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Abstract Supplement

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Hand and Upper Extremity Surgery

Oral Presentations

(OP 01 - OP 94)

OP-01

Treatment of pediatric scaphoid nonunion with the ipsilateral radius graft and headless screw

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This study concerns pediatric scaphoid non-union, a very rare entity, for which surgical treatment remains controversial. This injury is rare, but several therapeutic methods have been described. Despite these reports, confusion persists due to the variety of methods of harvesting the autologous graft and of fixing materials. This case series concerns ipsilateral autologous radius graft and headless compression screw fixation in three children diagnosed with pediatric scaphoid nonunion. Nonunions healed uneventfully. All patients showed

excellent and good outcomes according to Modified Mayo Wrist Score. This method appears to be useful and sufficient with both graft harvest and fixation through a single incision. The patient is thus protected against secondary morbidities deriving from iliac crest grafting.

OP-02

Is physical examination sufficient to diagnose occult ganglion?

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Objective: Occult ganglion cysts of the wrist is the cause of chronic wrist pain which is common in orthopedics and traumatology outpatient clinics. The diagnosis is usually made by physical examination. Hidden ganglion should be suspected in patients with chronic

pain ailment in the wrist dorsoradial, patients with no trauma history, and normal radiographs. In this study, we aimed to compare the efficacy of ultrasound (USG), magnetic resonance imaging (MRI) and physical examination used in occult ganglion diagnosis compared to histopathological examination, which is definitive diagnosis.

Material-Method: There were 36 patients who referred to our outpatient clinic between 2013-2017, who did not respond to conservative treatment and had a histopathological diagnosis of occult ganglion. The physical examinations, USG and MRI images and pathologic results of these patients were retrospectively screened. On physical examination, a patient-specific finger extension test was performed for patients with a pain on the dorsal scapholunate joint. USG and MRI were taken to support the diagnosis. All patients underwent surgery accompanied by pneumatic tourniquet under axillary block using dorsal incision. The material taken in the operation was sent to the histopathological study. Histopathological reports were accepted as definitive and they were compared.

Findings: Histopathologically, there were 36 patients who had occult ganglion. When the results of MRI, USG and physical examination were examined, sensitivity was in a nature that will support diagnosis in a rate of 97%, 67%, 89%, respectively. The specific finger extension test performed was positive in 32 patients (89%) and all patients had sensitivity on the dorsal scapholunate joint. The mean age of the patients was 33 (15-51), 33 of the patients were female, and 3 were male. Complaints of 30 patients were in the dominant hand.

Result: There is debate as to whether ganglion cysts are the result of scapholunate ligament degeneration. In the differential diagnosis, Kienböck's disease, dorsal tenosynovitis, scapholunate dissociation are the main reasons that should be considered. - In the case of occult ganglion, despite the fact that it helps diagnosis, USG is not enough to make a definite diagnosis. We think that physical examination is enough to diagnose occult ganglion but MRI can be taken instead of USG to support the diagnosis in cases of contradiction.

OP-03

Short term results of extensor carpi radialis longus tendon ball interposition arthroplasty for treatment of late stage Kienböck's disease

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Background: Treatment of late stage Kienböck's disease is still controversial. The aim of this study was to evaluate short term results of extensor carpi radialis longus (ECRL) tendon ball arthroplasty for treatment of late stage Kienböck's disease.

Methods: We retrospectively reviewed data of 19 patient suffering from Kienböck's treated with ECRL tendon ball arthroplasty. Patients clinical functions were assessed using grip strength, ROM of wrist, Quick DASH, Mayo wrist score VAS scores. Radiological examination was performed to assess carpal height ratio and progression of arthritis.

Results: The median follow up was 30 months (range, 12-36 months). Thirteen of patients (86,6%) were pain free. ROM of operated wrist was 71% of nonoperated side. Carpal height ratio was statistically significantly reduced compared with preoperative values. Mean Mayo wrist and Quick DASH score were 78 (range, 60-100) and 9.83 (range, 0-30). No further radiological progression of carpal arthritis observed in final radiographs.

