activity limitations have led surgeons to consider distal humerus hemiarthroplasty (DHH) in cases with adequate bone stock, as it preserves part of the native joint and avoids some drawbacks associated with TEA.

Aim: This study reviews the one-year postoperative course of three cases of patients over 75 years of age treated with elbow prostheses: two cases treated with hemiarthroplasty and one treated with total elbow arthroplasty, all performed for unreconstructible and very distal humeral fractures. Our aim is to describe early clinical outcomes and functional recovery, providing insight into their mid-term evolution.

Material & Methods: From December 2021 to March 2025, three female patients aged 77 to 83 underwent elbow replacement for acute distal humerus fractures classified as AO type 13C3. The procedures were performed via a bilateral paratricipital approach. Postoperative management included early passive and active mobilization between 7 and 18 days after surgery. Clinical evaluation was assessed using the Mayo Elbow Performance Score (MEPS), Oxford Elbow Score (OES), Visual Analog Scale (VAS) for pain, and range of motion.

Results: Three female patients were included. Mean patient age at surgery was 79.3 years (range, 77–83). Two patients underwent hemiarthroplasty (one combined with lateral humeral plate synthesis) and one total arthroplasty. The mean flexion–extension arc was 120° (range, 100°–140°), with complete pronosupination in all cases, at one-year follow-up. The patient treated with hemiarthroplasty and lateral plate synthesis had a ROM of 130°/10° (arc 120°), demonstrating a 10° extension deficit compared to the hemiarthroplasty-only case, which achieved full extension (140°/0°, arc 140°). The total arthroplasty case presented a range of 130°/30° (arc 100°), which had the largest extension deficit (30°). The mean Mayo Elbow Performance Score (MEPS) was 67.5 points and the mean Oxford Elbow Score (OES) was 29 points. Two patients reported moderate pain (VAS 6), while one patient was pain-free (VAS 1).

Conclusions: Elbow arthroplasty (hemiarthroplasty or total arthroplasty) is a valid therapeutic alternative for the management of complex distal humerus fractures (AO 13C3) in elderly patients. The procedure allowed for early mobilization and was associated with satisfactory functional results, although with persistent moderate pain. The stiffness observed was minimal, highlighting that the combination of osteosynthesis and prosthesis may worsen outcomes.

A-1141 AUDIT OF SINGLE-CENTRE TIMING FOR ACUTE MAJOR NERVE REPAIR

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Introduction: The optimal timing for acute major nerve repair remains unclear, with clinical data inconsistent. Animal studies (Gutmann & Holubar 1950; Gilliatt 1972; Chaudhry 2000s) demonstrate irreversible muscle and nerve deterioration beginning around 72 hours post-injury, supporting early repair. However, precise clinical timing thresholds remain undefined. We conducted a single-centre study to evaluate functional outcomes following complete end-to-end or graft repairs of median and ulnar nerves and to assess whether time to surgery influences recovery.

Aim: To evaluate the impact of time to operative repair on motor and sensory recovery following acute median and ulnar nerve transections at a single tertiary trauma centre.

Material & Methods: A retrospective single-centre cohort (December 2017–September 2025) identified adult patients with operatively confirmed complete median or ulnar transections distal to the elbow undergoing end-to-end or graft repair. Nerve decompressions, transfers, non-traumatic causes, and cases without follow-up MRC data were excluded. Extracted variables included time to surgery, follow-up duration, and final MRC and TENS scores. Successful outcome was defined as MRC ≥M3, with ≥M4 analysed separately. Primary outcomes were time to repair, proportion of successful repairs <72 h versus ≥72 h, and correlation between time to surgery and functional recovery.

Results: Of 118 potential cases, 72 repairs had complete motor outcomes (27 median, 45 ulnar); 76.4% were male and 57% involved the left limb. Overall, 65.3% achieved $\geq$ M3 and 45.8% achieved $\geq$ M4 at final review. Median nerve repairs achieved $\geq$ M3 in 55.5% (15/27) and ulnar nerve repairs in 71.1% (32/45). Seventy-six percent of repairs occurred within 72 hours, with $\geq$ M3 recovery rates of 65.5% (<72 h) versus 64.7% (≥ 72 h). Mean time to repair was 74.2 ± 32.7 h, with a median of 38.7 h (IQR 49.5) among patients with complete follow-up. Median follow-up duration was 828.8 days (IQR 847.5). Final functional scores demonstrated a median MRC 4 (IQR 3.5) and TENS 5 (IQR 5).

Spearman correlation demonstrated a weak negative association between increasing time to surgery and motor recovery ($\rho = -0.26$, $p = 0.19$) and a moderate negative association with sensory recovery ($\rho = -0.38$, $p = 0.043$). There was no significant monotonic association when analysing only MRC as the primary endpoint, though trends favoured earlier repair.

Conclusions: Timing appears to influence functional outcomes following major nerve injury, with trends toward better motor and sensory recovery after earlier repair. However, the critical therapeutic window remains undefined. These findings support the need for rigorous, prospective, multi-centre investigation—potentially through a Multi-Arm Multi-Stage (MAMS) trial—to establish evidence-based timing thresholds and guide decision-making in early nerve repair.

A-1142 CASE REPORT: DISPLACED FIFTH METACARPAL FRACTURE – OPEN REDUCTION AND INTERNAL FIXATION WITH PLATE AND SCREWS IN AN ELITE MTB ATHLETE WITH RAPID RETURN TO COMPETITION

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Introduction: Metacarpal fractures are common in athletes, but data specific to cycling, particularly elite mountain biking, are extremely limited. Systematic reviews on athletes report that operatively treated metacarpal fractures generally allow return to sport in 1.8–3.4 weeks, though protocols are heterogeneous and mostly derived from contact sports (Geoghegan et al., 2021; Phelps et al., 2025). Case series in professional contact athletes describe return to competition after metacarpal fixation within approximately two weeks (Yalızis et al., 2017). However, no published reports document elite cyclists undergoing hand surgery with rapid return to competition, while the only cycling case involves conservative management. This highlights a significant knowledge gap, particularly when athletes face imminent competitions, where the choice between immediate surgical intervention (with potential risks such as infection or injury to surrounding structures) and conservative management (with risk of secondary displacement and delayed surgery) remains unclear. Aim: To present a case of displaced fifth metacarpal fracture in an elite MTB athlete treated with open reduction and internal fixation, allowing early participation in competition, and to stimulate discussion on optimal management of elite athletes with imminent events.

Material & Methods: Patient: 1 elite MTB athlete with displaced fifth metacarpal fracture.

Surgical treatment: Open reduction and internal fixation with plate and screws.

Multidisciplinary team: 1 hand surgeon, 2 hand therapists.

Functional assessments:

VAS (pain)

Jamar dynamometer (grip strength)

Active range of motion (AROM)

Results: No secondary displacement

No postoperative infections

Early participation (after 1 week surgery) in a competition without complications

Progressive return to training without major difficulties

After wound healing (around 3 weeks), a combined rehabilitation program was implemented:

- Progressive proximal strengthening (shoulder)
- Progressive strengthening of the hand (intrinsic/extrinsic muscles)
- Wrist stability and control exercises
- Focus on prevention of future injuries (ligaments, TFCC), relevant for elite MTB performance

Conclusions: In this case, immediate surgical intervention prior to competition was safe and effective, without secondary displacement or infection, allowing rapid return to elite-level activity. Given the lack of published reports on elite cycling athletes, this case provides a novel contribution to the discussion on optimal management of metacarpal fractures in athletes with high-demand schedules.

A-1143 CORRECTIVE OSTEOTOMY OF A DIAPHYSEAL RADIUS MALUNION USING 3D CUSTOM GUIDES

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Introduction: Rotational malalignment is a well-known complication following diaphyseal radius fractures and can be responsible for functional complaints. With the use of derotating osteotomies the initial rotational malalignment can be restored, however, the ideal degree of rotation is often difficult to achieve without proper planification tools. This is where virtual 3D preoperative planning and design of cutting guides with 3D printing becomes useful, achieving better results in terms of surgical accuracy and timing Aim: To expose a clinical case of a corrective osteotomy for a rotational malalignment following a diaphyseal radius fracture with 3D preoperative planning and custom 3D printed surgical osteotomy guides. The surgical technique, as well as clinical and radiographic outcomes will be reported

Material & Methods: An 18 y/o male patient presents with a history of a proximal diaphyseal left radius fracture treated with a cast. During follow-up a rotational deformity is observed, as well as clinical functional limitation to perform pronosupination together with DRUJ instability. An MRI is then performed, with no evidence of FCT involvement. It was decided then to perform a corrective osteotomy with the aid of 3D virtual planning and the design of custom 3D printed surgical guides, together with a PSI (patient specific implant) to fix said osteotomy

Results: Satisfactory clinical and radiographic outcomes have been achieved, with a complete pronosupination ROM (range of movement) and adequate DRUJ stability

Conclusions: The use of 3D printed surgical guides for corrective osteotomies of the radius following a diaphyseal radius fracture with malrotation alignment is a safe and reproducible method to achieve satisfactory clinical and radiographic outcomes. Furthermore, this method has been proved to improve accuracy and surgical time

A-1144 EFFECT OF DRUJ PINNING ON PAIN AND JOINT CONGRUITY FOLLOWING TFCC REPAIR: A CT ASSESSMENT

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Introduction: Distal radioulnar joint (DRUJ) instability is a known sequela of triangular fibrocartilage complex (TFCC) injury. Although TFCC repair restores anatomy and function, outcomes may be compromised if instability persists. Temporary DRUJ pinning has been proposed, but prior studies focus mainly on stability, ROM, and grip strength. CT imaging offers

objective evaluation of DRUJ congruity. This study investigates whether DRUJ pinning improves congruity and reduces pain. Aim: To evaluate whether temporary DRUJ transfixation (pinning with K-wire) after TFCC repair improves postoperative pain and DRUJ congruity as assessed by CT imaging

Material & Methods: This comparative study included patients who underwent arthroscopic or open TFCC repair for symptomatic DRUJ instability. Two groups were analyzed: Group A (repair + temporary DRUJ transfixation with a K-wire for 6 weeks) and Group B (repair only). All patients underwent postoperative CT assessment of DRUJ congruity using axial imaging and standard quantitative parameters (subluxation index, radioulnar gap). Pain was assessed using the Visual Analogue Scale (VAS), and functional outcome scales were recorded during follow-up.

Results: Patients in Group A demonstrated significantly improved DRUJ congruency on CT, with lower subluxation indices and more centrally reduced joints compared with Group B. The pinned group also showed lower pain scores (VAS) in the early postoperative period. No major complications were noted, apart from minor expected stiffness that improved with physiotherapy. Final range of motion and overall functional scores were comparable between groups.

Conclusions: Temporary DRUJ transfixation following TFCC repair enhances early DRUJ congruity on CT imaging and is associated with reduced postoperative pain. These findings suggest that DRUJ pinning may be beneficial in selected patients with preoperative instability or intraoperative signs of residual laxity. Further prospective studies are warranted to confirm long-term functional outcomes

A-1145 ACUTE TRAUMATIC MUSCULOTENDINOUS AVULSION OF THE FLEXOR POLLICIS LONGUS IN PEDIATRIC AGE: CLINICAL CASE

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Introduction: Avulsions from bony insertion are common and have been studied extensively. But avulsions from musculotendinous junction are rare. As far as we have knowledge, there are few reported cases of musculotendinous avulsions in a child

Aim: Description of the therapeutic management, surgical technique used and results in a rare injury due to traumatic miotendinous avulsion of the flexor pollicis longus after direct trauma in a pediatric patient

Material & Methods: We report the case of a 11-year-old patient who sustained a direct trauma on the thenar eminence causing an open traumatic proximal avulsion of the flexor pollicis longus ,thumb pulleys injury and thenar muscles damage. The surgical reconstruction was performed in two stages. Firstly, the pulleys were repaired and FPL was referenced above flexor palmaris longus. The second stage consisted on miotendinous sewing and encapsulation of the tendon into the muscle belly

Results: At 6 months of follow-up , full range of movement was observed , and the strenght and pinch grip were comparable to the uninjured hand

Conclusions: Traumatic avulsion of the flexor pollicis longus in pediatric patients is very rare with only a few case reports in the literature. The technique of repairing myotendinous avulsion by encapsulating the tendon of the remaining muscle belly is an effective treatment

A-1146 SCAPHOLUNATE LIGAMENTOUS LAXITY – IS THIS A ONE-SIDED PROBLEM?

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Introduction: Wrist pain over the scapholunate ligament (SL) region is often linked to SL injury or the presence of an incipient ganglion cyst. During physical examination, assessment of the contralateral side can be helpful to objectively judge the degree of laxity and the presence of non-symptomatic ganglion cysts.

Aim: The aim of our study was to assess the restriction of mobility of the wrist and the presence of laxity on both the painful and the contralateral side for a more objective comparison.

Material & Methods: Prospective data collection was performed between October 2022 and July 2024 at the Hand Clinic, Budapest. Inclusion criteria were adult patients with one-sided, non-traumatic wrist pain. Range of motion (ROM) was examined as well as the presence of tenderness over the SL, Watson-test and SL-ballottement positivity and the presence of an incipient ganglion cyst on both the symptomatic and on the contralateral side. Patients with positive findings were compared to patients with negative findings using Mann-Whitney U tests.

Results: 142 patients met the inclusion criteria. Tenderness over the SL was observed in 96 (67%) cases, Watson-test positivity present in 116 cases (82%), SL-ballottement test was positive in 110 cases (77%) and incipient ganglion cyst was observed in 106 cases (75%). Patients with Watson test positivity had significantly lower ROM on the symptomatic side regarding flexion ($p=0.003$), extension ($p=0.044$) and regarding flexion on the non-symptomatic side ($p=0.000$). Patients with SL-ballottement positivity had significant restriction of flexion on both the symptomatic ($p=0.005$) and on the contralateral side ($p=0.003$).

Patients with tenderness over the SL had Watson-test positivity in 92.7%, and SL-ballottement positivity in 82.6%, while incipient ganglion cyst was present in 87.5%.

Fisher' Exact Tests found that there was a significant association between positive findings on the symptomatic side and positive findings on the non-symptomatic side ($p=0.000$) regarding all four examined variables.

Conclusions: Patients with one-sided complaints in the SL region often have similar, non-symptomatic findings on the contralateral side, at a lesser degree. Thorough physical examination can help early detection of underlying complaints, contributing to more effective diagnosis and management of chronic wrist pain.

A-1147 DIT: A NEW DEVICE TO BUILD PULLEY PROTECTION ORTHOSES

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Introduction: Injuries and disorders affecting the annular pulleys of the flexor tendon system—such as A2 or A4 pulley ruptures, stenosing tenosynovitis, and post-surgical conditions—require precise, well-fitted orthotic support to optimize tendon biomechanics and facilitate functional recovery. Existing splinting methods vary widely in design and application, and their effectiveness depends heavily on the clinician's skill, material handling, and access to specialized tools. To address these challenges, a new hand therapy tool has been developed, grounded in current scientific evidence, to streamline and standardize the manual fabrication of thermoplastic orthoses for annular pulley pathologies.

Aim: The aim of this project was to create and validate a practical, evidence-based tool that enables clinicians to manually

fabricate customized thermoplastic ring orthoses targeting A2 and A4 pulley conditions with improved precision, reproducibility, and therapeutic effectiveness.

Material & Methods: A comprehensive literature review was conducted to identify the biomechanical principles, therapeutic requirements, and orthotic parameters shown to be effective in treating annular pulley injuries. These findings informed the design of a new, manually operated tool capable of guiding the shaping, angulation, and pressure distribution of thermoplastic material during splint fabrication. Hand therapy clinicians with experience in orthotic management were recruited to test the prototype in a clinical environment.

Results: The evidence-based tool significantly improved the consistency and anatomical accuracy of thermoplastic orthoses designed for A2 and A4 pulley support. Clinicians reported enhanced control during manual molding and greater confidence in achieving the targeted biomechanical properties recommended in the literature. Fabrication time decreased compared to conventional freehand methods, while patient-specific customization remained fully achievable. Overall, the tool demonstrated high usability and was positively rated for its educational value, particularly for less experienced clinicians.

Conclusions: This project has resulted in the development of a novel, evidence-based tool for hand therapy that facilitates the manual creation of precise thermoplastic orthoses for annular pulley injuries. By integrating scientific findings into a practical design, the tool enhances the standardization, efficiency, and therapeutic quality of ring orthoses used in the management of A2 and A4 pulley ruptures, tenosynovitis, and post-surgical conditions. Its implementation may contribute to improved patient outcomes in flexor pulley rehabilitation.

A-1148 CAN PREOPERATIVE BIOPSIES IN PERIPHERAL NERVE SHEATH TUMORS BE PREVENTED BY ULTRASOUND AND MRI IMAGING?

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Introduction: Schwannomas are heterogeneous peripheral nerve sheath tumors. Diagnosis relies on clinical assessment, ultrasound (US) and magnetic resonance imaging (MRI). The lack of standardized imaging criteria often results in preoperative biopsies, which may cause sensory-motor deficits.

US is widely available, noninvasive and ideal for visualizing nerve tumors and their relation to the associated nerve. MRI provides useful structural and signal information but is costly, less accessible and limited in detecting small nerves.

Aim: The study aims to identify the most frequent preoperative US features in histologically confirmed schwannomas, along with MRI characteristics as a basis for developing a more standardized imaging assessment of peripheral nerve sheath tumors.

Material & Methods: We retrospectively reviewed histologically confirmed schwannomas treated at our institution between 2020 and 2025, analyzing preoperative imaging with US and, if available, MRI. US evaluated the presence of an entering/exiting nerve, margin characteristics, the position of the mass within the involved nerve, fascicular structure and intratumoral degenerative features. With MRI signal characteristics on T1- and T2-weighted sequences, fat-saturated T2 appearance, contrast enhancement patterns, and the presence of specific signs (thin hyperintense rim, target sign, or split-fat sign) were evaluated. Demographic data included lesion location, size, nerve of origin along with biopsy frequency. **Results:** 32 histologically confirmed schwannomas were included in 19 men (65.6%) and 10 women (34.4%) with a mean age of 56 ± 15.5 years (range: 19–85 years).

Schwannomas were located on limbs (87.5%), trunk (6.25%), and the brachial plexus (6.25%). The most common nerve of origin was the N. tibialis and its branches (25%).

On US, an entering/exiting nerve was observed in 65.6% of cases. No fascicles were identifiable in the center of the tumors, attributable to the displacing growth pattern. 71.4% of lesions were eccentric and 28.6% central to the associated nerve. Most tumors had clear margins (96.9%). Intratumoral cysts were present in 50.0% and degenerative features in 34.4%. On MRI, schwannomas were isointense on T1-weighted sequences in 76% and hyperintense on T2 in 84% of cases. Diffuse homogeneous enhancement and T2 fat-saturated hyperintensity with homogeneity were each seen in 52%. A thin hyperintense rim appeared in 44%, while the target sign and split-fat sign were present in 20% and 52% of tumor. 40.6% of cases have been biopsied with the risk of causing temporary sensory-motor deficits or pain.

Conclusions: US is a valuable, non-invasive tool for the preoperative evaluation of schwannomas with the added advantage of clearly visualizing the entering and exiting nerve. US has known limitations in visualizing large or deep lesions, especially in patients with high BMI. MRI offers complementary - though nonspecific - information with signal characteristics on T1 and T2 weighted sequences improving diagnostic confidence in larger tumors in anatomically complex regions.

A standardized imaging approach, combining in the first line US and secondly MRI, may enhance diagnostic confidence and ultimately reduce the need for invasive biopsies.

A-1149 ESTABLISHING A MULTIDISCIPLINARY CLINIC FOR COMPLEX UPPER LIMB NEUROMUSCULAR CONDITIONS Charmilie Chandrakumar, William Goodison, Anuhya Vusirikala, Katrina Buchanan, Mike Elvey, Alistair Hunter *University College Hospital, London, UK*

Introduction: Upper limb neuromuscular conditions pose complex functional challenges, often requiring coordinated multidisciplinary management to optimise outcomes. Traditional single-specialty pathways may result in fragmented assessment and delayed intervention. There is increasing recognition that non-surgical and surgical decision making for these patients should be within the context of a multidisciplinary clinic. A dedicated upper limb neuromuscular multidisciplinary team (MDT) clinic was established within our tertiary referral hospital. This integrates specialist surgical, rehabilitation and therapy expertise into a single appointment consultation model.

Aim: To evaluate service activity, interventions, and early outcomes from the first cohort of patients managed through this MDT clinic.

Material & Methods: A retrospective service evaluation was conducted of all patients attending the MDT clinic between July 2024 and September 2025. Data extracted from clinic records included patient demographics, referral sources, indications for referral, symptom chronicity, baseline functional concerns, waiting times, interventions initiated, and qualitative outcomes. The MDT comprised orthopaedic hand surgeons, rehabilitation medicine physicians, physiotherapists, and occupational therapists, enabling comprehensive assessment and management planning during a single visit.

Results: Six MDT clinics were conducted during the evaluation period, with 12 patient attendances (6 female, 6 male), including two follow-up reviews. The median patient age was 60.5 years (range 42–89). Most referrals originated within the Greater London area, with a small number from other regions.

Referral indications were heterogeneous and included post-stroke hemiplegia (n=5), progressive contractures (n=7), spasticity-related dysfunction (n=4), and long-standing neuromuscular impairments (n=2) affecting activities of daily living. Presentations were typically chronic, with a median symptom duration of 30 months (range 17–240 months), often following previous interventions including botulinum toxin injections and splinting.

The mean waiting time from referral to first MDT appointment was 84.9 days, and the mean interval from MDT assessment to surgical intervention was 63.3 days. MDT review enabled simultaneous evaluation of neurological status, functional impairment, surgical suitability, therapy requirements, and psychosocial barriers to care. Non-surgical management

(physiotherapy, occupational therapy, splint provision, and further botulinum toxin therapy) was instituted for seven patients, while three patients proceeded to surgical intervention with coordinated peri-operative rehabilitation planning. All surgically treated patients reported improvements in pain, limb positioning, hygiene, and functional use, with no major complications observed. MDT discussion frequently altered anticipated management compared with sequential single-specialist pathways, preventing unnecessary surgery in some cases, identifying suitable surgical candidates, and expediting initiation of therapy. The clinic also reduced the need for multiple departmental appointments and centralised regional expertise. Barriers to service engagement, including language difficulties and non-attendance, were identified and addressed through MDT coordination.

Conclusions: This early evaluation demonstrates the feasibility and clinical value of a dedicated upper limb neuromuscular MDT clinic for managing the complex, chronic conditions. The integrated model facilitated efficient decision-making, reduced the number of appointments, influenced management strategies and supported meaningful functional improvements across a diverse patient population. Further evaluation with larger cohorts and validated outcome measures is needed to assess long-term clinical impact, cost-effectiveness, and patient satisfaction.

A-1150 PILOT STUDY OF AMYLOID DETECTION DURING CARPAL TUNNEL RELEASE: EARLY FINDINGS FROM AN IRISH COHORT

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Introduction: Carpal tunnel syndrome (CTS) can precede systemic amyloidosis, particularly transthyretin (ATTR) amyloidosis, by many years. National guidance in Ireland now recommends opportunistic amyloid screening during carpal tunnel release (CTR) as a potential early detection strategy.

Aim: This pilot study aims to assess the feasibility of intra-operative tissue sampling, evaluate early prevalence trends, and refine a multidisciplinary amyloid detection pathway at Tallaght University Hospital (TUH).