Conclusions: We think ECRL tendon ball arthroplasty is a good option for treatment of late stage Kienböck's disease with low complication rate.

Key words: Lunatum, wrist, avascular necrosis, interposition arthroplasty

OP-04

A congenital disorder causing chronic pain at young adult's wrist: Bilateral os styloideum related bilateral carpal boss syndrome

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Objective: Os styloideum is an anatomic variation, encountered as accessory carpal bone, which is located between trapezoid, capitate, second and third metacarpal bones. Its injuries are described as a component of carpal boss syndrome. Here, we report a case of rarely seen os styloideum which was detected in carpal boss syndrome

Case Report: Twenty-one year old, female, university student was admitted upon complaints of wrist pain on the right side, which had been occurring after handwriting with extreme effort, intense as much as toothache, appearing once in a year, existing for a week in each time during last seven years. Physical examination revealed immobile, hard protuberance – 1 cm in diameter – at the level of third metacarpal base located in both wrists. Tenderness on and proximal to the protuberance of the right side was noticed. Wrist flexion was aggravating the pain. The patient was right-handed. AP and lateral views of the wrists were unremarkable with regard to carpal bone structure. Bony protrusion extending from the base of third metacarpal bone to capitate bone was detected in CT images of the right wrist. The shapes of os styloid and the defect in dorsal aspect of capitate bone were relevant. A mass corresponding to synovial cyst was detected. In CT images of left wrist, bony protuberance at radial side of third metacarpal base and capitate bone was present. Partially-fused, sclerotic-edged, separate os styloideum had been forming protuberance with the reciprocal radial part of metacarpal bone, containing articular surface, distal to capitate bone in sagittal views. Irregularity in carpometacarpal joint (CMJ), partial fusion between trapezoid and capitate bones were noticed. Since carpal bosses and ganglion were diagnosed, analgesic medication and bracing were applied. The pain had vanished at the end of first month of treatment. The patient was pain-free at sixth month as well.

Conclusion: Carpal boss is defined as bony protuberance in second and/or third CMJs. Etiological classification suggests carpal bosses as acquired (exophytic), congenital (os styloideum) or mixed types. The disorder may develop due to carpal coalition. Seldom seen as isolated (2%), os styloideum is frequently detected

as fused with second or third metacarpal bones (94%), capitate bone (3.5%) or trapezoid bone (0.5%). Tenosynovitis and synovial cysts may accompany the disorder. Radiological examinations provide accurate diagnosis. Fractures, arthrosis, exocytosis, osteochondroma, soft tissue and bone tumors should be considered in differential diagnosis. The treatment of os styloideum injury is initially nonoperative. In case of recurrent pain despite rest and medication, operative treatment can be concerned in the management. The case presented in this study was informed on preventive measures. Nonoperative treatment achieved favorable outcome in short term.

OP-05

Ischemic extensor pollicis longus tendon rupture after distal radius fracture treatment

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Objective: In this case report we aimed to discuss possible etiologic factors in the treatment of ischemic extensor pollicis longus (EPL) rupture after distal radius fracture treatment and to evaluate the outcome of transfer of the extensor indicis proprius (EIP) tendon to the EPL.

Case: A 43-year-old male patient was admitted to the emergency department with fall from high ground. He had multiple rib fracture, clavicle fracture, scapula fracture and distal radius fracture. Patient was admitted to intensive care unit with chest tube. Osteosynthesis was applied with a locked anatomic volar distal radius plate at the second day of trauma. Postoperative hand and finger movements were normal. Short arm splint applied for healing of soft tissue damage and active range of motion exercises was started 2 weeks after the surgery. After 6 weeks postoperatively the patient's complaints of not being able to lift his thumb. In ultrasound edema and thickening around the EPL tendon was found. The patient's MRI and CT scans results showed that EPL was intact and that the screws placements and length were normal. Based on the clinical examination, EPL rupture was considered and the patient was scheduled for surgery at the 3 months post-

operatively. During the operation EPL tendon color changed and tendon structure lost about 8 cm. The necrosis was debrided. EIP transferred EPL pulvertaft method. Postoperatively, a short arm cast applied for 4 weeks. At 6 months postoperatively, finger movements were normal and painless.

Conclusion: To explain the mechanism of EPL tendon rupture after fixation with a volar plate, many reasons such as callus irritation, screw irritation and tendon injury during surgery have been sustained. However, in our case, we are considering the rupture of the tendon due to ischemic necrosis with the effect of inflammatory processes due to mutipl trauma. We report that the most appropriate reconstruction option is EIP tendon transfer in order to provide thumb extension in cases of defective EPL rupture.

OP-06

Scaphocapitate arthrodesis results in the treatment of stage 3B Kienböck's disease

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Introduction: In the advanced stages of Kienböck's disease, carpal malalignment and arthritis occur. In stage 3B Kienböck's disease, scaphocapitate arthrodesis aims to maintain carpal height with correction of scaphoid alignment. Scaphocapitate arthrodesis helps increase wrist function by reducing pain.

Aim: We aimed to analyze clinical and radiological results of scaphocapitate arthrodesis in stage 3B Kienböck's disease.

Methods: Fifteen patients (6 males, 9 females) who were diagnosed with stage 3B Kienböck's disease underwent scaphocapitate arthrodesis between the years 2012-2016 and were followed-up for at least 2 years were evaluated. The mean age was 35 years (Range: 24-53 years). Lunate excision was performed in 9 of the patients. Clinical analyses were made according to joint range of motion, grip strength and modified Mayo wrist scoring. Radiological results and complications were evaluated.

Results: After scaphocapitate arthrodesis, the angle

of flexion, radial and ulnar deviation was reduced. The grip strength and modified Mayo wrist score increased significantly after scaphocapitate arthrodesis. No serious complications such as persistent pain, nonunion or infection were observed.

Conclusions: After scaphocapitate arthrodesis painless and more functional wrist range of motion was obtained in stage 3B Kienböck's disease.

OP-07

Scaphotrapeziotrapezoid arthrodesis results in the treatment of stage 3B Kienböck's disease

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Introduction: Kienböck's disease (KD) presents itself with severe pain and decrease of wrist range of motion and strength. This pathological process in the lunate bone leads to fragmentation, carpal instability and carpal collapse over time. The scaphotrapeziotrapezoid arthrodesis fixes the radial column, corrects the carpal alignment, and shifts the axis of the load.

Aim: The aim of this study was to evaluate the clinical and radiological results of scaphotrapeziotrapezoid arthrodesis in stage 3B KD patients.

Methods: We evaluated 22 patients (12 males, 10 females) who underwent scaphotrapeziotrapezoid arthrodesis between the years 2012-2016 with stage 3B KD and were followed-up for at least 2 years in our hand surgery clinic. The mean age was 35 years (Range: 18-61 years). Clinical evaluations were made according to joint range of motion, grip strength and modified Mayo wrist scoring. Radiological results and complications were analyzed.

Results: Scaphotrapeziotrapezoid arthrodesis reduced the angle of flexion, radial and ulnar deviation. An increase in the extension angle was detected in 10 of the patients. The grip strength and wrist score increased significantly. We did not experience any serious complications such as persistent pain, nonunion or infection.

Conclusions: In the treatment of Kienböck's disease, successful clinical results, reduction of pain and functional recovery have been achieved with scapotrpezio-trapezoid arthrodesis.

OP-09

Hand injury after high pressure paint thinner injection

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Objective: Hand injuries with high pressure injection are rarely seen and do not take much attention by doctors. It's aimed to look at the approaches in hand injuries with high pressure injection by current information, to treat these injuries seriously by doctors and provide appropriate rehabilitation for restoring functions.

Case: The first case was a 54-years-old male patient who was admitted with a work accident, after the injection of high pressure paint thinner mixture to the right hand 3. proximal phalanx lateral site. Surgical was made debridement for cleansing the paint thinner and antibiotherapy was started. Following wound healing rehabilitation was started to gain finger movements. At the end of the third month, functions were achieved nearly almost.

The second case was 43 years old male patient with a work accident secondary to injection of a high pressure paint thinner mixture in the left hand 2. finger distal phalanx site surgical debridement for cleansing the paint thinner was made and antibiotherapy was started. At the end of the second week the patient's proximal region of distal phalanx underwent amputation because of gangrene and necrosis beginning at the end of the first week.