Material & Methods: This single-centre prospective pilot includes patients undergoing CTR, from whom transverse carpal ligament is routinely sampled for Congo-red staining. Positive samples undergo immunohistochemistry or mass spectrometry typing at the National Amyloidosis Centre, Royal Free Hospital, London. Patients with positive findings are recalled for serum studies (SPEP, FLC, BNP, Troponin-T) and TTR genetic testing. Depending on results, patients are referred to Haematology (paraprotein/MGUS/AL amyloidosis) or to Neurology and Cardiology for suspected or confirmed ATTR amyloidosis. Data collection is ongoing using a shared hospital database.

Results: Ten patients have been enrolled to date. Early observations demonstrate that intra-operative sampling adds no operative risk, the diagnostic workflow is achievable, and multidisciplinary coordination is effective. Full histopathological and biochemical analyses for the initial cohort are pending. We plan to significantly expand enrolment, with the full pilot dataset completed in advance of the FESSH 2026 Congress.

Conclusions: This pilot study supports the feasibility of implementing amyloid screening during CTR and provides the framework for a scalable pathway. Expanded recruitment will allow more robust prevalence estimates and pathway optimisation ahead of wider adoption.

A-1151 REHABILITATION PROTOCOL FOR RADIAL NERVE INJURY

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Introduction: Compression or damage to the radial nerve causes impairment of the hand's extensor system. This leads to an imbalance between the flexor and extensor mechanisms, resulting in a non-functional hand movement pattern known as "drooping hand" (Węgiel & al., 2023). To restore this balance, a series of therapeutic measures are necessary, initiated very early in the treatment phase.

Aim: Our research aims to define the therapeutic measures to be implemented after radial nerve injury (requiring either surgical intervention or not). At what therapeutic timing is it appropriate to introduce them, and according to what procedures? The answers to these questions will help us develop a unified management protocol for the Valais Hospital in Switzerland.

Material & Methods: A review of the literature has been conducted (Swiss Consortium, Cochrane Library and Google Scholar) to synthesize the principles of rehabilitation for radial nerve impairment and to issue practical guidelines.

Results: Fourteen publications were included for a qualitative synthesis. Regarding mobilization, several studies emphasize the importance of maintaining passive joint ranges of motion (Bumbasirevic & al., 2016) and myoelectric stimulation of the extensor system (Gordon & al. 2007 et 2009, Bula-Oyola 2021). A dynamic wrist and finger extension splint worn during the day helps restore functional grip strength (Cantero-Téllez & al. 2016). This system should be combined with a nighttime anti-retraction splint in the intrinsic plus position (Cook, 2011). The motor imagery program helps maintain cortical patterns and prevents motor deprogramming (Novak & Von der Heyde, 2015).

Conclusions: Since its introduction in May 2025, we have applied this protocol to four patients with radial nerve damage. The diversity and early initiation of therapeutic measures offer structured rehabilitation in cases of radial nerve impairment. It requires daily self-exercise by the patients, as well as regular occupational therapy follow-up over several months. Although we still have limited long-term data on this new process, we are observing accelerated functional recovery.

A-1152 PRE-OPERATIVE PATIENT EDUCATION AND LARGE LANGUAGE MODELS: AN ANALYTICAL COMPARISON OF CHATGPT AND DEEPSEEK IN ANSWERING COMMONLY ASKED QUESTIONS IN THUMB CMCJ REPLACEMENT

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Introduction: Large language models (LLMs) are increasingly used as sources of medical information by patients seeking to better understand surgical procedures. As their usage continues to rise, evaluating the accuracy, clarity, and reliability of these tools becomes essential. Thumb carpometacarpal joint (CMCJ) replacement is a commonly performed procedure for osteoarthritis, often involving patients who actively seek online information prior to treatment. This demographic may engage readily with digital platforms such as LLMs for pre-operative education and postoperative guidance.

Aim: To evaluate and compare the performance of two prominent LLMs, ChatGPT and DeepSeek, in addressing common patient questions related to thumb CMCJ replacement. Both models were selected based on growing adoption and accessibility, and assessed for their suitability as patient-facing educational tools capable of producing conversational, human-like responses.

Material & Methods: An expert panel of fellowship-trained hand and upper-limb surgeons curated a set of ten frequently asked patient questions to reflect real-world clinic inquiries regarding thumb CMCJ replacement surgery. Each question

was submitted independently to both LLMs. The resulting responses were assessed by three consultant hand surgeons blinded to the response source. Using a standardised 5-point Likert scale, evaluators rated outputs for clarity, accuracy, and completeness.

Results: ChatGPT demonstrated superior overall performance, achieving a mean score of 4.17 compared with 3.13 for DeepSeek ($t = -3.08$, $p = 0.006$). ChatGPT responses were more frequently rated higher for completeness and clarity, particularly when detailed or nuanced explanations were required, and commonly required minimal additional clarification. In contrast, while DeepSeek responses were generally accurate, reviewers noted occasional vagueness or minor inaccuracies that detracted from reliability and educational value.

Conclusions: These findings highlight meaningful variability in the capability of current LLMs to support patient education for hand surgery. ChatGPT more consistently met expert benchmarks for clarity and thoroughness when responding to queries about thumb CMCJ replacement. As the use of LLMs continues to expand, high-performing models such as ChatGPT may offer increasing value in supplementing pre-operative consultations, enhancing shared decision-making, and supporting patients with postoperative information related to upper-limb procedures.

A-1153 RETURN TO CLIMBING AFTER SCAPHOLUNATE LIGAMENT RECONSTRUCTION: A CLIMBER'S REHABILITATION CASE STUDY

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Scapholunate ligament (SLL) injuries are complex wrist conditions that significantly affect athletes who depend on high grip forces, especially climbers. Surgical reconstruction restores carpal stability, but the return-to-climbing process requires a structured rehabilitation approach that respects healing constraints while progressively challenging wrist function. There is limited literature describing rehabilitation pathways specifically adapted to climbing demands. This case study outlines a tailored approach enabling a safe return to climbing after SLL reconstruction.

Aim: To describe the rehabilitation progression of a climber following SLL reconstruction and identify key therapeutic strategies that supported a gradual, safe return to climbing.

Material & Methods: A recreational climber underwent SLL reconstruction. Rehabilitation began two weeks post-operatively and followed a phased, evidence-based protocol. Early treatment emphasized edema control, protection of the repair, and controlled mobility. Strengthening focused on proprioception and specific muscle control and conditioning. Progressive load exposure included grip-specific tools, closed-chain positions, and climbing-specific tasks. The return-to-wall progression was also structured into three stages: (1) low-load drills on large holds, (2) controlled vertical climbing using closed-hand grips or crimping, and (3) gradual reintroduction of varied grip types and increased mechanical demands on open-hand grips or slopers and pinches. Outcomes were monitored through wrist range of motion, grip strength, pain levels, and climbing-specific measurements.

Results: By week 12, the climber recovered 85% of functional wrist range of motion with minimal pain during exercise. At week 16, the athlete resumed vertical climbing using restricted grip types, reporting improved confidence in wrist stability. By week 24, no signs of instability or swelling recurrence were noted. At final follow-up, the climber returned to pre-injury climbing difficulty with stable wrist function.

Conclusions: A structured, climbing-specific rehabilitation program can effectively support return to climbing after SLL reconstruction. Phased load progression, targeted strengthening, and sport-specific task integration were key to restoring function and confidence. Further research is needed to guide standardized return-to-climbing protocols.

A-1154 MULTICENTER REGISTRY FOR ADULT TRAUMATIC BRACHIAL PLEXUS INJURIES

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Introduction: Adult traumatic brachial plexus injuries (ATBPI) are rare; they occur in approximately 1% of all multisystem trauma patients, with increased frequency (approximately 4%) in motorcycle crashes. For patients, a brachial plexus injury is often a devastating injury which profoundly affects daily upper extremity use and compromises hand function. Surgical disciplines involved in the treatment of ATBPI are neurosurgeons, hand surgeons, plastic surgeons, and microsurgeons.

Aim: To make an inventory of multicenter research in traumatic brachial plexus injuries.

Material & Methods: A literature and internet search was performed to identify multicenter studies and multicenter initiatives that investigate treatment and outcome in patients with traumatic brachial plexus injuries.

Results: No prospective multicenter initiatives to assess outcome were identified. Systematic reviews were conducted to assess 1) specific outcomes, for instance regarding recovery of elbow flexion or specific nerve transfers; 2) diversity in outcome measures; 3) epidemiology; 4) timing of surgery; 5) diagnostic value of imaging. Two papers described a definition of core outcome sets. Three papers explored differences in management and treatment from a perspective regarding international variations between centers.

Discussion: Currently, no studies have comprehensively evaluated the functional outcomes and quality of life following different treatment approaches in ATBPI patients. There is a significant gap in the current management of adult traumatic brachial plexus injury, where treatment algorithms vary widely and there is a paucity of high-quality evidence regarding optimal intervention strategies. A scientific approach using comparative effectiveness research could bring the field forward. We would like to invite the audience at FESSH 2026 to cooperate in a prospective multicenter interdisciplinary registry of traumatic brachial plexus injuries. Only international multicenter cooperation by surgeons from all involved disciplines will enable to finetune optimal treatment for these patients. Please sign up at <https://www.leidennervecenter.org/compare-treatment-atbi>

A-1155 DISTAL POLE SCAPHOID NONUNION IN ADOLESCENTS: A RARE CLINICAL ENTITY

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Introduction: Scaphoid fractures in children and adolescents are scarce, representing less than 3% of all hand and wrist fractures. Furthermore, nonunion in these populations is reported in less than 1,5% of cases, given the better vascularity and the healing potential of the immature skeleton.

Pseudarthrosis of the distal pole of the scaphoid is an even rarer complication, with only 4 cases reported in the literature to date. The rarity of cases limits our knowledge of the etiology, treatment plan, and prognosis of this condition.

Aim: In our study, we present three cases of distal pole scaphoid nonunion in adolescent patients (two females and one male) treated surgically with a palmar approach, open reduction, and internal fixation ORIF) using a headless compression screw (in two cases) and Kirschner wires (K-wires) in one case, with a mean follow-up of 6,5 years.

Material & Methods: Three adolescent patients with distal scaphoid nonunion were treated in our department and were retrospectively reviewed.

Case 1: A 14-year-old female sustained a fall on her outstretched hand (FOOSH) during volleyball. Diagnosis was delayed by almost three months, and patient refusal postponed the surgical treatment until 15 months post-injury. She underwent ORIF via the palmar approach with a headless compression screw and distal radius bone grafts.

Follow-up : 10y

Case 2: A 12-year-old male fell from a height of 2 meters. The fracture was identified and immobilized upon arrival in the Accident and Emergency Department (A&E), but the patient removed the cast within 24 hours and visited physio on his own. Chronic pain led to the diagnosis of distal pole nonunion one year later. The patient consented, and he underwent ORIF via the palmar approach with a headless screw. Follow-up: 2,5y

Case 3: A 15-year-old female patient sustained a FOOSH. She had pain but no diagnosis or treatment until 8 months later, when persisting symptoms led her to a new consultation, where clinical examination and imaging confirmed scaphoid distal pole pseudarthrosis. She underwent ORIF via the palmar approach with K-wires and cancellous bone grafts. Follow-up: 7y
All patients were immobilized postoperatively for 6 weeks. Physiotherapy began with a structured rehabilitation plan. Follow-up included clinical examination, radiographic evaluation, range-of-motion assessment, and grip-strength measurement.

Results: All cases were treated with ORIF via the palmar approach: cases 1 and 2 with a headless screw, and case 3 with K-wires. All cases demonstrated full wrist ROM, and grip strength was almost symmetrical. All patients returned to their previous level of daily life and athletic activities.

Conclusions: Distal pole scaphoid nonunion in adolescents is a rare complication. The three cases in our series had in common delayed diagnosis, inadequate immobilization, repeated trauma, and premature return to activities.

We support that early recognition and adequate immobilization are key factors in preventing the complication of pseudarthrosis of the distal pole of the scaphoid. If so, careful preparation of the nonunion, stable fixation, and bone grafting are sufficient to achieve a solid union.

A-1156 EFFICIENT CONSERVATIVE TREATMENT OF CAMPTODACTYLY IN CHILDREN

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Introduction: Treatment of camptodactyly in children begins with conservative therapy using splints and manual stretching. Preoperative findings are crucial for treatment. Important factors are the age of the child and the extent of the PIP contracture.

Early treatment with splints is beneficial in very young patients, but difficult due to their sensitive skin and fatty hands and lack of cooperation. In infants and toddlers, the Glove-splint (thermoplastic splints in a compression glove) prevent slipping. In preschool children, custom-made thermoplastic splints are used at night and prefabricated dynamic finger splints are used during the day.

Aim: We want to find out how effective therapy with these splints is in the short and long term.

Material & Methods: Included were only camptodactylyes with no other disease association and maximum 2 fingers involved. Since 2015 we have been treating camptodactylyes in over 200 children.

Patients were divided in four subgroups of different age. Excluded were those who did not return or did not cooperate in treatment.

We monitored 109 children during sequential conservative therapy. The biggest age group were 58 infants and toddlers (age 0.8 to 2.8 yrs); 14 preschool kids (age 3.5 to 5.8 yrs); 14 school children (age 6 to 12 yrs), and 22 adolescents (older

than 12 yrs to 17 yrs). Mostly the small finger was affected (94 pat, 42 unilateral; 52 bilateral). In the remaining 14 pat the ring finger or two fingers were involved.

The charts were evaluated according to the initial passive extension deficit of the PIP joint, the duration of splint therapy and the outcome.

Results: In almost all cases, we observed rapid improvement after 6 months. In the preschool group, an average improvement of 30° was observed after 10 months. In the schoolchildren group, the improvement was less pronounced and took 1 to 1.5 years. In adolescents, the improvement took longer and depended heavily on the determination of the individuals concerned.

Conclusions: Conservative treatment of contractures with well-fitting splints in motivated patients and families, and a thorough support by regular checks is necessary. The applied splints were proved to be effective in the age groups, best and quickest in toddlers. Contact every 4 to 6 months for splint control and readjustment and support with motivation of child and parents is essential.

A-1158 AN UNCOMMON PATTERN OF FOURTH WEB SPACE COMMON DIGITAL ARTERY. ANATOMIC REVIEW

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Introduction: Thorough knowledge of the hand's vascular anatomy is essential for the identification and preservation of arterial structures during surgical procedures. While the patterns of the superficial and deep palmar arches are well-documented, more distal vascular patterns remain less studied, with the focus largely restricted to the thumb due to its functional importance.

Aim: To describe and illustrate an unusual vascular pattern of the Common Digital artery (CDA) to the fourth web space, detailing its origin, course, and relationship with adjacent structures.

Material & Methods: A descriptive anatomical study was conducted using the dissection of an adult cryopreserved specimen. The arterial system was injected with red latex for enhanced characterization. The results were documented through detailed iconography.

Results: Agenesis of the CDA to the fourth web space was documented in the specimen. Instead, an artery was observed originating from the radial side of the ulnar palmar digital artery of the little finger, which coursed from the hypothenar eminence towards the fourth web space, crossing deeply to the flexor tendons of the little finger. In the fourth web space, the artery ran alongside the common digital nerve; however, upon reaching the deep transverse intermetacarpal ligament, the artery passed deeply while the nerve maintained its usual superficial course. This arterial path has not been previously reported.

Conclusions: The study describes a previously undocumented and un-iconographed anatomical variant characterized by the CDA to the fourth web space passing deep to the deep transverse intermetacarpal ligament. Knowledge of these rare variants is key in hand surgery to prevent iatrogenic injury and subsequent adverse outcomes during surgical procedures.

A-1159 NEWBORN COMPARTMENT SYNDROME - AN INTERDISCIPLINARY CHALLENGE

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Introduction: Neonatal compartment syndrome (NCS) is a rare, limb-threatening condition. Intrauterine or perinatal events of vascular occlusion are followed by compartment syndrome which in over 90% of cases affect the upper extremities of newborns. Delay in treatment results in loss of function and life-long disability. Cognizance of the condition remains low amongst perinatal providers, while known risk factors for the condition are on the rise in the maternal population. This highlights the need for increased awareness and education for medical professionals as well as improved diagnostic and early treatment.

Aim: We aimed to consolidate current knowledge from literature, as well as from a global survey and additional cases in own experience to improve recognition and management.

Material & Methods: We analyzed 51 publications reporting on a total of 98 cases, 1951–2025, as well as an international survey of 80 cases. Clinical data, maternal factors, treatment, and outcomes were extracted. 3 additional cases in own experience between 2020 and 2025 were analyzed according to the survey and added to the sample.

Results: Sentinel skin lesions (94%) and cyanosis (90%) were the most frequent early signs. Maternal diabetes was present in 19% of reviewed cases; prematurity in 26%. Concurrent vascular occlusion of more than one vessel, including cerebral ischemia, was reported in a notable minority. Fasciotomy within 24 hours was associated with sequelae in just 16.6% of cases, compared to sequelae in over 75% of cases after delayed or absent decompression. Late outcomes commonly included contractures, bone deformities, and growth disturbances. In children with contralateral cerebral palsy the bimanual handling showed impressive the impact of remaining function of the compartment affected hand.

Conclusions: NCS is a clinical diagnosis, most often made postnatally, requiring a high degree of clinical suspicion. While antenatal diagnosis can be achieved by doppler ultrasound following changes in fetal movement noted by the mother or suspicion for vascular involvement such as umbilical vein thrombosis, sentinel skin lesions and flaccid paralysis are key clues postnatally. Early and complete fasciotomy remains the intervention most consistently associated with reduced long-term disability, requiring a discussion about induction of labor where the diagnosis is made antenatally.

A-1160 COMBINED TREATMENT OF WRIST AND TRAPEZIOMETACARPAL JOINT ARTHRITIS

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Introduction: Combined degenerative disease of the trapeziometacarpal (CMC-1) joint and the wrist in the setting of a SLAC wrist presents a therapeutic challenge. Addressing both conditions in a single surgical session may offer advantages in recovery and functional outcomes but is rarely reported.

Aim: To evaluate the early clinical outcomes, safety, and feasibility of simultaneous CMC-1 arthroplasty combined with scaphoidectomy and four-corner fusion in patients with concurrent thumb CMC osteoarthritis and SLAC wrist.

Material & Methods: We retrospectively analyzed our first four consecutive cases treated with simultaneous CMC-1 prosthesis implantation and scaphoidectomy with four-corner fusion. All surgeries were performed ambulatory under plexus anesthesia. Postoperatively, patients were immobilized in a wrist orthosis with thumb inclusion for six weeks. Active-assisted mobilization began immediately after surgery. Complications, pain levels, and range of motion were assessed during follow-up.

Results: All four procedures were completed without intraoperative or postoperative complications. Patients demonstrated early and marked pain reduction along with acceptable wrist and thumb mobility. Healing progressed uneventfully in all cases, and no implant-related issues were observed during the short-term follow-up period.

Conclusions: Simultaneous CMC-1 arthroplasty and scaphoidectomy with four-corner fusion can be performed safely and effectively in a single ambulatory procedure. Our initial short-term results indicate significant pain relief and satisfactory functional outcomes, supporting the feasibility of this combined approach for patients with concomitant CMC-1 osteoarthritis and SLAC wrist.

A-1162 HYPEREXTENSION MALLET INJURY: A FINITE ELEMENT ANALYSIS

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Introduction: Disruption to the delicate balance of the digital extensor mechanism can produce characteristic deformities including swan-neck, Boutonniere and mallet deformities. Mallet injuries are common, characterised by passive flexion deformity of the distal interphalangeal joint (DIPJ). While most can be treated nonoperatively, surgery is indicated for unstable injuries which typically involve an intraarticular fracture with a larger dorsal fragment.

Aim: Contrasting mechanisms of injury (forced flexion and hyperextension) are thought to produce mallet injuries, and it has been hypothesised that unstable injuries involving a large intraarticular fragment result from the hyperextension variant, but this remains to be experimentally confirmed. We aimed to examine this hypothesis using the finite element method.

Material & Methods: Bony anatomy was obtained from CT imaging of the middle and distal phalanges of a cadaveric middle finger specimen. Mesh convergence analysis was performed, and volumetric meshes of linear tetrahedral elements with corresponding size were constructed. The model was completed with articular cartilage, volar plate and proper collateral ligaments. Materials models and parameters were obtained from the literature. Hyperextension injuries were simulated by applying a dorsally-directed axial load to the fingertip, with varying hyperextension moments about the DIPJ. Nodal displacement and element effective stress were analysed using colour-mapped cross sections and boxplots. Ten different load angles were simulated, and three volar plate elasticity parameters were also compared.

Results: In all simulations, highest stresses were concentrated at the insertion of the volar plate, and in the dorsal base of the distal phalanx in an oblique orientation corresponding to the plane of the fracture hypothesised to result from hyperextension injuries. This pattern was consistent between all hyperextension moments, and was not sensitive to variation in volar plate material properties. Volar plate behaviour was appropriate, constituting a static restraint to hyperextension, which varied in magnitude in proportion to the elasticity of the volar plate.

Conclusions: These findings support the hypothesis that a large, potentially unstable intraarticular fracture of the dorsal base of the distal phalanx may be produced by combined axial load and hyperextension, resulting in a characteristic mallet deformity, and crucially likely to require surgical stabilisation. When the congruency of the opposing articular surfaces is lost, the balance of static and active stabilisers of the DIPJ is disrupted and the distal phalanx will tend to sublux. This study lacks experimental validation, and more complex cartilage and soft tissue modelling techniques exist which could enhance the validity of the model. However, the finite element method provides the opportunity to evaluate the injury under a range of conditions which would be costly and difficult to reproduce experimentally.

A-1164 KINEMATIC ANALYSIS AND BILATERAL SYMMETRY IN DYNAMIC IMAGING OF THE DISTAL RADIOULNAR JOINT

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Introduction: Four-dimensional computed tomography (4D-CT) has developed into a powerful modality for quantifying joint kinematics. Accurate assessment of forearm motion is of increasing clinical relevance, particularly for diagnosing motion-related pathologies. Despite the added value of 4D-CT, one should remain vigilant of methodological limitations: the accuracy of finding kinematic parameters, such as the forearm rotation axis, depends on the quality of image acquisition and registration, which can be affected by the signal-to-noise ratio (SNR), Z-coverage, and motion artefacts. In clinical diagnosis and virtual surgical planning, a kinematic reference should be established to differentiate pathological from normal. To this end, the bilateral kinematic symmetry should be determined.

Aim: This work aimed to quantify methodological errors affecting 4D-CT-based distal radioulnar joint (DRUJ) kinematic analysis, provide an accurate description of healthy forearm kinematics, and determine the degree of bilateral kinematic symmetry of forearm rotation.

Material & Methods: Methodological error quantification was conducted using cadaveric forearms and a motorized phantom to isolate the effects of SNR, Z-coverage, and controlled angular velocities on image registration accuracy. For the SNR and Z-coverage acquisitions the cadaveric forearm remained static while the motion phantom rotated distal segments of the radius and ulna around an estimated rotation axis with no relative motion between the bone segments. Segmented 3D bone models of the radius and ulna were then registered to serial 3D-CT- or 4D-CT target frames, and relative radius-ulna motion served as a proxy for error. Subsequent characterization of forearm kinematics and bilateral kinematic symmetry was evaluated in ten healthy volunteers who underwent spiral CT and two 4D-CT scans capturing DRUJ and proximal radioulnar joint motion. A circle-fitting method was introduced to determine the forearm rotation axis from motion trajectories of distal and proximal radial segments. Translations and rotations of the radius relative to other anatomical axes were calculated using the residual transformation matrix.

Results: Low SNR, reduced Z-coverage, and motion artefacts each contributed to registration error, with worst-case values of below 0.5 millimeter/degree for SNR and Z-coverage and 1.1 mm/6.0° for motion. Increased SNR and Z-coverage improved accuracy and precision, whereas rising angular velocity substantially deteriorated both. By tuning the scanning protocol errors could be minimized sufficiently.