Conclusion: Hand injuries with high pressure injection are serious and irreversible accidents. Amputation rate is nearly up to 30%, this risk is greatly reduced by extensive surgical debridement in the first 6 hours. Significant aesthetic and functional sequels can occur according to the injected product and the injection site.

The success of the treatment depends on early surgical intervention, antibiotherapy and early rehabilitation.

OP-10

Are these factors such as age, gender, educational status, the way the event takes place, and the seasonal status of the fracture of the fifth metacarpal bone (Boxer's fracture)?

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Aim: We aimed to evaluate the effects of factors such as age, gender, educational status, the way the event occurred and the season in which fractures occurred in patients with fractures of the fifth metacarpal who were treated with conservatively, surgical or functional splint in our study

Material method: Twenty-one patients (19 males, 2 females) who were treated surgically or conservatively after the fifth metacarpal bone fracture were evaluated retrospectively. The mean age of the patients was 29.4 (19-48) and the mean follow-up period was 14 months. During the follow-up period of the patients, the educational status was analyzed according to factors such as the shape of the fracture, which hand was affected more frequently

Results: 11 of the 21 patients were dominantly affected by the right hand, 12 of the 21 patients were university graduates, 7 of them were high school students and 2 of them were primary school graduates. 21 of the 13 patients were punched in the wall, 5 of them were trapped in the door, it was observed that when the drops were seasonally evaluated, it was observed that 13 of the 21 patients were in the spring, 3 of them were in the summer, 3 of them were in the autumn, and 2 of them were in the winter.

Conclusion: It was concluded that patients with fractures of the fifth metacarpal bone who were treated surgically or conservatively were more likely to be university graduates, fracture formation as a result of more fist punching, more frequent men and seasonally in spring

OP-11

Treatment of Galeazzi fracture-dislocation with plate and endobutton

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Purpose: Galeazzi fracture-dislocation is the dislocation of the distal radioulnar joint with distal radial 1/3 fracture. Closed reduction and plaster fixation is usually inadequate in the treatment and surgical treatment is required. The distal radioulnar joint can be reduced after rigid fixation of the radial fracture. If distal radioulnar joint reduction is not stable, fixation with a K-wire can be performed. In this case, a patient with the fixation of the radioulnar joint using endobutton after the loss of reduction in the distal radioulnar joint following reduction of distal radius fracture is presented.

Case report: A 41-year-old female was admitted to a different emergency service with pain and limitation in the left wrist after falling, and closed reduction and splinting were applied (Figure 1). She admitted to our clinic on the 14th day after the fracture, and surgical treatment was recommended because of the loss of reduction. During the operation, the fracture at the distal radius was fixed with a plate via volar approach. However, distal radioulnar joint reduction was not stable. After the reduction of the joint, a tunnel was opened from the distal radius towards distal ulna and the joint was fixed with endobutton (Figure 2). No splinting was performed post-operatively and immediate wrist exercises were initiated. At post-op 6th week, the joint movements were painless and the same as the contralateral wrist and there were no limitation of movements.

Conclusions: Immobilization with plaster is not preferred in the treatment of Galeazzi fracture-dislocation due to the difficulty of keeping the reduction and the poor functional results. Compartment syndrome, neurovascular complications, infection, non-union, malunion, limitation of joint movements and weakening of hand functions can be seen after these fractures. Open reduction and fixation with a plate is preferred in treatment because of the stable fixation of the fracture fragments, the ability to initiate premature movements, no need for further splinting and the less loss of wrist movements. The results are excellent in many studies. Distal radioulnar joint is fixed with a K-wire following the plate fixation of the distal radius. There is no case in the literature where endobutton technique is used for the fixation of distal radioulnar joint. In our case,

the combination of plate and endobutton has been shown to have successful early clinical and functional outcomes.