In healthy volunteers, the circle-fit method provided highly precise determination of the forearm rotation axis, outperforming the more common finite helical axis analysis. Mean radius translations were ~2.6 mm along the ulnar axis. Rotation around the radial axis averaged ~7° on an average forearm rotation range of motion of 136.5°.

Bilateral comparison demonstrated high symmetry: mean angular deviation between left-right forearm rotation axes was 0.6°, positional difference 0.8 mm, radius translation difference 0.9 mm, and difference in radius axial rotation of 2.6°.

Conclusions: This study showed the possibility of composing an accurate scanning protocol for dynamic DRUJ imaging. Additionally, a method of determining kinematic parameters was introduced and the level of bilateral symmetry was defined.

A-1165 TITLE: ENHANCING AO CLASSIFICATION FOR DISTAL RADIUS FRACTURES: A THREE-DIMENSIONAL APPROACH THROUGH FRACTURE SEGMENTATION AND FRAGMENT NAME TAGGING

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Background: The AO classification is widely used for distal radius fractures but lacks the ability to accurately represent complex three dimensional fracture morphology. This study integrates a fracture name tagging system into the AO framework and evaluates observer agreement. **Methods:** A database of 200 segmented distal radius fractures was used to define tagging rules. Eleven tagging tasks were evaluated by orthopaedic surgeons through a Qualtrics questionnaire. Interobserver agreement was measured using Gwet's AC1. **Results:** Nineteen respondents completed the survey. AC1 for simple fragments was excellent (Q1 = 0.895). Complex metaphyseal fragments showed negative AC1 values, indicating disagreement beyond chance (Q58 = -5.72). Evaluation questions showed high perceived usefulness and value of 3D imaging. **Conclusion:** Three dimensional name tagging improves structure and communication in simple patterns but requires refinement for complex configurations.

Introduction Distal radius fractures remain among the most common fractures in orthopaedic practice. Although the AO classification system provides a widely adopted structure, its two dimensional framework limits accurate representation of complex articular patterns. Three dimensional CT based segmentation allows clear visualisation of individual fracture fragments, supporting the creation of structured tagging systems. This study evaluates the integration of a fragment name tagging system within the AO classification to assess reproducibility and clinical value.

Methods: A dataset of 200 CT segmented distal radius fractures was used to define consistent fragment tags based on distal, metaphyseal and proximal zones, combined with sagittal and axial descriptors. Representative AO 23C2 and 23C3 cases were selected. A Qualtrics survey presented surgeons with eleven tagging tasks. Responses were cleaned and analysed. Gwet's AC1 was calculated for interobserver agreement because Fleiss' kappa cannot be computed from single item tasks. **Results:** Nineteen participants (7 residents, 12 consultants) completed the survey. Agreement varied by fragment type. The simplest distal fragment (Q1) showed excellent agreement (AC1 = 0.895). Intermediate fragments (Q4, Q7) demonstrated mildly negative AC1 values (-0.91 to -0.65). Metaphyseal and multi component fragments showed strong disagreement beyond chance, with Q58 displaying AC1 = -5.72. Participants rated the clarity (mean ~7), usefulness (~8), and 3D imaging value (~9) highly.

Discussion: The findings align with existing literature on AO classification reliability, where kappa values ranging from 0.37 to 0.68 reflect moderate reproducibility for fracture types. Subgroup classifications often perform worse, with published kappa values as low as 0.17 for detailed AO subgroups. The high AC1 for simple fragments confirms strong reproducibility, while negative AC1 values for complex cases highlight areas for refinement in fragment definition, tagging rules and 3D representation. The perceived value of 3D imaging underscores its importance in modern fracture analysis.

Conclusion: Three dimensional fracture tagging enhances clarity and communication for simple distal radius fracture patterns. However, highly comminuted metaphyseal configurations demonstrate substantial variability and require refinement in classification structure and tagging rules. The integration of 3D analysis provides a promising supplement to the AO system.

A-1166 GLABROUS SKINGRAFT FOR HAND INJURY ON THE PALM OF THE HAND AND THE PLANTAR SURFACES OF THE FEET

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A-1167 STATISTICAL SHAPE MODELLING-BASED ASSESSMENT OF VOLAR LOCKING PLATE COMPATIBILITY IN DISTAL RADIUS FRACTURES: A MORPHOLOGY-DRIVEN APPROACH TO IMPLANT SELECTION

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Purpose: To determine whether statistical shape modelling can identify morphology-driven differences in volar cortical anatomy that affect compatibility between patient-specific distal radius geometry and commercial volar locking plate systems. The study aims to establish whether recognised morphological subtypes, particularly those characterised by isolated volar cortical angle variation, can guide evidence-based implant selection beyond traditional one-shape-fits-all plate design.

Methods: Three-dimensional reconstructions of 126 distal radii were analysed using a validated statistical shape model. Four dominant modes of geometric variation were identified, with Mode 2 capturing changes in the volar cortical angle independent of overall size. Nine commercially available volar locking plate systems were virtually aligned to the bone surface using a standardised anatomical reference frame. Implant bone compatibility was quantified using a weighted cost function incorporating plate bone distance, cortical contour mismatch and watershed line constraints. Morphology-specific performance was compared across sex, average anatomy, and Mode 2 deviation levels.

Results: Compatibility varied substantially across plate designs and patient morphologies. One system demonstrated optimal performance in most female configurations, particularly in Mode 2 morphologies exhibiting increased volar cortical angulation, whereas an alternative design performed best in male Mode 2 and average male anatomy. Extreme Mode 2 cases produced the greatest mismatch, with several plate patient combinations exceeding poor fit thresholds (cost > 1.0). Female Mode 2 patients concentrated angular variation within the radial column, while male patients displayed a broader distribution across columns. Approximately 5 to 7 percent of patients fell outside the tolerance of all commercially available implants.

Conclusions: Statistical shape modelling reveals clinically meaningful variation in distal radius geometry that directly influences volar plate performance. Sex specific patterns and Mode 2 driven angular deviations explain why certain implants perform inconsistently across patient groups. Current fixed-angle designs accommodate average morphology but fail in Mode 2 extremes. Integrating SSM into preoperative planning and developing plates tailored to Mode 2 variation could improve compatibility to above 95 percent of patients, providing a morphology-based framework for rational implant selection.

Level of Evidence: Therapeutic Level III, retrospective comparative study

Keywords: distal radius fracture, statistical shape modelling, volar cortical angle, implant performance, patient specific anatomy, volar locking plate design

A-1168 ARTHROPLASTY AS REVISION SURGERY AFTER PREVIOUS THUMB CMC SURGERY – PEARLS AND PITFALLS, OFF-LABEL USE, AND ALTERNATIVES

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Introduction: CMC1 joint arthroplasty has become an established treatment option for advanced trapeziometacarpal osteoarthritis. It may also serve as a revision procedure following failed surgeries involving the trapezium or the base of the first metacarpal. In these revision cases, arthroplasty is technically demanding, as altered anatomical conditions, scar tissue, and reduced bone stock can compromise implant stability and longevity.

Aim: The aim of this study is to outline the pearls and pitfalls as well as the key technical steps of arthroplasty performed as a revision procedure following previous CMC-1 joint surgeries.

Material & Methods: Based on specific cases, we present indications and techniques for revision arthroplasty of the CMC1 joint: prosthesis implantation after malunited Bennett or Rolando fractures, persistent CMC1 dislocation, proximalization of the first metacarpal following trapeziectomy with scaphometacarpal implantation of the endoprosthesis, as well as procedures addressing osseous defects of the trapezium after previous prosthesis implantation.

Results: In five patients with post-traumatic osteoarthritis, implantation of a TMC endoprosthesis resulted in pain relief and functional restoration. Twelve patients treated with scaphometacarpal implantation after trapeziectomy consistently achieved sufficient pain reduction and recovery of hand function; overall patient satisfaction was high. In one additional case, the trapezium was reconstructed using a tricortical iliac crest graft, enabling reimplantation of the prosthetic cup. No major short-term complications were observed.

Conclusions: In our cohort, TMC joint arthroplasty proved to be an effective revision option not only for post-traumatic conditions but also for proximalization after trapeziectomy. Success depends on adapting the procedure to the specific anatomical and biomechanical conditions of the previously operated joint. Surgeons should have solid experience with primary TMC arthroplasty before attempting revision cases. Further clinical studies are needed to compare prosthesis implantation with established salvage procedures such as trapeziectomy or arthrodesis.

A-1169 KINEMATIC EVALUATION OF THE APTIS DRUJ IMPLANT AND DEVELOPMENT OF A NOVEL IMPLANT BASED ON PATIENT SPECIFIC KINEMATICS

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Introduction: Currently, the only semi constrained implant for the distal radioulnar joint (DRUJ) is the implant by Aptis medical. Despite improved function and high patient satisfaction, complication rates up to 44% are reported and revision surgery is common. This discrepancy raises the question whether the patient reported metrics and the functional outcomes are sufficient to assess the performance of the implant. Kinematic analysis enables evaluating the implant's ability in restoring normal motion.

Aim: The aim of this work was to evaluate the ability of the Aptis DRUJ implant to restore healthy kinematics, obtained through 4D-CT imaging of the contralateral side, and to develop a novel implant design concept incorporating patient-specific kinematics.

Material & Methods: Twelve patients with unilateral Aptis arthroplasty and no implant-related complications underwent bilateral imaging consisting of one 3D-CT and three 4D-CT acquisitions to capture pronation–supination at the DRUJ level, at the proximal radioulnar joint level, and to capture wrist flexion–extension motion. The healthy arm was mirrored, allowing direct comparison. Segmented 3D models of the radius, ulna, and capitate were registered to the 4D-CT frames, which enabled visualization and quantification of forearm and wrist kinematics. Forearm rotation axes were computed using a validated circle-fit method in the healthy forearms. These were compared to the arm with Aptis implant. Radius translation along the ulnar axis, wrist flexion–extension range of motion (ROM), and geometric correspondence (Dice coefficient, Hausdorff distance) between corrected and contralateral healthy bones were quantified. A patient-specific implant was subsequently conceptualized based on the normal forearm kinematics of the contralateral arm.

Results: The forearm rotation axis of the implant-treated limb, deviated on average 2.3° from the healthy contralateral axis, resulting in a combined average displacement of 8.2 mm at the DRUJ level. Radius translation along the ulnar axis decreased by 45% (healthy: 2.0 mm; Aptis: 0.8 mm), and pronation–supination ROM was reduced from a median of 144.5° to 104.4°. Wrist flexion–extension ROM decreased from 105° to 88°. Substantial geometric discrepancies between operated and healthy radii were observed (median Dice 0.45), though these did not correlate with kinematic deviations. Using each subject's contralateral kinematics as the restoration target, we formulated a design concept for a patient-specific DRUJ implant that restores the forearm rotation axis to normal based on the contralateral side, potentially addressing limitations inherent to the fixed geometry of the Aptis system.

Conclusions: This study showed the Aptis DRUJ implant considerably alters forearm kinematics and presents a novel implant concept designed to restore normal forearm kinematics.

A-1170 WALANT FOR ACUTE HAND TRAUMA: FIVE YEARS OF OUTPATIENT PRACTICE

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Introduction: Wide-awake local anaesthesia no tourniquet (WALANT) enables real-time assessment of tendon gliding, joint congruency and overall stability during trauma surgery, allowing direct functional evaluation while the patient is awake. This technique has been increasingly adopted for acute hand and wrist injuries because it combines a stable operative field with the possibility of immediate active motion testing and outpatient management.

Aim: To describe a five-year experience of a tertiary hand unit using WALANT as the primary anaesthetic strategy for acute hand and wrist trauma, characterising the treated population and injury patterns. A further aim is to outline how a WALANT-centred pathway supports outpatient surgery, low complication rates and balanced decision-making between stability, motion and service efficiency in routine trauma practice.

Material & Methods: A retrospective review included all adult patients undergoing surgery for acute hand and wrist trauma under WALANT in a tertiary hand unit between 2021 and 2025 (n = 196 procedures). Collected variables comprised demographics, injury pattern, procedure type (including fracture fixation, tendon and nerve repair and soft-tissue coverage), anaesthetic protocol and the use of intraoperative active-movement testing to guide decisions on reduction, fixation and tensioning.

Results: Over the 5-year period, 196 surgeries for acute hand and wrist trauma were performed under WALANT, with women representing 55% of the treated patients. The most frequent bony injuries managed were scaphoid fractures and metacarpal fractures, in which wide-awake conditions systematically allowed intraoperative assessment of stability and motion at the wrist and metacarpophalangeal joints during definitive fixation. All procedures were carried out in

an outpatient surgery setting, and complication rates remained low, with no signal suggesting an increased risk related to the WALANT pathway.

Conclusions: This 5-year experience indicates that a WALANT-centred pathway for acute hand trauma is feasible across a broad spectrum of injuries and supports balanced decision-making between skeletal stability, joint congruency and neuromuscular control through real-time functional testing. These preliminary results, including exclusive outpatient management and low complication rates, warrant further detailed analysis of functional outcomes and resource utilisation and support the continued integration of WALANT into routine hand trauma practice.

A-1171 INTERPRETATION OF LUCENCY AROUND TOTAL WRIST REPLACEMENTS

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Introduction: Lucency around total wrist replacements (TWR) poses diagnostic and management challenges, as some such as failure of osseointegration (FOI) tend to lead to revision; while some including impingement-related osteolysis (IRO) are variable in their prognosis; and others including stress shielding (SS) are physiological and not pathological. Differentiating between these is therefore critical in managing patients following TWR.

Aim: We aimed to determine the incidence of lucency in MOTEC TWR and identify radiographic features that help distinguish between causes.

Material & Methods: We retrospectively reviewed all post-operative radiographs of primary MOTEC TWR cases between 2016 – 2025 at our trust. Modified Gruen's zones were utilised to assess each component, and the lucent area categorised according to the zone of transition, pattern, presence of cavitation or silhouette to assess for common themes. They were then classified into FOI, SS, IRO, or other atypical patterns and correlated with management and outcomes.

Results: Lucency was observed in 28 cases. IRO was the most frequent cause (n=10), followed by FOI (n=9), and SS (n=7). Two cases demonstrated failure of CMC fusion with lucency confined to a single bone. Revision surgery was performed in 11 cases.

SS typically presented as non-progressive, non-cavitating diffuse lucency around the articular ends, which develops into a well demarcated area and requires no treatment. FOI was visible from 3 months radiographically as diffuse lucency initially, then progresses to a well demarcated silhouette around the component. It gives the appearance of stabilising over time; however, this is likely due to implant loosening and subsequent subsidence. IRO, is a historical complication that only occurs with the short-necked prosthesis, produces cavitating, progressive lucency usually initiating at the joint surface and is difficult to distinguish from infection.

Conclusions: Recognition of specific radiographic patterns allows differentiation between different causes, guiding management. The finding of partial integration within a single component highlights the complexity of implant-host interaction.

A-1172 ADDRESSING RADIOGRAPHIC MAGNIFICATION IN WRIST ARTHROPLASTY TEMPLATING: RETROSPECTIVE DATA AND A PRACTICAL MARKER SOLUTION

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Introduction: Pre-operative templating is critical in arthroplasty for implant selection and surgical planning. For MOTEC total wrist replacements, accurate templating is essential due to the precise fit required for the radial and metacarpal components. Under sizing risks failed osteointegration, while over sizing can cause peri-prosthetic fractures. However, radiographs are often magnified due to patient positioning, X-ray beam centring, and source-detector distance. Addressing magnification is vital to avoid implant size mismatches which could impact outcomes.

Material & Methods: A retrospective review was conducted of post-operative radiographs from 40 patients who underwent MOTEC wrist arthroplasty. Radiograph centring and implant sizes were analysed and compared to operative records. To assess variability, multiple radiographs from the same patients on different dates were examined. Additionally, a post-hoc study was performed to assess the utility of opaque skin markers (IZI Medical INDICATOR with 1.5mm calibration lines). Markers were applied on the dorsum of the hand over the second metacarpal and over the wrist along the ulnar axis. Their efficacy in correcting magnification was validated by comparing radiographs of patients with wrist replacements and skin markers against actual implant dimensions.

Results: 63 radiographs were analysed. Average magnification for radial components was 102% (95–108%) and for metacarpal components 101% (96–106%), with a correlation coefficient (r) of 0.46. Notably, magnification discrepancies were observed between components within the same radiograph: one case showed radial magnification at 95% while the metacarpal was 100%; another reversed at 96% vs 100%. The articulating ball, central on imaging, was consistently unaffected. The post-hoc marker study showed the skin markers were easy to apply and provided reliable calibration, with measurements comparable to known implant sizes.

Conclusions: Even minor radiographic magnification affects implant templating in wrist arthroplasty. Skin markers offer a practical solution for standardizing magnification assessment, improving templating accuracy and surgical outcomes.

A-1173 WIDE-AWAKE SURGERY FOR DUPUYTREN'S DISEASE: CURRENT EVIDENCE ON SAFETY, OUTCOMES AND OUTPATIENT CARE

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Introduction: Dupuytren's contracture is a frequent cause of fixed flexion deformity of the fingers, often requiring surgical intervention when functional limitation progresses. In recent years, wide-awake local anaesthesia no tourniquet (WALANT) has been increasingly applied to Dupuytren procedures, aiming to improve perioperative efficiency and patient experience while maintaining acceptable correction and complication profiles.

Aim: The aim of this work is to summarise the most up-to-date evidence on the role of WALANT in the treatment of Dupuytren's disease, focusing on safety, contracture correction, patient-reported satisfaction and feasibility of outpatient and one-stop pathways. A further objective is to compare WALANT-based approaches with conventional anaesthetic techniques, in order to clarify indications, limitations and potential health-system benefits.

Material & Methods: A narrative literature review was performed, including clinical series, comparative cohort studies and systematic reviews published in the last 10–15 years that reported outcomes of Dupuytren surgery under WALANT or

closely related wide-awake local anaesthetic techniques. Sources were screened for studies describing partial fasciectomy, dermofasciectomy or needle fasciotomy in Dupuytren's disease performed without tourniquet and without routine sedation, as well as broader WALANT hand-surgery programmes that specifically included Dupuytren procedures. Extracted variables comprised type of procedure, anaesthetic protocol, use of intraoperative active-movement testing, complication rates (with emphasis on infection and neurovascular injury), need for unplanned postoperative care, patient satisfaction and models of care such as outpatient or one-stop clinics.

Results: Early descriptions of wide-awake Dupuytren fasciectomy demonstrated that assessment, surgery and discharge could be delivered in a single visit, with high patient acceptance and low complication rates, establishing the feasibility of one-stop clinics. More recent series of wide-awake partial fasciectomy confirm effective correction of contractures with a low incidence of serious adverse events, and most patients reporting they would choose the same anaesthetic method again. Broader WALANT hand-surgery programmes that include Dupuytren cases consistently show low infection rates, minimal requirement for postoperative monitoring and a reduced number of unplanned emergency visits compared with sedated or regionally anaesthetised cohorts. From an organisational perspective, implementing WALANT lists for Dupuytren and other elective hand procedures has been associated with decreased theatre turnaround times, fewer cancellations related to anaesthetic risk and measurable savings in anaesthesia and recovery resources, without evidence of inferior early functional outcomes. Although long-term recurrence after Dupuytren surgery appears to be driven mainly by disease biology and the extent of fascial excision rather than anaesthetic technique, current data do not indicate that the use of WALANT compromises durability of correction when comparable surgical procedures are performed

Conclusions: Available contemporary evidence indicates that WALANT is a safe and effective anaesthetic strategy for surgical treatment of Dupuytren's disease, providing reliable contracture correction with a low rate of major complications and high patient satisfaction. By enabling outpatient and one-stop pathways, reducing dependence on anaesthesia and recovery infrastructure, and maintaining outcomes comparable to traditional techniques, WALANT represents a cost-efficient and patient-centred option that should be considered in routine management of suitable Dupuytren cases.

A-1174 MAGNETIC RESONANCE IMAGING INTERPRETATION OF UPPER LIMB TUMORS: INTEROBSERVER COMPARISON AMONG SPECIALISTS FROM DIFFERENT DISCIPLINES AND AN ARTIFICIAL INTELLIGENCE MODEL (CHATGPT-5)

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Introduction: Magnetic resonance imaging (MRI) is the modality of choice for evaluating musculoskeletal tumors, although its interpretation is often influenced by interobserver variability. The observer's experience and standardized diagnostic criteria are key factors. In recent years, artificial intelligence (AI) has emerged as a potential tool to enhance diagnostic accuracy and reduce interpretation heterogeneity in medical imaging.

Aim: To analyze interobserver variability and diagnostic accuracy in MRI interpretation of upper-limb tumors, comparing the performance of a general orthopaedic surgeon, a musculoskeletal oncology specialist, a radiologist, and an artificial intelligence model (ChatGPT-5), using histopathology as the reference standard.

Material & Methods: A retrospective, observational, cross-sectional study was conducted including 69 patients with upper-limb tumors operated between January 2016 and January 2025 at Sanatorio Allende. Four independent observers (three human and one AI) blindly evaluated MRI images, classifying each lesion as benign or malignant and providing a presumptive diagnosis according to tumor origin. Cohen's κ coefficient was used to assess agreement, and diagnostic accuracy was analyzed against histopathology.

Results: Interobserver agreement with histopathological diagnosis ranged from substantial to almost perfect among human specialists ($\kappa = 0.81\text{--}1.00$), with the musculoskeletal oncology surgeon achieving the highest concordance ($\kappa = 1.00$). The AI model showed lower performance ($\kappa = 0.43$), with limited accuracy in distinguishing benign from malignant lesions. For classification by tumor origin, overall agreement among human observers was substantial ($\kappa = 0.77$), being highest for cartilaginous tumors ($\kappa = 0.90$) and lowest for bone tumors ($\kappa = 0.49$).

Conclusions: MRI interpretation of upper-limb tumors demonstrated high concordance among human specialists, particularly those with oncologic expertise. Although AI represents a promising diagnostic aid, its current performance remains inferior to that of human observers in this setting. Developing AI models specifically trained on musculoskeletal imaging could enhance future diagnostic reliability.

A-1175 TARGETED EVACUATION AND RECONSTRUCTION: A BALANCED APPROACH TO SEVERE LIMB INJURIES

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Introduction: Severe limb injuries present a significant reconstructive challenge due to extensive soft-tissue damage, contamination risk, and frequent fragmentation of early care pathways. Delays in radical debridement and multi-stage transfers between nonspecialized facilities often shift the clinical balance toward avoidable complications and suboptimal functional outcomes.

Aim: To evaluate the concept of Targeted Evacuation as a system-level strategy designed to restore balance in early limb-trauma management through coordinated routing and timely reconstruction.

Material & Methods: A system-based model was implemented in which patients with complex limb injuries were directed immediately to centers capable of integrated ortho-plastic care. The approach emphasized early assessment, decisive debridement, appropriate stabilization, and timely soft-tissue reconstruction performed by a unified team. Process metrics, timing intervals, and clinical outcomes were analyzed in comparison with traditional multi-stage pathways.

Results: Implementation of Targeted Evacuation facilitated consistent management within optimal therapeutic windows. Early debridement and timely soft-tissue coverage reduced infection-related complications, minimized the need for repeated interventions, and improved conditions for definitive reconstruction. The coordinated pathway shifted care from a reactive, fragmented system to a predictable, outcome-driven model.

Conclusions: Targeted Evacuation, combined with early coordinated reconstruction, provides a balanced and scalable framework for managing severe limb injuries. By optimizing timing, streamlining decision-making, and integrating multidisciplinary care, this approach enhances tissue viability, reduces complications, and improves the long-term functional potential of injured limbs.

A-1176 OUTCOME MEASURES FOLLOWING UPPER LIMB AND HAND REPLANTATION

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Introduction: Traumatic limb or hand amputations are severe injuries which affect millions of people worldwide (Yuan et al., 2023). Replantation remains the superior treatment to prosthesis, providing a better quality of life in the longer term (Sabapathy et al., 2007). Nevertheless, there is a wide variability in functional and patient-reported outcomes.

Traditional measures such as range of motion, strength, or sensory recovery capture a limited aspect of the patient's experience after reimplantation. Furthermore, although many studies have examined results following replantation, there is no agreement on which outcome measures should be consistently reported. This lack of standardisation limits comparison across studies and hinders the synthesis of meaningful evidence.

Aim: To provide an up-to-date and comprehensive evaluation of the most used clinical, functional, and patient reported outcome measures in replantation of the upper limb or hand, following traumatic injury.

Material & Methods: A review was conducted in accordance with PRISMA guidelines to identify studies reporting outcomes after major upper-limb replantation. Medline, Embase, and Cochrane CENTRAL were searched for articles from 1995 onward. Each study was screened by two independent reviewers and reported outcome data was extracted and categorised. These were grouped into functional, clinical, patient-reported, and complication-related domains. The frequency of each end point was summarised descriptively.

Results: There was significant heterogeneity in reported outcomes among the 75 included studies. The most commonly reported end points included survival of the replanted limb, power, sensory recovery, and surgical complications. Patient-reported outcomes were sometimes evaluated and were captured using a diverse array of non-standardised instruments. Other outcomes that were reported included the need for secondary procedures, cold intolerance, and chronic pain. Complications such as infection, secondary procedures, and cold intolerance were reported inconsistently. A small number of studies used validated composite scores, such as DASH, Chen's criteria, and Tamai score. In many studies, long-term follow up was insufficient to provide meaningful analysis of outcomes.

Conclusions: Outcome measurement following major upper limb replantation is dominated by simple measures such as survival and basic function. Patient centred metrics, that measure of quality of life, remain underrepresented and lack standardisation. This highlights a need for a core set of outcomes which will facilitate comparability between studies, support meta-analyses, and guide future clinical research.

A-1177 OUTCOMES OF MID-CARPAL WRIST ARTHRODESIS IN CHILDREN WITH SPASTIC WRIST DEFORMITY: A MULTICENTER RETROSPECTIVE COHORT STUDY

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Introduction: Wrist flexion deformity is a common problem in children affected by cerebral palsy. Surgical options usually include a combination of soft-tissue procedures: selective neurectomies tendon lengthening and tendon transfers. In patients with low functional abilities, the deformity often becomes rapidly severe and fixed, interfering with hygiene, nursing, cosmesis and function. Soft tissue procedures are not sufficient at this stage, and wrist arthrodesis may have to be discussed, although theoretically reserved to skeletally mature patients. Mid-carpal wrist arthrodesis has been advocated in arthrogyposis as an alternative to complete fusion, in order to correct the deformity while allowing residual radiocarpal motion.

Aim: To evaluate the clinical and radiological outcomes of mid-carpal arthrodesis in children with spastic wrist deformity, and to assess satisfaction, functional improvements, and complication rates.

Material & Methods: A retrospective review of children who underwent mid-carpal arthrodesis for severe spastic deformity at three centers was performed. Demographic data, diagnosis, goal(s) of surgery (pain, hygiene, function, cosmesis) and preoperative examination including motion, spasticity, contracture and function (House score) were recorded. A

dorsal wedge medio-carpal subtraction osteotomy with K wires fixation was performed in all cases. The outcome study investigated the same elements, as well as radiographic outcome and satisfaction. Complications and reoperations were documented. Statistical analysis included descriptive measures and comparison of pre- and postoperative scores as appropriate.

Results: Twenty five spastic children (27 wrists) who underwent a mid-carpal arthrodesis were included. At a mean follow-up of 34,3 months, significant improvements were observed in the spontaneous position of the wrist (from 74° to 24° of flexion) and in the functional score (from 1.5/8 to 2.8/8). The satisfaction score reached an average of 8.4 /10. Absence of active extension and flexion was observed in respectively 48% and 33% cases before the surgery, without any modification after surgery. When present, active motion was decreased by only 25% on average after surgery, with an average shift of the range of motion of 48° towards extension (from mean 68° of flexion to mean 20° of flexion). Passive motion was decreased by 60% on average, with a similar shift of the range of motion (36°) towards extension. One patient required a total wrist arthrodesis five years later for a recurring wrist flexion deformity. All fusions healed primarily, and no complication was noted. Four patients who improved functionally after surgery underwent a further procedure to improve fingers and thumb motion.

Conclusions: This study suggests that mid-carpal wrist arthrodesis is a valid procedure for the treatment of severe flexion deformities of the wrist in spastic children with non- or poorly functional hands. It spares the growth potential of the wrist, while allowing preservation of some motion.

Keywords: spastic wrist deformity, mid-carpal arthrodesis, cerebral palsy, upper limb surgery,

A-1178 A RETROSPECTIVE COMPARISON OF IM SCREW VS K WIRE FIXATION FOR PHALANGEAL FRACTURES OF THE HAND

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Introduction: Fractures of the phalanges of the fingers are a common injury that is estimated to affect an average of 68/100,000 yearly. Complications following treatment of finger fractures include stiffness and pain, sometimes associated with post-traumatic osteoarthritis. The use of intramedullary fixation of unstable phalangeal fractures employing intramedullary screws is a relatively new concept, and few studies have investigated this technique compared to more traditional methods of osteosynthesis, such as pinning with K-wires.

Aim: This study aims to assess the overall effectiveness and long-term outcomes of patients with IM-screws vs K-wire fixation of phalangeal fractures.

Material & Methods: 46 patients with a phalangeal fracture were treated with the IM screws and K wires during the years 2015–25. 30/46 patients came in for a clinical examination. We administered PRWE, q-DASH, CISS, and EQ-5D at the time of the visit.

Results: No significant differences were found when comparing the TAM on the injured side of patients with fractures fixed with IM-screws and pins. However, when stratifying the two groups by age, a significant difference in TAM was found in the younger patients in the IM group. There was also no significant difference between the groups when examining the prevalence of a TAM greater than 208°. PRWE and Quick-DASH in both groups showed low results with no significant difference between the groups.

Conclusions: Generally, most participants had a functional TAM and a low qDASH score; the participants also reported high satisfaction ratings and low pain ratings.

A-1179 RISING INCIDENCE OF NON-ENDEMIC ENTITIES IN HAND SURGICAL PRACTICE: RAISING AWARENESS ILLUSTRATED BY A CASE REPORT

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Over the past decades, previously 'exotic' diseases have become more common. Additionally, due to medical advancements, people live progressively longer, but also accompanied by progressively more complex pathologies and medications. Due to these developments, hand surgeons might encounter entities, that are not common or expected in their practice. Mycetoma is a chronic granulomatous infection of the skin and subcutaneous tissue characterized by parasitic granules produced by fungal (eumycetoma) or actinomycotic agents. The disease is typically introduced through traumatic inoculation. Hand or finger involvement is rare with rates from 4.6% in the literature. In 2023, the WHO ranked eumycetoma as fungal priority pathogens list to guide the research. The disease is endemic in sub-Saharan Africa, India and parts of South and North America. In Europe, an increasing number of cases have been reported. We want to raise awareness for unexpected entities or pathologies in hand surgery, also in patients who have not directly travelled abroad and have no apparent reason for developing their pathology. We illustrate this using a case report from our practice. A 53-year-old kidney transplant recipient and office worker presented with a rapidly growing, painless mass on the ulnar aspect of the right hand, without trauma or recent travel outside Europe. MRI showed a heterogeneous soft-tissue lesion, and core biopsies were inconclusive. Total excision was performed. Intraoperatively, there was no macroscopic infiltration of nerves, muscle, or bone. Histopathology and fungal culture confirmed a fungal infection, although species identification was initially not conclusive. Despite systemic antifungal therapy, the lesion recurred one year after the excision. A subsequent biopsy identified *Scopulariopsis* spp. (*Microascus cinereus*). Antifungal therapy with isavuconazole was initiated but showed no improvement, with progression of the mass. The recurrence was exacerbated massively after the patient underwent a second kidney transplantation due to failing of his first kidney, which lead to the need of hemodialysis. Eleven months after the first surgery, and three months after the successful second kidney transplant, a second radical excision of the mycetoma was performed with defect coverage using a pedicled reverse ulnar artery perforator flap. Due to nerve infiltration, an end-to-side anastomosis of N10 to N9 and repair of the N9–10 common fascicle was performed. Postoperatively, the patient continued isavuconazole therapy for an additional three months. At eight months of follow-up, there is no clinical or MRI evidence of recurrence. The patient reports normal hand function, a full range of motion, and grip strength comparable to the contralateral side, without major complications. Sensibility of N10 is progressing with a positive Tinel sign along the nerve. Due to development in medical treatments and rapid spread of non-endemic entities of all sorts and forms due to migration, more atypical pathologies are to be expected. Awareness of atypical presentations of fungal or bacterial entities in non-endemic regions is essential for early diagnosis and timely management to prevent disease progression and preserve hand function. An interdisciplinary approach to diagnosis is essential. In our case, combining systemic antifungal therapy with radical surgical excision can lead to favorable outcomes.

A-1180 IS US-GUIDED CTR SAFE IN CASES OF ANATOMICAL VARIANTS? MY EXPERIENCE WITH OCTR AND ECTR

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Introduction: open carpal tunnel release (OCTR) has been performed successfully for many years with a trend, however, toward less-invasive procedures. Over the recent years the safety and efficacy of minimally invasive procedures i.e.

endoscopic carpal tunnel release (ECTR) and real-time ultrasound-guided (USG) have been demonstrated, leading to a lower invasiveness, less tissue trauma and a lower rate of procedural complications. By the way damage to the recurrent branch of the median nerve (RMB) may lead to severely impaired function in patients, with loss of dexterity, pinch and grasp function. The main clinical relevance of the RMB is its susceptibility to iatrogenic injury, due to its variants, during decompression surgery for carpal tunnel syndrome.

Aim: we hypothesized that the RMB is at risk during routine US-guided analysing the data of RMB variants encountered during OCTR and ECTR procedures.

Material & Methods: data of the operative records from 2100 hands of individuals who had been diagnosed with CTS and undergone OCTR or 2-portal ECTR were examined. In case of appearance of an anatomical variant this was classified according to Lanz's classification.

Results: the most frequent anatomical variant was extraligamentous (type 1A). In all cases of RMB transligamentous (type 1B) or crossing from the ulnar border (type 1D) variants the severance of that branch would have been inevitable in case of US-guided procedure. One case of immediate repair after hyatrogenic injury of a type 1D RMB was reported and led to a complete recovery at 2-year follow-up.

Conclusions: variants of the RMB are rare but potentially risky in cases of US-guided CTR.

In case of choice of a mini-invasive surgery pros and versus should be balanced and discussed extensively to prevent litigations and permanent lesions.

A-1181 USING AXILLARY APPROACH FOR LENGTHENING PECTORALIS MAJOR AND THE CONJOINT TENDON IN A PATIENT WITH SPASTICITY

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Introduction: Shoulder contractures in patients with spasticity can significantly limit upper limb function and restrict hygiene as it becomes difficult for patients to wash their affected armpit. The senior author shares his experience of using an axillary approach to lengthen the conjoint tendon and pectoralis major to ease contracture and aid function.

Aim: This study highlights our experience of using a new approach that gives good cosmetic results as well as allowing sufficient access to anatomical structures.

Methods and Materials: Zur patient was a 56-year-old lady who had suffered a traumatic brain injury one year ago. This had left her with increased tone in her left arm which had previously been treated with physiotherapy and botox. She had no pain and normal sensation. She had a history of well controlled epilepsy and had undergone an FCU to EDC transfer in 1989. She at the shoulder she had -10 degrees external rotation, 80-degree abduction, full passive forward flexion but limited in active flexion and internal rotation to facilitate forward flexion. At the elbow she had full flexion, -10 degrees extension. At the wrist she had full extension and 20 degrees flexion. At the fingers she had full flexion with the wrist extended and full extension with the wrist flexed. At the thumb she had reduced webspace with increased tone in Flexor Pollicis Brevis and Adductor, but not Flexor Pollicis Longus.

Results: The patient underwent a lengthening of the conjoint tendon and pectoralis major through an axillary approach. Previous cadaveric studies were used to help plan surgery and facilitate identification of landmarks, nerves and vessels as well as the tendomuscular anatomy 1,2,3. An incision was made in the axilla. Tissue planes were dissected to identify Pectoralis Major, Conjoined tendon, Axillary Nerve, Lower subscapular nerve, Nerve to Latissimus Dorsi, Thoracodorsal vessels and Latissimus dorsi.

The sternal head of pectoralis major was lengthened. The musculocutaneous nerve was mobilised to lengthen the conjoint tendon safely.

Conclusion: The wound healed well. There were no reported wound complications, and the scar was in an unobtrusive area. The patient felt that the shoulder was more relaxed and less stiff although the range of movements was largely the same. She reported that it was easier to wash herself and overall function of her upper limb was better as her shoulder felt less stiff.

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A-1182 FIXATION OF OLECRANON FRACTURES USING HIGH-STRENGTH SUTURE WIRE WITH CERCLAGE AND TRANSOSSEOUS SUTURES: TECHNIQUE DESCRIPTION AND PRELIMINARY OUTCOMES

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Introduction and aim: Traditional techniques used for the fixation of displaced olecranon fractures, such as metallic tension-band wiring and dorsal locking plate osteosynthesis, provide stable fixation but are associated with substantial rates of hardware irritation, reoperations, and other implant-related complications. In recent years, the use of high-strength sutures has enabled the development of alternatives with reduced morbidity and comparable biomechanical stability. Based on the tension-band principle, we present a technique that combines a cerclage system configured as an “figure-of-eight” construct and a set of transosseous tunnels connected using high-strength sutures, achieving a robust internal and external fixation construct without the need for metallic implants. The aim of this study is to describe this surgical technique for olecranon fractures, and analyze the preliminary clinical outcomes obtained in our initial patient series.

Material & Methods: In 2025, four patients with displaced olecranon fractures (Mayo type IIA) were treated using the described technique. The procedure consisted of creation of a distal transverse hole for the cerclage and two transosseous tunnels on either side of the fracture using K-wires; passage of two FiberTape sutures (Arthrex) through the tunnels and two additional sutures through the triceps in opposite directions; and sequential knotting of the transosseous sutures, the transtricipital cerclage sutures, and the two systems together, generating three interconnected constructs that provided compression and stability across the fracture site. Postoperative follow-up was performed at 6 weeks, 12 weeks, and 6 months, assessing elbow range of motion in flexion and extension, pain using the VAS scale, functional outcomes using the QuickDASH and Mayo Elbow Performance Score (MEPS), and radiological parameters including fracture gap, articular step-off, and the olecranon-to-trochlear width/height ratio.

Results and discussion: Three patients achieved radiographic union without loss of reduction or need for reoperation, while one patient sustained a secondary loss of reduction. At six months, all patients showed clinically significant improvement in functional parameters, including flexion–extension arc, VAS pain scores, QuickDASH values, and MEPS. No additional complications such as infection or symptomatic soft-tissue irritation were observed. Our findings are consistent with

those reported in the literature regarding the potential of metal-free fixation techniques to reduce morbidity and implant-related complications without compromising stability in olecranon fractures. Although numerous studies describe suture-based fixation, there is a relative paucity of reports combining transosseous tunnel configurations with suture cerclage constructs. The integration of these systems enhances stability and permits controlled early mobilization, which is especially important for preventing elbow stiffness. Our preliminary outcomes demonstrate satisfactory function, reliable fracture healing, and absence of reinterventions in most cases.

Conclusions: The described construct, combining suture cerclage with high-strength transosseous sutures, may represent a stable, reproducible, and low-complication alternative for the treatment of displaced olecranon fractures. Larger series and comparative studies are required to confirm its reproducibility, biomechanical soundness, and efficacy relative to conventional fixation methods such as locking plates and metallic tension-band wiring.

A-1183 EXTERNAL DISTRACTION DEVICES WITH FASCIECTOMY VS. FASCIECTOMY ALONE FOR SEVERE DUPUYTREN'S CONTRACTURE: A MATCHED COHORT STUDY OF SURGICAL AND FUNCTIONAL OUTCOMES

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Introduction: Severe or recurrent Dupuytren's contracture can limit hand function and complicate surgical correction. External distraction devices have been used to gradually lengthen contracted palmar tissues prior to fasciectomy, with the aim of improving soft-tissue compliance and reducing neurovascular risk. Comparative data evaluating staged distraction followed by fasciectomy versus fasciectomy alone remain limited, particularly regarding joint-specific outcomes.

Aim: To compare postoperative contracture angles and improvement in the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints between patients treated with staged distraction followed by fasciectomy and those treated with fasciectomy alone.

Material and Methods: A retrospective cohort of patients undergoing operative treatment for Dupuytren's contracture at a single institution was reviewed. Two groups were identified: fasciectomy alone (control) and staged distraction prior to fasciectomy (distraction cohort). Joint-specific MCP and PIP angles were extracted from clinical documentation using a standardized text-parsing workflow. Preoperative angle, postoperative angle, and improvement (preoperative minus postoperative) were calculated. A total of 36 MCP joints (control 19, distraction 17) and 51 PIP joints (control 25, distraction 26) had complete preoperative angle documentation; 44 MCP joints (control 26, distraction 18) and 82 PIP joints (control 33, distraction 49) had postoperative angles available. Continuous variables were compared using independent-samples tests with a significance threshold of 0.05.

Results: Preoperative MCP contracture was similar between groups (mean 39.8 degrees in both cohorts). Postoperative MCP contracture trended lower in the distraction cohort (-1.9 degrees) compared with controls (5.8 degrees), and MCP improvement was greater (44.6 degrees versus 30.9 degrees), although neither difference reached statistical significance. For the PIP joint, the distraction cohort presented with greater preoperative deformity (60.9 degrees versus 45.0 degrees; $p = 0.15$). Postoperative PIP contracture remained higher in the distraction cohort (20.9 degrees versus 13.6 degrees; $p = 0.22$). Overall PIP improvement was comparable between groups (45.3 degrees versus 38.4 degrees; $p = 0.62$).

Across MCP and PIP joints, staged distraction followed by fasciectomy produced improvements similar to fasciectomy alone despite more severe preoperative deformity in the distraction cohort. Final PIP contracture was numerically higher after staged distraction, although variability and sample size limited statistical significance.

A-1184 POST-FASCIOTOMY COMPLICATIONS IN UPPER EXTREMITY COMPARTMENT SYNDROME: A SYSTEMATIC REVIEW, PROPORTIONAL META-ANALYSIS, AND REGRESSION OF INDIVIDUAL PATIENT DATA

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Introduction / Aim: Acute compartment syndrome of the upper extremity threatens the perfusion–pressure equilibrium essential for coordinated hand and forearm function. When decompression is delayed, ischaemia disrupts neuromuscular integrity and may lead to stiffness, persistent deficit, or limb loss. Despite its importance, predictors of post-fasciotomy outcomes are insufficiently defined. This study aimed to establish benchmark prevalence rates for adverse outcomes and to identify demographic, injury-related, and treatment-related predictors influencing recovery following decompression. **Materials & Methods:** A protocol-driven systematic review and meta-analysis was performed in accordance with PRISMA guidance. Searches of Medline, Embase, SCOPUS, CINAHL and the Cochrane Library (inception to 12 June 2024) identified observational studies reporting upper extremity acute compartment syndrome (UECS) outcomes. Risk of bias was assessed using Joanna Briggs Institute and NIH tools; evidence certainty was appraised with GRADE. Random-effects proportional meta-analysis (Freeman–Tukey transformation) generated pooled prevalence estimates. Two-step random-effects logistic regression modelled predictors of adverse outcomes. Individual patient data from eight studies were incorporated into a hierarchical logistic model, enabling age-stratified analysis of time-to-fasciotomy (TTF) and mechanism of injury.

Results: Twelve studies comprising 4,093 patients met inclusion criteria. Pooled prevalence was 17% for sensory deficit, 20% for motor deficit, 11% for stiffness, 4.1% for amputation, and 1.9% for mortality. Delayed decompression was the strongest predictor of adverse outcome. Fasciotomy performed 6–12 hours after injury significantly increased the odds of neuromuscular sequelae (OR 3.93, 95% CI 1.56–8.32) and all complications (OR 4.01, 95% CI 1.44–11.13). Delays of 12–24 hours produced similar increases (OR 4.32 for neuromuscular sequelae; OR 3.48 for all complications). Decompression beyond 24 hours raised the odds of neuromuscular sequelae more than fivefold (OR 5.50, 95% CI 2.10–12.47). Each additional year of age increased adjusted complication odds by approximately 2%. Infection markedly increased the likelihood of neuromuscular sequelae (OR 5.73) and overall complications (OR 12.24). High-energy blunt trauma significantly increased complication risk (OR 3.36). Subgroup analysis revealed a clear distinction between adults and children. Adults experienced sharply increased morbidity with delays beyond 6 hours (ORs 8.76 and 10.91 for 6–12 hours and >24 hours, respectively). In paediatric cases, delayed decompression did not significantly worsen outcomes, reflecting relative physiological resilience. **Conclusions:** This review establishes contemporary prevalence benchmarks for post-fasciotomy outcomes in UECS and identifies key predictors of poor recovery. Timely fasciotomy is crucial in adults, for whom delays beyond 6 hours significantly increase the risk of neuromuscular and overall complications. Age, infection, and high-energy trauma further modify risk. In contrast, delayed fasciotomy may remain beneficial in paediatric patients without the same degree of harm. These findings support targeted strategies to preserve functional equilibrium in the upper limb, including prioritising local care pathways, expanding fasciotomy competence amongst general surgeons, and employing telemedicine-supported decision-making in non-specialist settings.

A-1185 THE TPO-REGISTRY: A MULTICENTER PROSPECTIVE REGISTRY FOR OUTCOMES OF THUMB CMC1 PROSTHESES IN THE TREATMENT OF RHIZARTHROSIS

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Introduction: Rhizarthrosis of the thumb saddle joint is a common degenerative disease associated with pain, loss of strength, and functional limitations. Despite the widespread use of the TOUCH® prosthesis, there is currently a lack of independent, standardized data on clinical outcomes, complication rates, and patient satisfaction.

Aim: The TOUCH® Prosthesis Outcome Registry (TPO-Registry) was initiated to prospectively and multicentrically collect clinical, radiological, and patient-reported parameters for primary implantation of a TOUCH® prosthesis. The aim is to continuously improve the quality of care and to provide a reliable data basis for scientific evaluations and guideline development.

Material & Methods: The registry is non-interventional and uses a web-based REDCap platform from Charité for standardized data collection. Basic demographic data, preoperative findings, intraoperative details, radiological image data, and validated PROMs (e.g., Brief Michigan Hand Questionnaire, TDX-G) are documented. Follow-up examinations take place after 6 weeks, 6 months, 1, 2, 5, and 10 years. Data protection and quality assurance are guaranteed by an established concept. The project has been approved by the Ethics Committee of Charité – Universitätsmedizin Berlin.

Results: The registry is currently in the pilot phase at the first cooperation sites. The rollout to other centers is planned for mid-2026, so that new partners can be immediately integrated into the national data collection. Participating clinics receive an annual report and real-time insights via a dashboard and can use their key figures for internal analysis. The TPO registry creates the first standardized, reliable data basis for the provision of TOUCH® prostheses in Germany and invites interested centers to actively contribute to optimizing the treatment of patients with rhizarthrosis.

A-1186 A BALANCED REHABILITATION FOLLOWING GREAT TOE-TO-THUMB TRANSFER: LITERATURE REVIEW AND CLINICAL INSIGHTS

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Introduction: Thumb amputation profoundly disrupts hand function, compromising pinch, grip, dexterity, and overall upper-limb balance. Microsurgical reconstruction using great toe transfer is a well-established treatment strategy to restore thumb length, stability, and opposition when replantation is not possible. While surgical techniques are well described, postoperative rehabilitation is equally crucial for re-establishing functional balance between the reconstructed thumb and the remaining hand segments. Effective rehabilitation must integrate biomechanical, sensory, and motor components to harmonise the new thumb within the hand's functional system. Despite its importance, standardised postoperative protocols and outcome analyses remain limited.

Aim: This presentation aims to summarise and illustrate an acute postoperative rehabilitation programme for hand therapy following great toe-to-thumb transfer in adult patients. We will present a detailed rehabilitation programme that integrates both the current evidence base and our clinical experience.

Materials and methods: We conducted a literature search across multiple databases, using the keywords “toe-to-thumb

transfer rehabilitation". Articles were excluded if the study population consisted of children, if the transfer involved a finger rather than the thumb, or if other surgical procedures were carried out on the operated hand. The selected articles were required to address rehabilitation, functional recovery after surgery, and outcome measures. All articles focusing on rehabilitation after a toe-to-hand transfer in adults were included. In addition, we included case reports that we personally managed within our teams, which helped to enhance understanding of the actual rehabilitation process in hand therapy. Results: Most published studies focus primarily on surgical outcomes, while postoperative rehabilitation is only minimally described. The limited rehabilitation literature predominantly addresses sensory re-education, without describing the full postoperative programme. In this section, rehabilitation strategies are summarised based on the available literature and complemented by our clinical experience as hand therapists. We do not intend to provide therapeutic guidelines. The primary objective of rehabilitation is to achieve an optimal balance between initiating early therapy and adequately protecting the reconstructed thumb to minimise the risk of necrosis. The treatment plan must be individually tailored, aligned with the surgical procedure performed, and adjusted according to each phase of healing. Close communication and approval from the surgeon remain essential. Early rehabilitation begins once the highest risk of necrosis has passed. It starts with wound care, splinting, mobilisation, and oedema management. Equal attention must be given to the donor site. Sensory re-education should begin early with sensory relearning and then progress once the patient can perceive sensation. The second rehabilitation phase begins when the reconstructed thumb becomes anatomically stable, typically around two months postoperatively. At this stage, dexterity training, strengthening, and functional activities can be introduced. When a rehabilitation programme is appropriately tailored and patient adherence is high, they can regain a level of functional balance within the hand that would have been unthinkable 60 years ago.

A-1187 MORTALITY FOLLOWING DISTAL RADIAL FRACTURES IN OLDER ADULTS: A SYSTEMATIC REVIEW AND POOLED ANALYSIS OF OBSERVATIONAL STUDIES

Celeste Chan Li-Lynn¹, Mala Satku²

¹Department of Hand and Reconstructive Microsurgery, National University Hospital, Singapore; ²Department of Hand and Reconstructive Microsurgery, Tan Tock Seng Hospital, Singapore

Introduction: Distal radius fractures (DRFs) are the most common fragility fractures in adults aged 50 years and older and are frequently associated with osteoporosis and age-related frailty. Although often perceived as low-risk upper limb injuries, DRFs increasingly appear to reflect broader systemic vulnerability. Several observational studies have suggested an association between DRFs and subsequent mortality, but reported estimates vary widely and remain incompletely defined. **Aim:** The objective of this study is to estimate pooled one-year and five-year mortality rates following distal radius fractures in adults aged ≥ 50 years, and to identify demographic and clinical factors associated with increased mortality. **Material & Methods:** A systematic review and pooled analysis was performed in accordance with PRISMA guidelines. PubMed, Scopus, the Cochrane Library, CINAHL, and Web of Science were searched from inception to June 2025 for English-language observational studies reporting one-year or five-year mortality after distal radius fractures. We included studies that involved adults aged ≥ 50 years and reported mortality as a primary or secondary outcome. Random-effects modelling was used to generate pooled estimates. Between-study heterogeneity was assessed using the I^2 statistic. Funnel plots and Egger's regression test were used to explore potential small-study effects.

Results: A total of nine studies (418,221 patients) contributed to the pooled one-year mortality estimate. The pooled one-year mortality rate was 3% (95% CI, 2–4%), with substantial heterogeneity observed across studies ($I^2 = 99\%$). Eight studies, including 393,844 patients, reported five-year outcomes, yielding a pooled five-year mortality rate of 10% (95% CI,

4–23%) ($I^2 = 100\%$). Mortality was consistently higher in men despite a lower overall incidence of distal radius fractures. Increasing age, osteoporosis, and greater comorbidity burden were commonly associated with higher mortality. Egger's regression tests were not statistically significant for either the one-year ($p = 0.4741$) or five-year ($p = 0.5013$) analyses. In adults aged 50 years and older, distal radius fractures are associated with an increased mortality risk. DRFs appear to function as early indicators of underlying frailty, particularly in men and in patients with significant comorbidities. These findings support viewing DRFs as potential entry points into fragility-fracture care pathways, prompting systematic assessment for osteoporosis and broader health risks rather than isolated fracture management.

A-1188 THE EFFECTIVENESS OF DELAYED SURGICAL TREATMENT IN PATIENTS WITH CHRONIC CARPAL TUNNEL SYNDROME

Marta Twardowska¹, Piotr Czarnecki¹, Marta Jokiel¹, Ewa Bręborowicz¹, Juliusz Huber², Leszek Romanowski¹

¹*Department of Traumatology, Orthopaedics and Hand Surgery, Poznań University of Medical Sciences, Poland;* ²*Department of Pathophysiology of Locomotor Organs, Poznań University of Medical Sciences, Poland*

Carpal tunnel syndrome (CTS) is the most common compression neuropathy in upper extremities treated both conservatively and surgically when advanced. The most prevalent symptoms include hand numbness; thumb, index, and long finger sensation loss; and thenar muscle strength loss resulting in impaired daily functioning for patients. There is scarce data on the results of CTS treatment in patients with delayed surgical intervention. The aim of this study was to determine the postoperative results of chronic carpal tunnel syndrome treatment in patients for whom the symptoms have lasted for at least 5 years.

A total of 86 patients (69 females, 17 males) with a mean age of 58 years reporting symptoms of CTS for at least 5 years (mean 8.5 years) were recruited for this study. The average follow-up time was 33 months. All patients underwent open decompression of the median nerve to treat carpal tunnel syndrome. The prospective study included two stages. The first involved a preoperative examination composed of an interview and clinical examination. Global grip strength, sensory discrimination, and the presence of characteristic symptoms and thenar muscles atrophy were examined. Subsequently, the subjects completed the DASH (The Disabilities of the Arm, Shoulder and Hand), PRWE (Patient-Rated Wrist Evaluation), and self-report questionnaires. During the second stage, all the examinations were repeated, and patients expressed their opinions by completing a BCTQ (Boston Carpal Tunnel Syndrome Questionnaire) questionnaire. Postoperatively patients exhibited significant improvements in daily activities and hand function. 88% of patients were satisfied with the outcome of surgery. Significantly lower DASH questionnaire scores were observed in patients after surgery compared with patients before surgery ($p < 0.001$). DASH scores decreased from 44.82 to 14.12. PRWE questionnaire scores significantly decreased from 53.34 to 15.19 ($p < 0.001$). The mean score of the BCTQ for all subjects on the scale regarding the severity of symptoms was 1.48 after surgery, and on the scale regarding function, it was 1.62. No significant differences were found in the scores between the male and female groups or between age groups ($p > 0.05$). A significant increase in global grip strength from 16.61 kg to 21.91 kg was also observed ($p < 0.001$). No significant difference was detected in the measurement of sensory discrimination before surgery, patients had a score at 6.02 51 mm, whereas after surgery the score was at 5.44. In most of examined patients, night numbness and wrist pain subsided after surgery, and strength in the hand also improved. Thenar muscle atrophy diminished after surgery. Most patients were satisfied with the results of CTS surgery regarding the open decompression of the median nerve even after five years of ineffective conservative treatment. Significant improvement of the hand function was confirmed in the functional studies.

A-1189 INTRODUCTION: MIKKO RÄISÄNEN

Finland

A-1190 WHAT IS THE ROLE AND HOW MUCH AI CAN HELP US IN DIAGNOSTICS OF ULNAR ABUTMENT?

Turkka Anttila

Finland

A-1191 ARTHROSCOPIC WAFER PROCEDURE: OPTIMIZING RESULTS USING DRUJ PORTALS

Mikko Räisänen

Finland

A-1192 ULNAR SHORTENING OSTEOTOMY STILL WINNER'S CHOICE!

Heidi Vastamäki

Finland

A-1193 CASE PRESENTATION

Mikko Räisänen

Finland

A-1194 CASE PRESENTATION

Heidi Vastamäki

Finland

A-1195 CASE PRESENTATION

Turkka Anttila

Finland

A-1196 CASE PRESENTATION

Robert Gvozdenovic

Denmark

A-1197 CASE PRESENTATION

Maria Wilcke

Sweden

A-1198 CASE PRESENTATION

Kristo Kask

Estonia

A-1199 CASE PRESENTATION

Sondre Hassellund

Norway

A-1201 WHAT IS NEUROPATHIC PAIN AND PRINCIPLES TO UNDERSTAND

Rosa Morro

Spain

A-1202 NEW NERVE CONDUCTION STUDIES FOR PAIN

Janina Turon

Spain

A-1203 MANAGEMENT OF IRRITATIVE NERVE PAIN

Francisco del Piñal

Spain

A-1205 TERMINAL NEUROMAS AND NEUROMAS IN CONTINUITY

Joaquim Casañas

Spain

A-1206 NON-SURGICAL MANAGEMENT OF NEUROPATHIC PAIN

Victor Mayoral (anesthesia)

Spain

A-1207 REHAB IN SEVERE CASES

Vicenç Punsola Izard

Spain

A-1208 CASES AND SOLUTIONS

all

Spain

A-1209 INTRODUCTION SLIDING, GLIDING OR ENTRAPPED: RESTORING BALANCE FOR UPPER EXTREMITY NERVES

Sarah Ewald

Switzerland

A-1210 SEEING IS BELIEVING: ULTRASOUND AND PERIPHERAL NERVES FROM A HAND THERAPIST'S PERSPECTIVE

Tom Lattré

Belgium

A-1211 SIMPLIFYING THE DIAGNOSIS OF MEDIAN AND ULNAR NERVE COMPRESSIONS

Elisabet Hagert

Qatar

A-1212 THE FORGOTTEN RADIAL NERVE: COMPRESSION AND PAIN

Alison Taylor

USA

A-1213 MUSCULAR BALANCE OF FORCES ACTING ON THE HAND, THEORICAL AND CLINICAL ASPECTS

Michel Boutan

France

A-1214 PRIORITIZE PROXIMAL INTERPHALANGEAL JOINT EXTENSION, A CADAVER STUDY CLARIFYING PIPJ NEUTRAL POSITION AND JOINT CAPSULAR BEHAVIOR

Vicenç Punsola Izard

Spain

A-1215 THE FINGER: RESTORING BALANCE IN DORSAL APPARATUS AFTER INJURY

Silvio Tocco

Italy

A-1217 THE HAND SURGEON'S PERSPECTIVE: SETTING THE STAGE FOR SCAR MANAGEMENT

Olga Politikou

Switzerland

A-1218 BEYOND TECHNIQUES: EVIDENCE-BASED DECISION-MAKING IN SCAR THERAPY

Tanya Schuhmacher

Switzerland

A-1219 RESTORING TISSUE BALANCE: FASCIAL AND MANUAL APPROACHES IN SCAR MANAGEMENT

Alison Taylor

USA

A-1220 BALANCING PRIORITIES: INTEGRATING EVIDENCE, EXPERTISE, AND PATIENT GOALS IN SCAR MANAGEMENT

Angeliki Vervainioti

Iceland

A-1221 SMALL ACTIVITIES, BIG IMPACT: TACKLING EMOTIONAL PAIN IN UPPER EXTREMITY REHABILITATION

Barbara Aegler

Switzerland

A-1222 FROM FRAGILITY TO ANTIFRAGILITY: AN EMBODIED APPROACH TO RECOVERY IN HAND THERAPY

Martina Egan Moog

Australia

A-1223 SCIENTIFIC QUALITY, LEVEL OF EVIDENCE, AND FAKE NEWS: ASSESSING VALUE OF RESEARCH PAPERS

Ruud Selles

The Netherlands

A-1224 BEYOND RANDOMIZATION: CHOOSING THE RIGHT STUDY DESIGN FOR THE RIGHT QUESTION

Robbert Wouters

The Netherlands

A-1225 INVOLVING PATIENTS IN RESEARCH

Eva Segelov

Switzerland

A-1226 BRIDGING EVIDENCE AND EXPERIENCE: QUALITATIVE RESEARCH IN HAND THERAPY

Lisa Newington

United Kingdom

A-1227 BRILLIANT IDEAS, FAILED STUDIES? WHY FEASIBILITY ANALYSIS IS THE FOUNDATION OF SUCCESSFUL HAND THERAPY RESEARCH

Miriam Marks

Switzerland

A-1228 LESSONS LEARNED: BARRIERS TO CLINICAL RESEARCH & SOLUTIONS

Elske Bonhof, Tanja Oud

The Netherlands

A-1229 HOW TO UNDERSTAND AND MANAGE IMPLEMENTATION: AN IMPLEMENTATION SCIENTISTS TOOLKIT

Nathan Stephens

Switzerland

A-1230 BIOMECHANICAL FAILURE IN THE RHEUMATOID HAND AND THE ROLE OF TARGETED ORTHOTIC INTERVENTION

Nathalie Schelpe, Vanja Dewaele

Belgium

Rheumatoid arthritis profoundly alters the biomechanical balance of the hand through chronic synovitis, ligamentous laxity, tendon imbalance and progressive joint destruction. At the level of the hand, this leads to a spectrum of characteristic

deformities — including ulnar drift, swan-neck and boutonnière deformities, MCP subluxation and thumb instability — reflecting a shared underlying biomechanical failure. These changes result in loss of joint congruency, altered force transmission, and reduced grip and pinch efficiency during functional activities.

This presentation explores the biomechanical mechanisms underlying these changes and demonstrates how targeted orthotic interventions can address key points of mechanical failure. Rather than immobilization, modern hand splinting in rheumatoid arthritis aims to restore dynamic balance, optimize force transmission and support joint stability while preserving mobility. Specific attention will be given to the complementary role of night splinting in maintaining joint alignment and reducing cumulative mechanical stress over prolonged periods of rest. Through clinical examples, we will illustrate how a biomechanical understanding of the rheumatoid hand directly informs splint design and selection, facilitating more efficient functional use of the hand in daily life.

A-1231 OVERVIEW OF POSSIBLE SURGICAL INTERVENTIONS IN RHEUMATIC HANDS

HP van Not

Zeeuws Hand en Pols Centrum, The Netherlands

As a hand surgeon trained in reumatoid surgery in the 90's I have seen the treatment of patients with reumatoid disease change dramatically. Medication really changed the severity of deformities and totally changed our surgical practice.

However not all the patients benefit as much of the new and still improving farmaceutical possibilities. Both in the adult as in juvenile population of our practice we still encounter severe deformities who benifit from extensive surgical treatment.

We have always treated our patients within a team of specialists comprising a specialist in reumatology and rehabilitation.

In a combined out patient clinic together with our handtherapists we discuss the surgical and medication options and timing. We routinely do pre-and post-op measurements during the full rehabilitation process.

As a team we learned from each others speciality, and improved our understanding of the needs of the individual patient.

Our data helped to decide what to do and we could educate the patient on the expected rehabilitation time and necessary support.

Our latest generation of handsurgeons is sure to have less exposure and thus experience with reumatoid surgery and securing knowledge in this field is an important factor in securing good multidisciplinary treatment of the reumatoid patient for the future.

A-1232 ANATOMY OF THE FLEXOR TENDON WITH CADAVER DISSECTION IMAGES

Miryam Obdeijn

The Netherlands

A-1233 FLEXOR TENDON REPAIR: SURGICAL INSIGHTS AND KEY CONSIDERATIONS FOR THERAPISTS

Florian Früh

Switzerland

A-1234 RECENT ADVANCES IN FLEXOR TENDON INJURIES AND OUTCOME FACTORS

Marjolein Wind

The Netherlands

A-1235 RESULTS OF THE FIRST TRIAL (FLEXOR INJURY REHABILITATION SPLINTS)

Emma Bamford

UK

A-1236 SHORT SPLINT VERSUS RELATIVE MOTION FLEXION: WHICH ONE LEADS TO HIGHER PATIENT SATISFACTION

Tamara Hauri

Switzerland

A-1237 THE FLARE STUDY: ZONE 2 FLEXOR TENDON REPAIR AND THERAPIST-LED REHAB

Emma Reay

UK

A-1238 OPTIMIZING FLEXOR TENDON HEALING: SURGERY AND REHAB STRATEGIES

Rossella Pagliaro

Italy

A-1239 FROM PLASTIC TO PATIENT: 3D PRINTING CUSTOM SOLUTIONS IN HAND THERAPY

Frédéric Schuind

Belgium

A-1240 BRIDGING THE GAP: INTEGRATING 3D PRINTING INTO CLINICAL HAND REHABILITATION

Fabio Spallanzani

Italy

A-1241 THERE'S AN APP FOR THAT: HARNESSING DIGITAL TOOLS FOR PATIENT ENGAGEMENT

Alejandro Suero-Pineda

Spain

A-1242 BRINGING TECHNOLOGY TO THE CLINIC: OPPORTUNITIES AND BARRIERS

Francesca Ferrario

Switzerland

A-1243 THE FUNDAMENTALS OF PHYSIOLOGY – GUIDING THROUGH REHABILITATION

Pascale GränicHER

Switzerland

A-1244 PROPRICEPTION - FOUNDATION FOR EVERYTHING AROUND SPORTS

Elisabet Hagert

Qatar

A-1245 MOST COMMON ROCK CLIMBING INJURIES: TREATMENT AND REHABILITATION

Andreas Schweizer

Switzerland

A-1246 THE GYMNAST'S WRIST: FROM INJURY TO RETURN TO SPORT

Tom Lattrè

Belgium

A-1247 HORMONES: EXPLORING THE HIDDEN DIRECTORS OF OUR ACTIONS

Barbara Aegler

Switzerland

A-1249 THE HORMONAL SIDE OF ACTIVITY: EXPLORING CORTISOL AND OXYTOCIN

Céline Delmée

Switzerland

A-1250 DUPUYTREN'S DISEASE: RELEVANT ASPECTS OF SURGICAL TREATMENT FOR HAND THERAPISTS

Paul M.N. Werker

The Netherlands

A-1251 SPLINTING - A BALANCING ACT IN DUPUYTREN'S DISEASE

Sonja E. Pelzmann

Austria

A-1252 MEASURING WHAT MATTERS: PRACTICAL OUTCOME TOOLS IN DUPUYTREN'S HAND THERAPY

Elena Lanfranchi

Italy

A-1253 EFFECTS OF POSTOPERATIVE HAND THERAPY IN PATIENTS WITH DUPUYTREN'S DISEASE: A PROSPECTIVE HYPERSPECTRAL IMAGING STUDY

Inga Langner

Germany

A-1254 SHARED DECISION MAKING AND DECISION COACHING

Susanne Boel

Denmark

A-1255 ETHICAL CONSIDERATIONS IN SHARED DECISION-MAKING AND THE USE OF CLINICAL DECISION SUPPORT TOOLS

Danée Langeslag-Arends

the Netherlands

A-1256 DEVELOPMENT OF A DECISION SUPPORT TOOL FLEXOR TENDON REPAIRS

Emma Bamford

UK

A-1257 DATA-DRIVEN DECISION SUPPORT FOR SHARED CLINICAL DECISIONS

Robbert Wouters

the Netherlands

A-1258 THE INFLUENCE OF PLACEBO, NOCEBO EFFECTS AND CONTEXTUAL FACTORS IN MUSCULOSKELETAL REHABILITATION

Giacomo Rossetini

Italy

A-1259 CASE ILLUSTRATIONS: HOW ILLNESS BELIEFS SHAPE RECOVERY

Nienke Meinema-Sanders

The Netherlands

A-1260 APPLYING PSYCHOLOGICAL PRINCIPLES FROM ECONOMICS TO HAND THERAPY: HOW DO COGNITIVE PROCESSES INFLUENCE OUR CLINICAL DECISIONS?

Giovanni Leone

Switzerland

A-1261 OPTIMIZING MINDSET AND EXPECTATIONS IN CLINICAL HAND & WRIST CARE

Gilbert-Jan van Gaalen

the Netherlands

A-1262 "...BUT IF YOU TREAT THE PERSON YOU WIN, NO MATTER WHAT THE OUTCOME. PATCH ADAMS"

Elena Verderi

Italy

A-1263 HOW A SIMPLE TATTOO TABLE HAS IMPROVED MY COMMUNICATION WITH MY PATIENT

Mireia Esplugas

Spain

A-1264 SHORT UPDATE ON EVIDENCE FOR OCCUPATION-BASED INTERVENTIONS

Karin Boer

The Netherlands

A-1265 WHAT DOES OCCUPATION-CENTRED HAND THERAPY LOOK LIKE? INSIGHTS FROM A DELPHI STUDY AND PRACTITIONER FOCUS GROUPS

Jessica Holding

Australia

A-1266 PATIENTS EXPERIENCE OF AND ATTITUDES TOWARDS ENGAGING IN OCCUPATION AND/OR OCCUPATION-BASED INTERVENTIONS FOLLOWING A HAND RELATED DISORDER

Alice Ørts Hansen

Denmark

A-1267 PRACTICAL TIPS AND TRICKS ON HOW TO IMPLEMENT OCCUPATION-BASED INTERVENTIONS IN HAND THERAPY - SHARING IDEAS

Karin Boer

The Netherlands

A-1268 SETTING THE STAGE

Harm Slijper

the Netherlands

A-1269 MULTI-LEVEL USE OF OUTCOME DATA; A WIN-WIN-WIN SITUATION

Ruud Selles

the Netherlands

A-1270 HOW DO WE DETERMINE THE QUALITY OF AN OUTCOME MEASURE?

Joy C MacDermid

Canada

A-1271 TOWARDS EASY AND HARMONIZED OUTCOME MEASUREMENT: ICHOM HAND AND WRIST 2.0

Robbert Wouters

the Netherlands

A-1272 THE CLINICIAN PERSPECTIVE: HOW TO USE PATIENT REPORTED OUTCOMES IN CLINICAL PRACTICE?

Sarah Ewald

Switzerland

A-1273 PATIENT PERSPECTIVE ON COMPLETING PROMS; SHOULD I RESPOND OR NOT?

Sebas Peters

the Netherlands

A-1274 REAL-WORLD DATA IN FLEXOR TENDON REHABILITATION: LESSONS FROM A CLINICAL REGISTRY

Bernadette Tobler-Ammann

Switzerland

A-1275 COLLECTING OUTCOME-DATA IN ROUTINE HANDSURGICAL SETTINGS - CHALLENGES AND CHANCES

Ben Schacher

Germany

A-1276 NERVE INJURIES AND MOTOR RELEARNING

Agnes Sturma

Austria

A-1277 NERVE INJURIES AND SENSORY RELEARNING / RE-EDUCATION

Ulrika Wijk

Sweden

A-1278 INFLUENCING FACTORS AFTER NERVE INJURIES

Paul de Buck

Belgium

A-1279 THE HIDDEN IMPACT: PSYCHOLOGICAL EFFECTS AFTER TRAUMATIC NERVE INJURY

Caroline Miller

UK

A-1280 HAND FRACTURES: NON-OPERATIVE HAND THERAPY VS SURGERY – WHEN AND WHY?

Ben Cunningham

Australia

A-1281 FIX IT OR LEAVE IT? THE SURGICAL CASE FOR HAND FRACTURE MANAGEMENT

Gordon McArthur

United Kingdom

A-1282 SPLINTS, SKILLS, AND SUCCESS: THE POWER OF NON-OPERATIVE HAND FRACTURE MANAGEMENT

Giulia Pompili

Italy

A-1283 FROM WAITLIST TO WORKLOAD: STRATEGIC “HAND-OFF” MODELS FOR SUSTAINABLE IN OCCUPATIONAL THERAPY SERVICES

Laura Carotenuto

Switzerland

A-1284 BALANCING TIME, TOUCH, AND TECHNOLOGY: MODERN STRATEGIES IN HAND THERAPY

Paolo Giotto

Italy

A-1285 HANDS-ON VS. HANDS-OFF: REDEFINING CLINICAL PRIORITIES IN AN AGING AND OVERLOADED HEALTHCARE SYSTEM

Francesca Pertile

Italy

A-1286 CMC-1 OSTEOARTHRITIS: STATE OF THE ART IN CONSERVATIVE MANAGEMENT

Rachael Bamford

United Kingdom

A-1287 RETHINKING CMC-1 OA: TREATMENT PATHWAYS THROUGH EVIDENCE

Lisa Esteban Lopez

The Netherlands

A-1288 FROM SURGERY TO FUNCTION – THERAPY FOLLOWING DUAL-MOBILITY IMPLANT ARTHROPLASTY

Ulla Jörn Good

Switzerland

A-1289 LIFE AFTER CMC-1 SURGERY: REHABILITATION NEEDS AND PATIENT EXPERIENCES

Elske Bonhof

The Netherlands

A-1290 CHAT GTP IN HAND THERAPY - HOW TO ASK QUESTIONS “AVOIDING FAKE NEWS IN CHATGTP OUTPUTS”

Miriam Marks

Switzerland

A-1291 PRACTICE-BASED EVIDENCE OR EVIDENCE-BASED PRACTICE?

Tara Packham

Canada

A-1292 I ASKED GOOGLE...”: HOW AI AND ONLINE CONTENT INFLUENCE RECOVERY EXPECTATIONS

Daniel Ceh

UK

A-1293 AI-SUPPORTED MENTORSHIP IN HAND THERAPY: BRIDGING THE EVIDENCE-TO-PRACTICE GAP

Robyn Midgley

South Africa

A-1294 RESTORING BALANCE AND FUNCTION: EVIDENCE-BASED REHABILITATION OF EXTENSOR TENDON INJURIES

Melissa Hirth

Australia

A-1295 RESTORING BALANCE AND FUNCTION: EVIDENCE-BASED REHABILITATION OF EXTENSOR TENDON INJURIES

Julianne Howell

USA

A-1296 ARTIFICIAL INTELLIGENCE IN THE THERAPIST'S TOOLBOX: FROM PREDICTION TO PERSONALIZATION

Michael Oyewale

Switzerland

A-1297 THE WORLD OF VIRTUAL REALITY IN HAND THERAPY. A NEW TECHNOLOGY FOR TREATING HAND INJURIES

Tom Lattré

Belgium

A-1298 HYPE OR HOPE? BARRIERS, ETHICS, AND THE FUTURE OF AI/VR IN HAND THERAPY

Mario Gaetano Fioretti

Switzerland

A-1299 CURRENT STATUS OF CONSERVATIVE AND SURGICAL TREATMENT OF DISTAL RADIUS FRACTURES IN 2026

Hugo Pelet

France

A-1300 REHABILITATION AFTER A DISTAL RADIUS FRACTURE : WHAT BALANCE SHOULD THERAPISTS STRIKE?

Grégory Mesplié

France

A-1301 WHAT WE MISS EARLY—AND WHAT STILL EMERGES: COMPLICATIONS AFTER DISTAL RADIUS FRACTURE

Aviva Woff

USA

A-1302 ADVANCED THERAPY PRACTITIONERS: EXPERIENCES, FRAMEWORKS AND LESSONS LEARNED FROM THE UK – DEVELOPMENT OF ADVANCED CLINICAL PRACTICE AND CONSULTANT THERAPY ROLES; FRAMEWORKS FOR COMPETENCIES; SAFEGUARDING FOR ADVANCED ROLES

Sarah Mee

UK

A-1303 ADVANCED HAND THERAPY PRACTITIONERS: HOW THEY FIT INTO THE MULTIDISCIPLINARY HAND TEAM - ROLES, BENEFITS; UK ROLES IN TRAUMA AND ACQUIRED CONDITIONS - VIDEO MONTAGE OF 5 UK HAND SURGEONS

Sarah Mee

UK

A-1304 FIRST EXPERIENCES WITH AP ROLE IN SWITZERLAND

Nadine Schulz, Simon Roner

Switzerland

A-1305 MY EXPERIENCE OF BEING AN ACP HAND THERAPIST IN THE UK: CHALLENGES AND SUCCESSES

Leanne Topcuoglu

UK

A-1306 RETURN TO WORK AFTER FLEXOR TENDON INJURY – PATIENT PERSPECTIVES

Tamara Hauri

Switzerland

A-1307 RETURN TO WORK OUTCOMES AFTER ELECTIVE HAND SURGERY

Reinier Feitz

The Netherlands

A-1308 USING THE IGLOO FRAMEWORK TO SUPPORT SUSTAINABLE HEALTH AND WELLBEING

Jo Yarker

UK

A-1309 HOW CAN WE BEST SUPPORT OUR PATIENTS WITH WORK PARTICIPATION? FACILITATED DISCUSSION

Lisa Newington

UK

A-1310 CORE STABILITY AND MYOFASCIAL CHAIN: A GLOBAL APPROACH TO AN INTEGRATED KINETIC CHAIN
UPPER LIMB REHABILITATION

Fabrizio De Lazzari

Italy

A-1311 THE HAND-SHOULDER INTERPLAY: UNDERSTANDING SHOULDER DYSFUNCTION ORIGINATING FROM HAND
AND WRIST PATHOLOGIES

Simone Scaglioni

Italy

A-1312 SHIFTING FOCUS IN LATERAL EPICONDYLALGIA: FROM LOCAL PATHOLOGY TO KINETIC CHAIN (DYS-)
FUNCTION AND LOAD MANAGEMENT

Luigi Di Filippo

Italy

A-1313 THE HAND: A FUNCTIONAL INTEGRATED LINK OF A COMPLEX KINETIC CHAIN

Isabella Monnanni

Italy

A-1314 CASTING MOTION TO MOBILISE STIFFNESS (CMMS): FOUNDATIONS, CLINICAL APPLICATION & HANDS-ON
CASTING LAB

Robyn Midgley, Johanna Jacobson-Petrov

A-1315 HAND THERAPY BASED ON THE SPIRALDYNAMIK® CONCEPT

Sandra Leu

Switzerland

A-1316 NRX WORKSHOP - EMPOWERMENT FOR THE DAILY LIFE WITH SOFT-STRAP ORTHOTIC SOLUTIONS IN CHALLENGING UPPER EXTREMITY CONDITIONS

Thomas Eriksson, Nicole Koza

Sweden, Austria

A-1317 HAND/WRIST HACKATHON: FROM CLINICAL QUESTION TO RESEARCH FINDINGS

Lisa Hoogendam

The Netherlands

A-1318 MEANINGFUL MOTION: CREATIVE PATHWAYS TO PURPOSEFUL ENGAGEMENT IN HAND THERAPY

Sarah Ewald

Switzerland

A-1319 PRINCIPLES OF SOMATOSENSORY REHABILITATION

Tara Packham

Canada

A-1320 SMALL ACTIVITIES, BIG IMPACT: A RESILIENCE-BASED MINI-ACTIVITIES APPROACH IN REHABILITATION

Barbara Aegler, Fay Zischek

Switzerland

A-1321 UNDERSTANDING ULNAR SIDED WRIST PAIN, A STRUCTURED APPROACH

Rob Van Huis, Pierre Yves Pennehouat

The Netherlands

A-1322 FIRST LOOK: ULTRASOUND FOR THE HAND AND WRIST

Daan Wessing

Netherlands

A-1323 FIRST LOOK: ULTRASOUND FOR THE HAND AND WRIST

Daan Wessing

Netherlands

A-1324 ELECTRICAL STIMULATION FOR HAND INJURIES

Marlene Arnold, Beatrice Kobi, Aurora DeFilippo

A-1325 MUSICIANS IN PAIN: A HAND THERAPISTS' GUIDE

Nicola Goldsmith, Saba Kamal

UK, USA

A-1326 TREATING THE PAINFUL HAND: LISTEN, OBSERVE AND TOUCH

Alison Taylor

USA

A-1327 UNDERSTANDING BEHAVIOUR OF COLLAGEN THROUGH MOBILISATION TECHNIQUES

Vicenç Punsola Izard

Spain

A-1328 UNDERSTANDING BEHAVIOUR OF COLLAGEN THROUGH MOBILISATION TECHNIQUES

Vicenç Punsola Izard

Spain

A-1329 FUNCTION VERSUS CONTRACTURE (CONSERVATIVE TREATMENT: THERAPY)

Tahra Babiker-Moore

UK

A-1330 DO LESS, ACHIEVE MORE (MINIMAL INVASIVE TREATMENT)

Esther Vögelin

Switzerland

A-1331 SLOW BUT SURE (EXTERNAL FIXATOR AS A STEP IN BETWEEN)

Massimo Corain

Italy

A-1332 DO MORE, TAKE THE RISK (MAIOR SURGERY IN DUPUYTREN)

David Warwick

UK

A-1333 INTERACTIVE CASE DISCUSSIONS: BEST AND WORST-CASE SCENARIOS

Martina Greminger, Ilse Degreef

Switzerland

A-1334 INTRODUCTION OF BASEL AND WALANT

Noemie Devaux

Switzerland

A-1335 RESTORATION OF THE BALANCE IN HAND THERAPY WITH WALANT SURGERY

Zeynep Tuna-Emir

Türkiye

A-1336 RESTORATION OF THE BALANCE IN NERVE SURGERY WITH WALANT

Elisabet Hagert

Qatar

A-1337 RESTORATION OF THE BALANCE IN EXTENSOR TENDON SURGERY WITH WALANT

Egemen Ayhan

Turkey

A-1338 RESTORATION OF THE BALANCE IN FLEXOR TENDON SURGERY WITH WALANT

Jin Bo Tang

China

A-1339 RESTORATION OF THE BALANCE IN BONE SURGERY WITH WALANT

Amir Adham Ahmad

Malaysia

A-1340 RESTORATION OF THE BALANCE OF PATIENT EXPERIENCE WITH WALANT

Donald Lalonde

Canada

A-1342 HAND THERAPY

Tamara Hauri

Switzerland

A-1343 ONCOLOGIC DEFECTS

Bruno Battiston

Italy

A-1344 BURNS/INFECTION

Bauback Safa

USA

A-1345 TRAUMATIC DEFECTS

Florian Früh

Switzerland

A-1346 INTRODUCTION: MARCO KELLER

Switzerland

A-1347 OVERVIEW OF ARTIFICIAL INTELLIGENCE IN HAND SURGERY AND ITS IMPLEMENTATION INTO DAILY PRACTICE

Jorma Ryhänen

Finland

A-1348 AI-BASED PHASE RECOGNITION FOR DISTAL RADIUS FRACTURE

Philippe Liverneaux

France

A-1349 MIXED REALITY ASSISTED PERCUTANEOUS SCAPHOID FIXATION: A PROPOSED NEW SURGICAL TECHNIQUE

Thomas Grégory

France

A-1350 ADVANCEMENTS IN ROBOTIC MICROSURGERY, THE MUSA-3 ROBOT

Tom van Mulken

the Netherlands

A-1351 ALGORITHM VERSUS EXPERT: MACHINE LEARNING VERSUS SURGEON-PREDICTED SYMPTOM IMPROVEMENT AFTER CARPAL TUNNEL RELEASE

Nina Loos

Netherlands

A-1352 LITERATURE SEARCH AND SYNTHESIS WITH AI TOOLS

Miriam Marks

Switzerland

A-1353 LARGE LANGUAGE MODELS FOR MANUSCRIPT REVIEW: CURSE OR BLESSING?

Grey Giddins

UK

A-1354 LEGAL ASPECTS OF USING AI TOOLS IN MEDICINE

Djamila Batache

Switzerland

A-1355 EPIDEMIOLOGY OF PAEDIATRIC NERVE INJURIES

Martin Aman

Germany

A-1356 MYTHS BUSTERS: DEALING WITH THE PREJUDICES OF PAEDIATRIC NERVE

Leila Harhaus

Germany

A-1357 NERVE INJURIES AND PAEDIATRIC FRACTURES – WHAT IS SO SPECIAL?

Piotr Czarnecki

Poland

A-1358 DO CHILDREN NEED DIFFERENT APPROACHES IN NERVE REPAIR THAN ADULTS?

Lea Estermann

Switzerland

A-1359 DO CHILDREN SUFFER FROM NEUROPATHIC PAIN?

Jonathan Isaacs

USA

A-1360 OCCUPATIONAL THERAPY MANAGEMENT OF RADIAL NERVE INJURY AFTER PEDIATRIC SUPRACONDYLAR HUMERUS FRACTURES

Sandra Mocker

Austria

A-1361 COMPLEX 3D CASE PRESENTATION

Sumedh Talwalkar

UK

A-1362 HAND THERAPY PERSPECTIVE

Sarah Ewald

Switzerland

A-1363 TRADITIONAL/CONVENTIONAL TECHNIQUES

Martin Langer

Germany

A-1364 3D TECHNIQUE DEEP DIVE & PITFALLS

Simon Roner

Switzerland

A-1365 INDICATIONS AND CONTRAINDICATIONS FOR WRIST ARTHROPLASTY: BALANCING FUNCTIONAL NEEDS AND PATIENTS' CHARACTERISTICS

Ole Reigstad

Norway

A-1366 'JUST RIGHT OR OVERSTUFFED?' SOFT TISSUE BALANCE FOR OPTIMAL RESULTS

Simon Farnebo

Sweden

A-1367 COMPLICATIONS AND RELEVANT FACTORS TO PREVENT THEM

Daniel Brown

UK

A-1368 THE CENTRE OF ROTATION: BIOMECHANICAL DATA IN CADAVERS

Greg Bain

Australia

A-1369 IN VIVO 3D MOTION ANALYSIS OF WRIST REPLACEMENT

Maurizio Calcagni

Switzerland

A-1370 POST-OPERATIVE REHABILITATION. THE CHALLENGING BALANCE BETWEEN HEALING AND FUNCTION

Vera Beckmann-Fries

Switzerland

A-1371 THE PROBLEM - NO TECHNIQUE CAN GUARANTEE THE RESULT

Pierluigi Tos

Italy

A-1372 PERSISTING NEUROPATHIC PAIN FOLLOWING TMR: TECHNIQUE FAILURE, CONSTRAINTS OR CONCEPT DRAWBACKS?

Olga Politikou

Switzerland

A-1373 PRINCIPLES OF APPROACH TERMINAL AND CONTINUITY NEUROMAS

Joaquim Casañas

Spain

A-1374 HOW TO OPTIMIZE PATIENT SELECTION FOR TREATING NEUROPATHIC PAIN: A MULTIDISCIPLINARY APPROACH

Henk Coert

The Netherlands

A-1375 HOW TO BALANCE OUR APPROACH WITH MEDICATIONS, PERIPHERAL NERVE STIMULATORS AND SURGERY

Kyle Eberlin

USA

A-1376 NON-SURGICAL VERSUS SURGICAL OPTIONS IN PATIENTS WITH NEUROPATHIC PAIN FROM THE PERSPECTIVE OF HAND THERAPY

Sarah Ischer
Switzerland

A-1377 INTRODUCTORY CASE: SCAPHOID FRACTURE WITH AUDIENCE POLL

Pascal Hannemann
The Netherlands

A-1378 RESTORING THE BALANCE OF ANATOMY: SURGICAL TREATMENT OF ACUTE SCAPHOID FRACTURES

Philipp Honigmann
Switzerland

A-1379 CASE: SCAPHOID NONUNION WITH AUDIENCE POLL

Pascal Hannemann
The Netherlands

A-1380 BALANCED HEALING: NON-VASCULARIZED OPTIONS FOR SCAPHOID NONUNION

Pascal Hannemann
The Netherlands

A-1381 CASE: IRREPARABLE SCAPHOID NONUNION WITH AUDIENCE POLL

Pascal Hannemann
The Netherlands

A-1382 RESTORING THE BALANCE OF FUNCTION: SALVAGE OPTIONS FOR IRREPARABLE SCAPHOID NONUNION

Frederik Verstreken
Belgium

A-1383 CASE: CHALLENGING SCAPHOID FRACTURE WITH AUDIENCE POLL

Pascal Hannemann

The Netherlands

A-1384 RESTORING THE BALANCE OF ANATOMY: SURGICAL TREATMENT OF CHALLENGING SCAPHOID FRACTURES

Philipp Honigmann

Switzerland

A-1385 CASE: CHALLENGING SCAPHOID NONUNION WITH AUDIENCE POLL

Pascal Hannemann

The Netherlands

A-1386 BALANCED HEALING: VASCULARIZED OPTIONS FOR CHALLENGING SCAPHOID NONUNION

Pascal Hannemann

The Netherlands

A-1387 CASE: IRREPARABLE SCAPHOID NONUNION WITH AUDIENCE POLL

Pascal Hannemann

The Netherlands

A-1388 RESTORING THE BALANCE OF FUNCTION: SCAPHOID REPLACEMENT

Frederik Verstrecken

Belgium

A-1389 INTERACTIVE PANEL DISCUSSION WITH LIVE Q&A

Pascal Hannemann, Philipp Honigmann, Frederik Verstrecken

The Netherlands, Belgium

A-1390 FROM KIENBOCK DISEASE TO KIENBOCK DISEASE ADVANCED COLLAPSE

Simon MacLean

New Zealand

A-1391 RADIOLOGIC CHARACTERISTICS OF KIENBOCK DISEASE

Jan-Peter Grunz

Germany

A-1392 NEW CONCEPTS OF ADVANCED ARTHROSCOPIC MANAGEMENT OF KIENBOCK DISEASE

Greg Bain

Australia

A-1393 DECISION MAKING ON THE WAY TO A PERSONALIZED TREATMENT FOR KIENBOCK DISEASE

Mathias Häfeli

Switzerland

A-1394 BRINGING IT ALL TOGETHER: PANEL CASE DISCUSSION

All speakers/chairs

A-1395 INTRODUCTION: ALISSA GÜBELI

Switzerland

A-1396 CASE 1: RADIOCARPAL BALANCE FOLLOWING DRF

Radek Kebrle

Czech Republic

A-1397 CASE 2: DRUJ BALANCE FOLLOWING DRF

Alissa Gübeli

Switzerland

A-1398 CASE 3: BALANCE BETWEEN OPERATIVE AND CONSERVATIVE TREATMENT IN GERIATRIC DRF

Rohit Arora

Austria

A-1399 CASE 4: DO WE NEED IMMOBILIZATION AFTER DRF

Sarah Mee

United Kingdom

A-1400 CASE 5: SURPRISE

Rohit Arora

Austria

A-1401 CLOSING REMARKS

Alissa Gübeli

Switzerland

A-1402 ELBOW FUNCTION - TRICEPS VS BICEPS

Caroline Leclercq

France

A-1403 WRIST DEFORMITY - WRIST FUSION VS TENDON TRANSFER OR HSN ALONE?

Peter Rhee

USA

A-1404 FINGER FLEXOR TONE -TENDON LENGTHENING VS. HSN

Wee Lam

UK/Singapore

A-1405 THUMB IN PALM DEFORMITY OPTIONS

Shai Luria

Israel

A-1406 INTRODUCTION: RONIT WOLLSTEIN

USA

A-1407 CONSENSUS TESTING OF OUTCOMES FEASIBILITY

Sarah Ewald

Switzerland

A-1408 ICHOM, STRENGTHS, WEAKNESSES

Maurizio Calcagni

Switzerland

A-1409 INTEGRATING AN OUTCOME MEASUREMENT TOOL NATIONALLY

Marianne Arner

Sweden

A-1410 STRENGTH OF COMBINING SUBJECTIVE AND OBJECTIVE PARAMETERS

Esther Vögelin

Switzerland

A-1411 SUMMARY, DISCUSSION ON HOW TO PROVIDE A NUMBER OF TESTS THAT CAN BE USED TO COMPARE AND COMBINE DATA

Ronit Wollstein, Esther Vögelin, Panelists

All

A-1412 EMERGENCY MANAGEMENT OF BLAST INJURIES

Ankur Pandya

UK

A-1413 SURGICAL RECONSTRUCTION OF HAND FUNCTION AFTER WARFARE INJURIES

Andrii Lysak

Ukraine

A-1414 MAIN PRINCIPLES OF MICROSURGICAL RECONSTRUCTION AFTER HIGH-ENERGY BALLISTIC TRAUMA

Thomas Giesen

Switzerland

A-1415 THE PLACE AND ROLE OF HAND THERAPY IN THE TREATMENT OF WARFARE INJURIES

Francesco Romagnoli

Italy

A-1416 PSYCHOLOGICAL ISSUES OF WARFARE INJURY AND REHABILITATION OF WAR VICTIMS

Tomer Sabag

Israel

A-1417 CLINICAL CASES AND DISCUSSION

Anna Kyrpychova, Ankur Pandya, Tiziana Roggio

Ukraine, UK

A-1418 DYNAMIC ULTRASOUND EXAMINATION: EXPLORING THE FULL POTENTIAL OF ULTRASOUND

Carla Nunes

Portugal

A-1419 ULTRASOUND ASSESSMENT OF HAND AND WRIST TUMORS

Sebastian Kluge

Switzerland

A-1420 FRACTURE SONOGRAPHY: FROM HIDDEN FRACTURE TO ULTRASOUND-ASSISTED REDUCTION

Javier Ferreira

Spain

A-1421 TOP 5 ULTRASOUND-GUIDED INJECTIONS THAT CHANGED MY PRACTICE

Fernando Dávila Fernández

Spain

A-1422 ULTRASOUND GUIDED SURGERY: HOW TO START AND THE BEST EVIDENCE BASED PROCEDURES TO INCORPORATE

Carla Nunes

Portugal

A-1423 HOW NOT TO WRITE AN ABSTRACT

Camillo Fulchignoni

Italy

A-1424 HOW TO WRITE AN ABSTRACT

Nicolas Bigorre

France

A-1425 DISCUSSION

Mirjam Thielen

Germany

A-1426 HOW TO MAKE A BAD PRESENTATION

Jonathan Hobby

UK

A-1427 HOW TO MAKE A GOOD PRESENTATION

Dean Boyce

UK

A-1428 DISCUSSION

Elisabeth Haas-Lützenberger

Germany

A-1429 SESSION SUMMARY

Marco Keller

Switzerland

A-1430 STAGING OF DUPUYTREN: DOES IT MAKE SENSE?

Wee Lam

UK

A-1431 DUPUYTREN'S CURSE: INHERITANCE AS PREDICTIVE VALUE OR TREATMENT GUIDANCE

Ilse Degreef, Charles Eaton

Belgium

A-1432 DUPUYTREN IRRADIATION

Roel Steenbakkens

The Netherlands

A-1433 WALANT IN DUPUYTREN

Donald Lalonde

Canada

A-1434 DUPUYTREN: A TREATMENT ALGORITHM

Hester Kan

The Netherlands

A-1435 SALVAGE IN DUPUYTREN

Michelle Spiteri

UK

A-1436 HOW TO PREPARE FOR REPLANTATION (WHAT THE SURGEON MUST KNOW ABOUT THE INJURY BEFORE RECEIVING IT)

Massimo Corain

Italy

A-1437 REPLANTATION IN NORTHERN EUROPE - DANISH EXPERIENCE

Jerzy Stiasny

Denmark

A-1438 REPLANTATION IN SOUTHERN EUROPE - GREEK EXPERIENCE

Sokratis E. Varitimidis

Greece

A-1439 ALTERNATIVES TO REPLANTATION (SPARE-PART SURGERY, KRUKENBERG PROCEDURE, ETC.)

Andrii Lysak

Ukraine

A-1440 SPARE-PARTS IN BIONIC RECONSTRUCTION

Paolo Sassu

Italy

A-1441 HAND TRANSPLANTATION

Rohit Aurora

Austria

A-1442 DISCUSSION AND SUMMARY

Massimo Corain

Italy

A-1443 HTC REPRESENTATIVES MEETING

Massimo Corain, Andrii Lysak

A-1444 INTRODUCTION: ANDREA ATZEI, SEBASTIAN GÜNKEL, JANE MESSINA

Italy, Switzerland, Italy

A-1445 CLINICAL CASE: SL INJURIES

Alfonso Prada

Spain

A-1446 OPEN SURGEON PERSPECTIVE

Andreas Schweizer

Switzerland

A-1447 HAND THERAPIST PERSPECTIVE

Rosario Baladron

France

A-1448 LIVE POLLING

Sebastian Güntel

Switzerland

A-1449 DISCUSSION

Jane Messina

Italy

A-1450 CLINICAL CASE: TFCC INJURIES

Marco Guidi

Switzerland

A-1451 OPEN SURGEON PERSPECTIVE

Alex Lluch

Spain

A-1452 ARTHROSCOPIC SURGEON PERSPECTIVE

Robert Gvozdenovic

Denmark

A-1453 HAND THERAPIST PERSPECTIVE

Silvio Tocco

Italy

A-1454 LIVE POLLING

Sebastian Güntel

Switzerland

A-1455 DISCUSSION

Andrea Atzei

Italy

A-1456 WRAP-UP & TAKE-HOME MESSAGE

Andrea Atzei, Sebastian Güntel, Jane Messina

Italy, Switzerland, Italy

A-1457 SOCIAL MEDIA IN HAND SURGERY

Philipp Honigmann

Switzerland

A-1458 INFORMATION THROUGH WEBSITES

Jane Messina

Italy

A-1459 FESSH COMMUNICATION: WHAT'S UP AND HOW HAS IT GROWN IN RECENT YEARS?

Viviana Maja Rosero, Jantine Posthuma de Boer

Hungary, the Netherlands

A-1460 SOCIAL MEDIA: WHAT DO THE YOUNG SURGEONS PREFER?

Lucian Lior Marcovici

Italy

A-1462 GENDER, DIVERSITY AND INCLUSION

Elisabet Hagert

Qatar

A-1463 HOW ARE WE DOING IN WORK AND LIFE BALANCE – QUESTIONNAIRE AMONG HAND SURGEONS IN EUROPE

Nora Huber

Switzerland

A-1464 BURN OUT

Fred Schreuder

United Kingdom

A-1465 MORAL INJURY

Mauro Maniglio

Switzerland

A-1466 RESILIENCE

Jonathan Hobby

United Kingdom

A-1467 ROUND TABLE – SEVERAL TOPICS TO DISCUSS

All chairs and presenters

A-1468 ELBOW UCL INJURIES IN THE ELITE ATHLETE

Jonathan Teuting

USA

A-1469 LONGITUDINAL INSTABILITY OF THE FOREARM: NAMING YOUR ENEMY IS THE KEY TO WIN

Enrico Carità

Italy

A-1470 POSTEROLATERAL INSTABILITY AND TERRIBLE TRIAD: DIAGNOSTIC ELEMENTS AND TREATMENT KEY POINTS

Paolo Arrigoni

Italy

A-1471 TOP 5 ELBOW ISSUES IN ATHLETES

Michael Glanzmann

Switzerland

A-1472 MICROSURGICAL RECONSTRUCTION OF CONGENITAL HAND DIFFERENCES

Gilles Dautel

France

A-1473 PROSTHETIC OPTIONS FOR HAND RECONSTRUCTION IN HAND ANOMALIES AND FUTURE APPLICATIONS

Michael Schaefer

Switzerland

A-1474 ADAPTATION AND HELPING TOOLS TO ENHANCE GRIPPING IN CONGENITAL ANOMALIES

Lene Bobakk

Norway

A-1475 ROUND TABLE DISCUSSION WITH CASES

Branavan Sivakumar, Alexandre Kämpfen

Switzerland

A-1476 CLINICAL EXAM CTS, COMPLEMENTARY EXAM CTS, TYPE OF SURGICAL TREATMENT CTS, TREATMENT EXPECTATIONS CTS

Xavier Gueffier Vs. Claire Freiburg Vs. Paul De Buck

France vs. Switzerland vs. Belgium

A-1480 CLINICAL EXAM CMC I, COMPLEMENTARY EXAM CMC I, TYPE OF SURGICAL TREATMENT CMC I, TREATMENT EXPECTATIONS CMC I

Martin Richter vs. Quentin Schopfer vs. Marloes Hofstra
Germany vs. Belgium Vs. Netherlands

A-1484 INTRODUCTION: LESSONS LEARNED

Ankur Pandya
UK

A-1485 HOW TO INSTALL SUSTAINABLE PARTNERSHIPS

Hugues Tiemdjo
France

A-1486 IMPORTANCE OF HAND THERAPY

Marianne von Haller
Switzerland

A-1487 DISCUSSION

Dominique Merky, Urs Hug
Switzerland

A-1488 INTERVIEW WITH ALESSANDRO ESPOSITO, SOCCER PLAYER FC INTERLAKEN WITH A HAND DIFFERENCE, AGED 10 YEARS OLD

Alessandro Esposito
Switzerland

A-1489 THE CHALLENGES OF CONGENITAL UPPER LIMB DIFFERENCES

Daniel Weber
Switzerland

A-1490 THE CHALLENGES FOR DOCTORS WHO CARE FOR CONGENITAL UPPER LIMB DIFFERENCES – THE FIRST CONSULTATION

Gill Smith

UK

A-1491 HOW TO SUPPORT A FAMILY'S PATH TO HAPPINESS

Simone Portmann

Switzerland

A-1492 HOW TO WORK HAPPILY

Urs Egli

Switzerland

A-1493 INTRO TO PIPJ ANATOMY & BIOMECHANICS

Zaf Naqui

UK

A-1494 PIPJ MDT CASE FORUM

Elisabet Hagert, Marta Siekierska, Andrea Moser, Alex Lluch, Zaf Naqui, Vicenç Punsola Izard

Sweden/Qatar, Poland, Austria, Spain, UK, Spain

A-1495 CONCLUSION: PEARLS & PITFALLS

Vicenç Punsola Izard

Spain

A-1496 INTRO TO DRUJ ANATOMY & BIOMECHANICS

Elisabet Hagert

Sweden/Qatar

A-1497 DRUJ MDT CASE FORUM

Zaf Naqui, Alex Lluch, Marta Siekierska, Andrea Moser, Vicenç Punsola Izard, Elisabet Hagert
UK, Spain, Poland, Austria, Spain, Sweden/Qatar

A-1498 CONCLUSION: PEARLS AND PITFALLS

Alex Lluch
Spain

A-1499 AVOIDING COMPLICATIONS

Daniel B. Herren
Switzerland

A-1500 RED FLAGS IN THERAPY, WHEN SHOULD THE THERAPIST CALL THE SURGEON?

Ulla Jörn Good
Switzerland

A-1501 NEW SYMPTOMS IN OLD IMPLANTS: DIAGNOSTICS

Joris Duerinckx
Belgium

A-1502 SOFT TISSUE COMPLICATIONS: PROPHYLAXIS AND TREATMENT

Adil Trabelsi
France

A-1503 REVISION STRATEGIES IN POSSIBLE IMPLANT IMPINGEMENT

Benjamin Panzram
Germany

A-1504 REVISION STRATEGIES FOR CUP LOOSENING

Pierre Emmanuel Chammas
France

A-1505 HOW TO PERFORM PROPERLY A RESECTION AFTER IMPLANT FAILURE

Leila Harhaus

Germany

A-1506 SUMMARY WITH TIPS AND TRICKS

Frederik Verstreken

A-1507 WHAT DOES CRPS REALLY LOOK LIKE?

Francisco del Piñal

Spain

A-1508 CLINICAL ASSESSMENT STRATEGIES FOR IMPLEMENTING THE VALENCIA CRITERIA

Tara Packham

Canada

A-1509 PATHOPHYSIOLOGY-DRIVEN MANAGEMENT OF CRPS

Michael Alexander Harnik

Switzerland

A-1510 CRITERIA AND SURGICAL APPROACH FOR CPRS UPPER LOWER LIMB

Joaquim Casañas

Spain

A-1511 THERAPISTS' MANAGEMENT OF CRPS

Isabelle Quintal

A-1512 THE PROBLEM THROUGH A CASE PRESENTATION

Bruno Battiston

Italy

A-1513 NERVE TRANSFERS

Jörg Bahm

Germany

A-1514 TENDON TRANSFERS

Rémy Liechti

Switzerland

A-1515 WHY NOT COMBINING THEM? (BASED ON A CASE)

Bruno Battiston

Italy

A-1516 REWIRING MOVEMENT: MOTOR LEARNING PRINCIPLES IN NERVE TRANSFER REHABILITATION

Agnes Sturma

Austria

A-1517 REASSIGNING FUNCTION: TENDON TRANSFER REHABILITATION AND KEY DIFFERENCES IN MOTOR LEARNING

Sabrina Koch-Borner

Switzerland

A-1518 BALANCE IN MUSICIANS: HOW IT IS BUILT, HOW IT IS LOST, AND HOW WE SHOULD EXAMINE IT?

Eftal Güdemez

Türkiye

A-1519 REHABILITATION STRATEGIES TO RESTORE PHYSICAL, FUNCTIONAL AND ARTISTIC BALANCE

Nicola Goldsmith

UK

A-1520 RESTORATION OF INSTRUMENT – PERFORMER BALANCE

Gürsel Leblebicioglu

Türkiye

A-1521 THE BALANCED INTEGRATION OF MIND AND BODY

Sebnem Dural

Türkiye

A-1522 INTRODUCTION: CARINA REINHOLDT

Sweden

A-1523 GENERAL CONSIDERATIONS IN INTRINSIC RECONSTRUCTION

Silvia Schibli

Switzerland

A-1524 PASSIVE INTRINSIC RECONSTRUCTION IN TETRAPLEGIA: OUR PREFERRED SURGICAL TECHNIQUE

Johan Berg

Sweden

A-1525 ACTIVE INTRINSIC RECONSTRUCTION IN TETRAPLEGIA: OUR PREFERRED SURGICAL TECHNIQUE

Armin Pallaver

Switzerland

A-1526 BALANCING THE THUMB

Hannes Granberg

Sweden

A-1527 REHABILITATION CHALLENGES AFTER INTRINSIC RECONSTRUCTION: PEARLS AND PITFALLS

Sabrina Koch-Borner

Switzerland

A-1528 END OF SESSION

Carina Reinholdt

A-1529 M&H GROUP – WHERE WE ARE – NEW IDEAS

Pierluigi Tos

Italy

A-1530 MANGLED HAND: EVALUATION, ASSESSMENT AND PRIORITIES IN THE SURGICAL MANAGEMENT

Sophia Syngouna

Greece

A-1531 RECONSTRUCTION IN MANGLED HAND - RESTORING FUNCTION

Fatih Kabakaş

Turkey

A-1532 MICROSURGICAL COVERAGE OF SMALL DEFECTS OF THE HAND

Bauback Safa

USA

A-1533 MICROSURGICAL EMERGENCIES IN BABIES

Carla Baldrighi, Mike Ruettermann, Gill Smith

Dubai, The Netherlands, UK

A-1534 COMPOSITE GRAFTS IN PEDIATRIC FINGERTIP AMPUTATIONS: WHAT THE EVIDENCE REALLY SHOWS

Andrea Jester

UK

A-1535 THE ATASOY FLAP IN PEDIATRIC FINGERTIP TRAUMA

Céline Klein

France

A-1536 FLEXOR TENDON REPAIRS. ACUTE REPAIR VS RECONSTRUCTION IN CHILDREN

Bran Sivakumar, Nouf Al Turki, Alexandre Kämpfen

UK, Switzerland

A-1537 TRIGGER THUMBS ACROSS EUROPE

Christina Lipede

UK

A-1538 SYNDACTYLY SURGERY TIMING

Gergő Józsa

Hungary

A-1539 INTRODUCTION TO SESSION

Esther Vögelin

Switzerland

A-1540 INTRODUCTION TO SI

Henk Coert

Netherlands

A-1541 ACHIEVING BALANCE IN TENDON REPAIR

Jin Bo Tang

China

A-1542 THE BALANCE BETWEEN ARTIFICIAL AND HUMAN INTELLIGENCE IN CLINICAL PRACTICE

Philippe Liverneaux

France

A-1543 BALANCING SURGICAL AND CONSERVATIVE MANAGEMENT IN HAND FRACTURES: A PRACTICAL CLASSIFICATION APPROACH

Grey Giddins

UK

A-1544 BALANCE BETWEEN STABILITY AND MOBILITY IN WRIST ARTHROPLASTY

Ole Reigstad

Norway

A-1545 CARPOMETACARPAL JOINT ARTHROPLASTY: AVOIDING IMBALANCE AND OPTIMIZING OUTCOMES

Joris Duerinckx

Belgium

A-1546 NERVE TRANSFERS AND CENTRAL NERVOUS SYSTEM CONTROL IN BRACHIAL PLEXUS AND PERIPHERAL NERVE INJURIES: TOWARD A BALANCED RECONSTRUCTIVE STRATEGY

Gürsel Leblebicioğlu

Turkey

A-1547 THE BALANCED FINGER: BIOMECHANICS OF INTRINSIC AND EXTRINSIC SYSTEMS AND PRINCIPLES OF RECONSTRUCTION

Martin Langer

Germany

A-1548 TENDON VERSUS NERVE TRANSFERS – BALANCING HAND FUNCTION IN UPPER EXTREMITY HIGH NERVE INJURIES

Florian Früh

Switzerland

A-1549 RESTORING BALANCE IN THE DISTAL RADIOULNAR JOINT: ADVANCEMENTS IN MINIMALLY INVASIVE SURGICAL APPROACHES

Gerald Kraan

Netherlands

A-1550 STRUCTURAL BALANCE RESTORATION IN COMPLEX AND FOREARM PROBLEMS USING 3D TECHNOLOGY

Andreas Schweizer

Switzerland

A-1551 DUPUYTREN'S DISEASE: ACHIEVING A BALANCE BETWEEN NO TREATMENT, TREATMENT AND OVER-TREATMENT

Ilse Degreef

Belgium

A-1552 ACHIEVING BALANCE IN UPPER LIMB SPASTICITY MANAGEMENT

Wee Lam

Singapore

A-1553 IMPORTANT FACTORS TO RESTORE THE BALANCE IN PARAPLEGIC HAND CONDITIONS

Jan Friden

Switzerland

A-1554 ACHIEVING A BALANCE BETWEEN MOBILIZATION AND IMMOBILIZATION AFTER SURGICAL OR CONSERVATIVE TREATMENT OF THE HAND

Bernadette Tobler-Ammann

Switzerland

A-1555 WHAT DO EDITORS LOOK FOR AT FIRST GLANCE? SALAMI SLICING, DUAL SUBMISSIONS, PREVIOUSLY PUBLISHED DATA

Jane McEachan

UK

A-1556 WHAT DOES A CLINICAL REVIEWER LOOK FOR?

Julia Blackburn

UK

A-1557 WHAT DOES A STATISTICAL ADVISOR LOOK AT?

Miriam Marks

Switzerland

A-1558 WHICH OUTCOME MEASURES SHOULD I CHOOSE FOR MY STUDY?

Robbert Wouters
the Netherlands

A-1559 REPORTING GUIDELINES

Ruud Selles
Netherlands

A-1560 HOW TO HANDLE REVISIONS / RESPONDING TO REVIEWERS PROFESSIONALLY

Tim Hems
UK

A-1561 REASONS TO SUBMIT TO JHSE

Mike Ruettermann
Germany

A-1562 EXAMPLES FROM SUBMITTED MANUSCRIPTS. WHAT CAN BE IMPROVED?

Miriam Marks, Jane McEachan
Switzerland, UK

A-1563 IS EMPATHY THE KEY IN PATIENT CARE?

Esther Vögelin
Switzerland

A-1564 CAN DATA IMPROVE PATIENT EXPERIENCE?

Steven Hovius
The Netherlands

A-1565 THE BURDEN OF NEUROGENIC CRPS - VIDEO INTERVIEW WITH PATIENT

Switzerland

A-1566 RISK PATTERNS OF PAIN-RELATED COMPLICATIONS

Niklaus Egloff

Switzerland

A-1567 BETWEEN HOPE AND SETBACK

Manon Beglinger, Inken Spiering

Switzerland

A-1568 RECOGNIZING POST TRAUMATIC STRESS - FIREWORKS INJURY PATIENT VIDEO SYNDROME

Steven Hovius, Andrea Derks

The Netherlands

A-1569 TAKE HOME MESSAGES

Esther Vögelin, Niklaus Egloff, Steven Hovius, Andrea Derks, Manon Beglinger, Inken Spiering

A-1570 HAND SURGERY SHOWDOWN

Zaf Naqui

UK

A-1571 PASSING EBHS EXAM

Lindsay Muir

UK

A-1572 SIG PREVENTIONGROUP - WHAT HAS BEEN DONE AND NEXT GOALS

Mahdi Siala, Marlene O'Donaghue

France, Germany

A-1573 SCAPHOID NONUNION AUDIT

Will Mason, Harold Akerhurst

UK

A-1574 HOW TO ELIMINATE SCAPHOID NONUNION: THE IMPORTANCE OF THE EARLY DIAGNOSIS, THE SALFORD WAY

Zaf Naqui

UK

A-1575 THE ROLE OF ARTHROSCOPY TO PREVENT COMPLICATIONS

Pedro Delgado

Spain

A-1576 THE IMPORTANCE OF CHOOSING THE RIGHT IMPLANT FOR THE RIGHT FRACTURE

Luciana Marzella

Italy

A-1577 MISSED SCAPHOID FRACTURES, MEDICOLEGAL COSTS AND PREVENTION

Zoe Dailiana

Greece

A-1578 ARTHROSCOPIC SURGEON PERSPECTIVE

Pedro Delgado

Spain

A-1579 HOW TO MANAGE AND READJUST THE TENSION AND ALIGNMENT OF IMPLANTS?

Lionel Athlani, Alain Tchurukdichian

Switzerland, France

A-1580 WHAT ARE THE CONSEQUENCES FOR THE IMPLANT?

Bernard Prandi

A-1581 TREATING LONG-BONE INJURIES AND PIP FRACTURE DISLOCATION

Jorge L. Orbay

A-1582 WELCOME/INTRODUCTION - FESSH COMMUNICATION COMMITTEE: WHAT'S NEW?

Jantine Posthuma de Boer, Nikolai Karpinski

The Netherlands, Russia

A-1583 "THE MORAL CODE"- RULES IN USE OF SOCIAL MEDIA

Gemma Batten

UK

A-1584 RISKS OF LARGE LANGUAGE MODELS

Francesco Costa

Switzerland

A-1585 MANAGE NEGATIVE ONLINE PATIENT COMMENTS - A GUIDELINE

Mahdi Siala

France

A-1586 FROM BENCH TO FEED: USING AI TO AMPLIFY YOUR RESEARCH ON SOCIAL MEDIA

Mireia Esplugas

Spain

A-1587 AI IN SOCIAL MEDIA, HOW TO COPE WITH THE NEW REALITY

Roman Sorkin

Russia

A-1588 SOME AWARDS WINNER ANNOUNCEMENTS

Antonio Kory, Maria Larrea-Zabalo

Italy, Spain

A-1589 SURGICAL MANAGEMENT OF CHRONIC UE NEUROPATHY

Ivan Ducic

USA

A-1590 PRINCIPLES AND TECHNIQUES FOR TARGETED MUSCLE REINNERVATION IN THE UPPER EXTREMITY?

Kyle Eberlin

USA

A-1591 DISTAL RADIUS FRACTURE - CLINICAL CASE

Case Presenter: Luis Felipe Naquira Escobar
 Speakers: Catherine Bossut (Ireland), Christian Zegarra (Peru), Antonio Tufi (Brasil), Adeline Cambon (France)

A-1592 RIZARTHROSIS

Case Presenter: Enrico Carità
 Speakers: Fabio Suarez (Colombia), Fidel Cayon (Ecuador), Christian Castro (Costa Rica), Ellada Papadogeorgou (Greece)

A-1593 COMPLEX HAND TRAUMA

Case Presenter: Juan Manuel Breyer (Chile)
 Speakers: Balazs Lenkei (Hungary), Miguel Hernández (Mexico), Juan Carlos Gonzalez (Guatemala)

A-1594 FRACTURE FIXATION WORKSHOP

Shai Luria, Onur Berber

Israel, UK

A-1595 FRACTURE FIXATION WORKSHOP

Balázs Lenkei, Niels Schep

Hungary, The Netherlands

A-1596 DISTAL RADIUS MALUNION – PAEDIATRIC CASE WITH OPEN PHYSIS. HOW TO DEAL WITH THE REMAINING GROWTH: DIFFERENT APPROACHES

Frederik Verstrecken

Belgium

A-1597 DISTAL RADIUS MALUNION – PAEDIATRIC CASE WITH OPEN PHYSIS. HOW TO DEAL WITH THE REMAINING GROWTH: DIFFERENT APPROACHES

Lea Estermann
Switzerland

A-1598 SCAPHOID CASES 3D BASED VS FREE HAND WITH EMPHASIS ON GUIDE DEVELOPMENT AND TIPS/TRICKS

Andreas Schweizer
Switzerland

A-1599 SCAPHOID CASES 3D BASED VS FREE HAND WITH EMPHASIS ON GUIDE DEVELOPMENT AND TIPS/TRICKS

Jan Ten Bosch
The Netherlands

A-1600 DISTAL RADIUS WITH CONVENTIONAL PLATE WITH TRICKS LIKE BENDING WEDGES ETC VS PATIENT SPECIFIC PLATE (PSP)

Alex Berenguer
Spain

A-1601 DISTAL RADIUS WITH CONVENTIONAL PLATE WITH TRICKS LIKE BENDING WEDGES ETC VS PATIENT SPECIFIC PLATE (PSP)

Jean-Yves Beaulieu
Switzerland

A-1602 METACARPAL OR PHALANX MALUNION: 3D CORRECTION: PLATE / INTRAMEDULLARY SCREW, REDUCTION GUIDE OR NOT ETC

Anne Vochteloo
The Netherlands

A-1603 METACARPAL OR PHALANX MALUNION: 3D CORRECTION: PLATE / INTRAMEDULLARY SCREW, REDUCTION GUIDE OR NOT ETC

Radek Kebrle
Czech Republic

A-1604 COMPLEX FOREARM CASE: CRAZY STUFF: SUPRISE US ALL!

Antoine Rocher

South Africa

A-1605 COMPLEX FOREARM CASE: CRAZY STUFF: SUPRISE US ALL!

Shai Luria

Israel

A-1606 CLIMATIC CRISIS: WHY SHOULD WE CARE ABOUT IN HEALTH CARE?

Robin Rieser

Switzerland

A-1607 ASSESSING SUSTAINABILITY AWARENESS IN HAND SURGERY AND THERAPY: A SWISS NATIONAL SURVEY

Matteo Malacrida

Switzerland

A-1608 TRANSITION OF THE HOSPITAL: A ROADMAP TO A SUSTAINABLE FUTURE

Sophie Meisser

Switzerland

A-1609 PRACTICAL SUSTAINABLE INSIGHTS: MEASURING SUSTAINABILITY IMPROVEMENTS IN A HAND SURGERY PRACTICE USING LIFE CYCLE ASSESSMENTS

Nicoline de Haas

The Netherlands

A-1610 THE ABSURDITY OF SINGLE PACKED ITEMS IN HANDSURGERY

Preetham Kodumuri

UK

A-1611 HOW A CIRCULAR ECONOMY CAN CHANGE THE DAILY LIFE IN THE OR

Cedric Gysel

Switzerland

A-1612 PODIUMS DISCUSSION WITH ALL SPEAKERS

Maddalena Bertolini

A-1613 WELCOME & SESSION OBJECTIVES

Brigitte van der Heijden, Alex Lluch, Philipp Honigmann

The Netherlands, Spain, Switzerland

A-1614 BACK TO THE FUTURE: WRIST KINEMATICS FACTS OR FICTION

Brigitte van der Heijden, Alex Lluch

The Netherlands, Spain

A-1615 DOES MY CT SCANNER MEET THE REQUIREMENTS FOR 4D-CT?

Geert Streekstra

The Netherlands

A-1616 IMAGE ACQUISITION INCL. CONTRALATERAL SCAN FOR REFERENCE

Maranda Haenen

The Netherlands

A-1617 FROM RAW DATA TO RESULTS – DATA PROCESSING & INTERPRETATION

Iwan Dobbe

The Netherlands

A-1618 IS THERE A DIFFERENCE IN WRIST KINEMATICS BETWEEN LUNATE TYPE I AND II

Erin Teule

The Netherlands

A-1619 SCAPHOLUNATE AND LUNOTRIQUETRAL INJURIES – DYNAMIC INSTABILITY REVEALED

Melanaie Amarasooriya

A-1620 KINEMATICS IN PERILIUNATE INJURIES

Mathias Häfeli

Switzerland

A-1621 SCAPHOID NON-UNION – KINEMATIC CONSEQUENCES

Marieke de Roo

The Netherlands

A-1622 KINEMATICS AFTER PROSTHETIC REPLACEMENT: DRUJ, SCAPHOID AND LUNATE

Joris Oonk

The Netherlands

A-1623 GETTING STARTED: HOW TO BUILD SUPPORT (AND AVOID STARTING ALONE)

Robert Gvozdenovic

Denmark

A-1624 PANEL CASES. STARTING WITHOUT SUPPORT: WHAT HAPPENS IN REAL LIFE? WHAT WOULD I NOT DO AGAIN WHEN STARTING?

Maria Alejandra Ferrando Fons

A-1625 PANEL CASES. STARTING WITHOUT SUPPORT: WHAT HAPPENS IN REAL LIFE? WHAT WOULD I NOT DO AGAIN WHEN STARTING?

Matthew Brown

UK

A-1626 PANEL CASES. STARTING WITHOUT SUPPORT: WHAT HAPPENS IN REAL LIFE? WHAT WOULD I NOT DO AGAIN WHEN STARTING?

Joanna Kot
Poland

A-1627 DISTAL RADIUS FRACTURE: AVOIDING COMPLICATIONS AND COMPLEX FRACTURE MANAGEMENT

Rohit Arora, Simonetta Odella, Silvio Tocco
Austria, Italy, Italy

A-1630 SYNDACTYL: CURRENT CONCEPTS AND SOLUTIONS

Christina Lipede, Ireneusz Walaszek, Silvio Tocco
UK, Poland, Italy

A-1633 ULTRASOUND IN HAND SURGERY: CURRENT POSSIBILITIES AND APPLICATIONS IN HAND SURGERY AND REHABILITATION - LIVE PRESENTATION

Xavier Gueffier, Sebastian Kluge, Tom Lattrè
France, Switzerland, Belgium

A-1636 KIENBOCK'S DISEASE: FROM DIAGNOSIS TO CONSERVATIVE, OPEN AND ARTHROSCOPIC TECHNIQUES, HOW TREATMENT REFLECTS STAGING.

Mathias Häfeli, Daniel Vilcioiu, Tom Lattrè
Switzerland, Romania, Belgium

A-1639 PIP ARTHROPLASTY: INDICATIONS, COMPLICATIONS, PEARLS AND PITFALLS

Nico Schwalfenberg, Lauren Uppal, Silvio Tocco
Germany, UK, Italy

A-1642 TENDON SUTURING

Ana Pinto
Portugal

A-1643 TENDON SUTURING

Ana Pinto

Portugal

A-1644 NERVE EXAMINATION

Joaquim Casañas

Spain

A-1645 GRIP CONSTRUCTION IN CONGENITAL HAND ANOMALIES BEYOND MICROSURGICAL OPTIONS

Chiara Novelli

Italy

A-1646 CMX PATIENT SPECIFIC WRIST PLATE

Neal Ormsby

UK

A-1647 CMX PATIENT SPECIFIC METACARPAL PLATE

Dominique Merky

Switzerland

A-1648 BALANCE OR BIAS? PLATE VS. INTRAMEDULLARY SCREW FIXATION IN MODERN HAND SURGERY

Elisabet Hagert, Maurizio Calcagni, Radek Kebrle

Qatar, Switzerland, Czech Republic

A-1649 INTRODUCTION: FRÉDÉRIC SCHUIND

Brussels

A-1650 FROM 0 TO 1 TO 100 INCISIONLESS CARPAL TUNNEL AND TRIGGER FINGER SONOSURGERIES. THE GENEVA EXPERIENCE

Flavien Mauler

Italy

A-1651 NOVEL INCISIONLESS ULTRASOUND-GUIDED CARPAL TUNNEL AND A1 PULLEY RELEASE. PROSPECTIVE MULTICENTER UK STUDY

Nick Riley, Chris Little

UK

A-1652 BELGIAN EXPERIENCE. PROSPECTIVE REGISTRY OF PERCUTANEOUS CARPAL TUNNEL AND TRIGGER FINGER SURGERIES. TIPS AND TRICKS FROM THE INVENTOR

Fabian Mounongo

Belgium

A-1653 THE PERCUTANEOUS PARADIGM. CLINICAL REALITIES AND OPERATIONAL BOTTLENECKS OF ULTRASOUND GUIDED HAND SURGERY

Edan Manos

Germany

A-1654 BALANCING COST, CARBON, AND CARE. OUTPATIENT SONO-SURGERY FOR CARPAL TUNNEL IN A SEE-AND-TREAT PATHWAY

Suddhajit Sen

Dundee

A-1655 INTRODUCTION: YEHS COMMITTEE

A-1656 MANGLED HAND

Florian Früh

Switzerland

A-1657 DEVASCULARISED DIGIT

Pierluigi Tos

Italy

A-1658 COMPLEX ZONE 2 INJURY

Tomislav Palibrk

Serbia

A-1659 POST TRAUMATIC PIPJ STIFFNESS

Alistair Hunter

England

A-1660 SUMMARY + KEY MESSAGES

YEHS Committee

A-1661 EDITOR'S INTRODUCTION: JANE MCEACHAN

UK

A-1662 INTRODUCTION TO EDITOR'S CHOICE / TOP CITED PAPER SESSION

Henk Coert

Netherlands

A-1663 INTRODUCTION TO EDITOR'S CHOICE PAPERS

Tim Hems

UK

A-1664 HYPERSELECTIVE NEURECTOMY FOR THE TREATMENT OF UPPER LIMB SPASTICITY: A LONG-TERM FOLLOW-UP

Caroline Leclercq

France

A-1665 THE RISK OF SURGICAL SITE INFECTION FOR HAND TRAUMA SURGERY PERFORMED OUTSIDE MAIN THEATRES: A SYSTEMATIC REVIEW AND META-ANALYSIS

Shiraz Shafi

UK

A-1666 INTRINSIC NEONATAL LIMB ISCHAEMIA: A SYSTEMATIC REVIEW

Andrea Jester

UK

A-1667 BUDDY TAPING AFTER REDUCTION OF DISPLACED EXTRA-ARTICULAR PHALANGEAL FINGER FRACTURES IN CHILDREN: A RANDOMIZED CONTROLLED TRIAL

Daniel Weber

Switzerland

A-1668 HEALING AFTER BRUNER AND MCCASH INCISIONS FOR LIMITED FASCIECTOMY IN PATIENTS WITH DUPUYTREN'S DISEASE: A RANDOMIZED CLINICAL TRIAL

Luiz Guilherme de Saboya Lenzi

Brazil

A-1669 THE NATURAL HISTORY OF PAEDIATRIC TRIGGER THUMBS. A PROSPECTIVE COHORT STUDY

Dawn Chia

Singapore

A-1670 THE IMPACT OF VIRTUAL REALITY ON PATIENT EXPERIENCE DURING WIDE-AWAKE SURGERY: A RANDOMIZED CONTROLLED TRIAL

Charles Day

USA

A-1671 REVISION OPTIONS FOR DISCONTINUED TRAPEZIOMETACARPAL ARTHROPLASTIES: COMPATIBILITY WITH CURRENTLY AVAILABLE IMPLANTS

Pieter Vandenbeeke

South Africa

A-1672 CREATING A COMMON SCALE FOR THE CONVERSION OF QDASH AND PRWHE SCORES

Mary Harvey

UK

A-1673 UK HAND AND UPPER LIMB TRANSPLANT SERVICE, FUNCTIONAL OUTCOMES OF THE FIRST SIX PATIENTS:
A CASE SERIES
David Leonard
UK

A-1674 INTRODUCTION TO JHSE TOP CITED PAPERS
Nadine Hollevoet
Belgium

A-1675 COMPLICATION RATES AND MODES OF SHORT AND MEDIUM-TERM FAILURE IN MOTEC TOTAL WRIST
ARTHROPLASTY: AN INTERNATIONAL COHORT STUDY
Daniel Brown
UK

A-1676 IN-HOUSE 3D-PRINTED CUSTOM SPLINTS FOR NON-OPERATIVE TREATMENT OF DISTAL RADIAL FRACTURES:
A RANDOMIZED CONTROLLED TRIAL
Marco Keller
Switzerland

A-1677 DUAL MOBILITY PROSTHESIS FOR TRAPEZIOMETACARPAL OSTEOARTHRITIS: RESULTS FROM A PROSPECTIVE
STUDY OF 55 PROSTHESES
Benjamin Panzram
Germany

A-1678 VASCULARIZED VERSUS NON-VASCULARIZED BONE GRAFTING FOR SCAPHOID NONUNION WITHOUT
AVASCULAR NECROSIS: A RANDOMIZED CLINICAL TRIAL
Ruby Grewal
Canada

A-1679 TRAUMATIC BRACHIAL PLEXUS INJURIES: A NATIONAL REVIEW OF EPIDEMIOLOGY IN THE SCOTTISH
POPULATION OVER A 10-YEAR PERIOD
Tim Hems
UK

A-1680 TOTAL JOINT ARTHROPLASTY VERSUS TRAPEZIECTOMY IN THE TREATMENT OF TRAPEZIOMETACARPAL JOINT ARTHRITIS: A RANDOMIZED CONTROLLED TRIAL

Tjeerd de Jong
Netherlands

A-1681 THREE-DIMENSIONAL PRINTED CUSTOMIZED VERSUS CONVENTIONAL PLASTER BRACE FOR TRAPEZIOMETACARPAL OSTEOARTHRITIS: A RANDOMIZED CONTROLLED CROSSOVER TRIAL

Gerald Kraan
Netherlands

A-1682 MANAGEMENT OF THE CAPSULE IN TRAPEZIOMETACARPAL JOINT IMPLANT ARTHROPLASTY: RESECTION VERSUS REPAIR. SHORT-TERM RECOVERY AFTER IMPLANT VERSUS RESECTION ARTHROPLASTY IN TRAPEZIOMETACARPAL JOINT OSTEOARTHRITIS. LOW COMPLICATION RATE AND HIGH IMPLANT SURVIVAL AT 2 YEARS AFTER TRAPEZIOMETACARPAL JOINT ARTHROPLASTY

Stephan Schindele
Switzerland

A-1683 INTRODUCTION TO FESSH RESEARCH SESSION

Henk Coert
Netherlands

A-1684 INTRODUCTION: ANNE VOCHTELOO, ANDREAS SCHWEIZER, ALEX BERENGUER, FREDERIK VERSTREKEN

A-1685 GUIDED REPAIR: WRIST DRILL GUIDE FOR ARTHROSCOPIC TREATMENT OF FOVEAL TFCC LESIONS

Sofie Goeminne
Belgium

A-1686 EARLY CLINICAL APPLICATIONS OF THE NANO SWIVELOCK FOR INTERNALBRACE AUGMENTATION IN HAND SURGERY

Alfonso Carlos Prada Cañizares
Spain

A-1687 MINI-KEYNOTE: THE HAZARD LANDSCAPE IN HAND & MICROSURGERY

Suddhajit Sen

UK

A-1688 PHYSICAL WELLBEING AND RADIATION HAZARDS IN FEMALE SURGEONS

Adeline Clement

UK

A-1689 ERGONOMICS THAT ACTUALLY WORK IN THEATRE- PERSPECTIVES OF A MUSICIAN SURGEON

Prash Jesudason

UK

A-1690 THE SUCCESS OF LONGEVITY- GROWTH MENTALITY AND PREVENTION OF BURNOUT

Adeline Clement

UK

A-1691 A COMPREHENSIVE SPECIALTY SPECIFIC PHYSICAL WORKOUT ROUTINE

Suddhajit Sen

UK

A-1692 PREPARATION IS EVERYTHING: HOW TO AVOID CHAOS IN YOUR FIRST CASES

Lucian Lior Marcovici

A-1693 PANEL CASES. MY FIRST CASE THAT WENT WRONG: WHAT I LEARNED? WHAT IS THE ONE THING I ALWAYS PREPARE NOW...THAT I DIDN'T BEFORE?

Carlos Morales

A-1694 PANEL CASES. MY FIRST CASE THAT WENT WRONG: WHAT I LEARNED? WHAT IS THE ONE THING I ALWAYS PREPARE NOW...THAT I DIDN'T BEFORE?

Asgeir Amundsen

A-1695 PANEL CASES. MY FIRST CASE THAT WENT WRONG: WHAT I LEARNED? WHAT IS THE ONE THING I ALWAYS PREPARE NOW...THAT I DIDN'T BEFORE?

Maria Larrea-Zabalo

Spain

A-1696 SEEING OR GUESSING? THE BIGGEST CHALLENGE IN EARLY ARTHROSCOPY: NORMAL OR PATHOLOGY?

Chul Ki Goorens

A-1697 PANEL CASES. NORMAL OR PATHOLOGY? THESE ARE THE 2 IMAGES THAT I WAS MISINTERPRETING

Gonzalo Pintado

A-1698 PANEL CASES. NORMAL OR PATHOLOGY? THESE ARE THE 2 IMAGES THAT I WAS MISINTERPRETING

Ivan Tami

Switzerland

A-1699 PANEL CASES. NORMAL OR PATHOLOGY? THESE ARE THE 2 IMAGES THAT I WAS MISINTERPRETING

Antoaneta Stoimenova

A-1700 GANGLION RESECTION: WHAT SEEMS SIMPLE... ISN'T ALWAYS

Pedro Delgado

Spain

A-1701 PANEL DISCUSSION- GANGLION: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Lucian Lior Marcovici

A-1702 PANEL DISCUSSION- GANGLION: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Sergio Pombo

A-1703 PANEL DISCUSSION- GANGLION: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Gustavo Mantovani

A-1704 TFCC FOVEAL REPAIR: WHAT SEEMS SIMPLE... ISN'T ALWAYS

Eva Maria Baur

A-1705 PANEL DISCUSSION- TFCC FOVEAL REPAIR: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Andrew Chin

A-1706 PANEL DISCUSSION- TFCC FOVEAL REPAIR: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Jane Messina

Italy

A-1707 PANEL DISCUSSION- TFCC FOVEAL REPAIR: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Ana Scott-Tenent

A-1708 ARTHROSCOPY IN DISTAL RADIUS FRACTURES (DRF): ADDED VALUE OR ADDED COMPLEXITY?

Vicente Carratalá

A-1709 PANEL DISCUSSION- DRF: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Belén García-Medrano

A-1710 PANEL DISCUSSION- DRF: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Katerina Kasapinova

A-1711 PANEL DISCUSSION- DRF: MY REAL CASE-MISTAKE: WHAT HAVE I LEARNED FROM IT?

Enrico Carità

Italy

A-1712 SCAPHOLUNATE RECONSTRUCTION (SLL): WHEN RECONSTRUCTION FAILS BEFORE IT STARTS

Riccardo Luchetti

A-1713 PANEL DISCUSSION- SLL: MY REAL SLL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT?

Alfonso Carlos Prada Cañizares

Spain

A-1714 PANEL DISCUSSION- SLL: MY REAL SLL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT?

Mireia Esplugas

Spain

A-1715 PANEL DISCUSSION- SLL: MY REAL SLL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT?

Martin Caloia

A-1716 SCAPHOLUNATE REINFORCEMENT (SLL): TOO MANY TECHNIQUES, NOT ENOUGH CLARITY: HOW TO STAY FOCUSED?

Steven Moran

A-1717 PANEL DISCUSSION- SLL: MY REAL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT?

Jaime Sanchez Ruas

A-1718 PANEL DISCUSSION- SLL: MY REAL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT?

Maryam Wickert

Germany

A-1719 PANEL DISCUSSION- SLL: MY REAL CASE-FAILURE: WHAT HAVE I LEARNED FROM IT

Andrea Atzei

Italy

A-1720 KEYNOTE PRESENTATION - DRIP TRIAL

Markus Pääkkönen

Finland

A-1721 SHARK TANK SESSION OPENING, INTRODUCTION OF LAST YEAR'S WINNERS

Leila Harhaus, Judit Hetthéssy

Germany, Hungary

A-1722 2025 WINNER 3RD PLACE - 3D REALITY APPLE VISION PRO

Xavier Gueffier

France

A-1723 2025 WINNER 2ND PLACE - NEXT-GENERATION RADIOGRAPHIC EVALUATION IN HAND SURGERY: ARTIFICIAL-INTELLIGENCE TOOLS FOR CMC I OA –

Luca Häfliger

Switzerland

A-1724 2025 WINNER 1ST PLACE - BURNING HAND

Cosima Prahm

Germany

A-1725 ANNOUNCE TO START THE COMPETITION, INTRODUCTION OF THE SHARKS

Leila Harhaus, Judit Hetthéssy

Germany, Hungary

A-1726 HANDSHAKE: AI ENABLED PLATFORM FOR EARLY CRPS DETECTION AND MANAGEMENT

Leo Gundle

UK

A-1727 REDEFINING OUTCOMES IN HAND SURGERY

Malek Racy

UK

A-1728 BEE-BLIP: AUTOMATIC BONE HOLE DEPTH MEASUREMENT

Thomas Giesen

Switzerland

A-1729 THE SMARTCUBE: A SENSORY AND MOTOR REHABILITATION DEVICE

Adam Stoneham

UK

A-1730 INTRODUCTION OF FESSH RESEARCH GRANTS

Leila Harhaus

Germany

A-1731 IMPACT OF PRE-FIXATION STORAGE CONDITIONS ON HISTOLOGICAL INTEGRITY OF HUMAN VASCULARIZED COMPOSITE TISSUES – BASIC GRANT WINNER 2026

Turkhan Mehdiyev

Austria

A-1732 DEVELOPMENT, IN-VITRO AND IN-VIVO EVALUATION OF LM11A-31 CONTAINING LIPIDIC MESOPHASES AS ADJUNCT THERAPY TO MICROSURGICAL PERIPHERAL NERVE REPAIR –BASIC GRANT WINNER 2025

Rémy Liechti
Switzerland

A-1733 WRIST-(O)ATLAS: WRIST RECONSTRUCTION WITH INDIVIDUALIZED SCULPTED TRANSPLANTS – OSTEOCHONDRAL AUTOLOGOUS TISSUE LINEATION ALIGNMENT STUDY - CLINICAL GRANT WINNER 2026

Marijn Hameeteman
The Netherlands

A-1734 ANNOUNCEMENT OF THE 2025 SHARK TANK WINNERS

Leila Harhaus, Johannes Winker, Michael Martin
Germany

A-1735 REALTIME-MRI OF THE DISTAL RADIOULNAR JOINT (DRUJ) A NOVEL TECHNIQUE FOR DETECTION OF DRUJ INSTABILITY

Hauke Rüther
Germany

A-1736 WELCOME AND OPENING REMARKS

Andrea Atzei
Italy

A-1737 PRESIDENTIAL REPORT

Mireia Esplugas
Spain

A-1738 FINANCIAL REPORT

Marco Guidi

A-1739 RELATIONSHIP COMMITTEE UPDATE

Asgeir Amundsen

A-1740 RESEARCH COMMITTEE UPDATE

Robert Gvozdenovic

A-1741 EDUCATION COMMITTEE UPDATE

Vicente Carratalà

A-1742 YOUNG EWA COMMITTEE UPDATE

Chul Ki Goorens

A-1743 COMMUNICATION COMMITTEE UPDATE

Lucian Lior Marcovici

Italy

A-1744 CLOSING REMARKS

Andrea Atzei

Italy

A-1745 WRIST EXAMINATION WORKSHOP

Radek Kebrle, Carlos Heras-Palou, Alex Lluch, Maria Larrea-Zabalo

Czech Republic, UK, Spain

A-1746 WELCOME AND OPENING OF THE CEREMONY BY THE FESSH PRESIDENT

Brigitte van der Heijden

the Netherlands

A-1747 WELCOME AND OPENING OF THE CONGRESS BY EFSHT PRESIDENT

Marianne von Haller

A-1748 BALANCE (VIDEO)

A-1749 FESSH CONGRESS CO-PRESIDENTS ADDRESS

Philipp Honigmann, Esther Vögelin, Marianne von Haller, Patricia Kammermann

A-1751 VIDEO MESSAGE

A-1752 ADDRESS BY THE PRESIDENT OF THE SWISS SOCIETY OF HANDSURGERY AND HANDREHABILITATION

Torsten Franz, Ursula Osterwalder

A-1754 ADDRESS BY FESSH PRESIDENT ELECT

Zaf Naqui

A-1755 FESSH & EFSHT SCIENTIFIC COMMITTEE'S GREETING

Piotr Czarnecki, Vera Beckmann-Fries

A-1756 GIANTS OF HAND SURGERY CEREMONY

Zaf Naqui

A-1758 PANEL DISCUSSION

Yara van Kooij

A-1759 RESULTS OF THE SURVEY AMONG THE MEMBERS OF THE SIG

Miryam. C. Obdeijn

The Netherlands

A-1760 DELPHI ROUND ON OUTCOME MEASURES

Sara Dorman

UK

A-1761 ANATOMICAL AND FUNCTIONAL CONSIDERATIONS AROUND THE THUMB

Miryam Obdeijn

The Netherlands

A-1762 REBALANCING THE THUMB – A PRACTICAL APPROACH

Karin Boer

The Netherlands

A-1763 CASE DISCUSSION

Petros Mikalef

UK

A-1764 RESEARCH FELLOW 2026- PRESENTATION

Macarena Vizcay

Italy

A-1765 RESEARCH FELLOW 2026-PRESENTATION

Christos Nikolaos Sarigiannis

Sweden

A-1766 PROXIMAL STABILITY FOR DISTAL MOBILITY: SHOULDER BENCHMARKS FOR FUNCTIONAL MOVEMENT IN SPACE

Bettina Haupt-Bertschy

Switzerland

A-1767 MEDARTIS CMX WORKSHOP INSTRUCTIONS

Shane Feng

A-1768 NERVE EXAMINATION WORKSHOP

Janina Turon

Spain

A-1769 NERVE EXAMINATION WORKSHOP

Sebastian Kluge

Switzerland

A-1770 OPENING MESSAGE

Petra Stute

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