OP-12

In the Humerus proximal fractured dislocations, our fixation results with an open reduction locking anatomical plaque screw

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Objective: Dislocations with shoulder fractures are cases rarely seen in the community compared to other fractures and challenging in terms of surgery. In our study, we evaluated the clinical and radiological results of patients who underwent open reduction and plaque screw fixation due to diagnosis of dislocations with shoulder fractures.

Material-Method: Between January 2009 and January 2016, 17 patients were included in the study because of dislocations with shoulder fractures at the Department of Orthopedics and Traumatology of the Dicle University Medical Faculty. Patients were divided into 2 groups according to age. Group 1 consisted of 6 patients over 65 years of age and the mean age was 77.5 (69-87). Group 2 consisted of 11 patients under 65 years of age and the mean age was 41.6 (24-60). The whole of Group 1 consisted of female patients and the whole of Group 2 consisted of male patients. Patients' referral charts were classified according to Neer Classification. In the clinical evaluation of the patients, Oxford Shoulder Scoring, DASH (Disability of the Arm, Shoulder and Hand) Score, and Constant Murley Scoring were used. Postoperative avascular necrosis staging of patients was performed according to Cruess Staging.

Findings: The mean follow-up period of the patients was 13.8 months (10-38). The mean duration of taking to surgery was 1,11 days (0-4). According to the Neer classification, the distribution of the cases was 11.8% of them were in two-part fracture dislocations, 64.7% in three-part fracture dislocations and 23.5% in four-part fracture dislocations. In the clinical outcome evaluation according to age groups, statistically significant difference was found in Oxford and DASH scores ($p=0,001$, $p=0,049$). The clinical outcomes of Group

2 were better than those of Group 1. In the follow-ups, avascular necrosis was observed in 14 of 17 patients (82.3%) at different stages. Distribution was in all patients in Group 1 and in a rate of 72.7% in Group 2 and. No additional complications such as wound infection or not setting were observed.

Result: In cases where humerus fractured rupture is accompanied by dislocation, whereas first choice in younger patients should be considered as open reduction and internal fixation, arthroplasty should be considered as well as internal fixation in elderly patients.

OP-13

Surgical treatment of isolated lunatum fracture non-union by percutaneous internal fixation-A case report

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Purpose: Lunatum fracture with perilunate instability is usually seen as wrist injuries. On the other hand, isolated lunatum fractures are rare. In this case report we would like to discuss the surgical treatment of isolated lunatum fracture non-union by percutaneous internal fixation.

Case Report: 36 years old male patient hit his volar aspect of his wrist while trying to open the door of a truck. Then he had wrist pain and went to a medical center where conservative treatment was applied related to soft tissue trauma. 45 days after the trauma he still had pain and came to our hospital. He had tenderness at lunatum by palpation. The dorsiflexion of the wrist was 10 degrees and palmar flexion was 20 degrees. At radiographic examination Teisen type 5 transvers lunatum fracture was diagnosed. For further evaluation and preoperative planning of the fracture CT scan was performed and non-union at the lunatum was diagnosed. Under regional anesthesia dorsal min-incision was made and percutaneous internal fixation with two headless 2,4x2,7 mm micro compression cannulated Acutrax screws was performed. Wrist range of motion (ROM) exercises were given two days after surgery. At the first month visit the patient was free of pain and had full wrist ROM. The fracture of the lunatum was radiologically healed completely at the sixth month visit.

Conclusion: A rare clinical hand trauma, fracture of isolated lunatum fracture nonunion, must be diagnosed by physical and radiological examination. Percutaneous internal fixation of the lunatum can be performed after evaluating the fracture type radiologically with good clinical results.

OP-14

Primary repair of failed mallet fingers with all soft suture anchor

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Introduction: Extension splints are often used for treatment of mallet finger but persistent lag of extension is not rarely seen after non surgical treatment. We evaluated surgical treatment of mallet finger by using all soft suture anchor which failed after conservative treatment and late diagnosis.

Materials and methods: From November 2014 to December 2016, 13 patients with chronic mallet finger injury were treated with open repair of extensor indicis tendon with all soft suture anchor.(JuggerKnot® Biomed Warszawa) There were 8 males and 5 females with mean age of 31,4 (range, 19 -45) years. None of the patients had acute injury. Six of thirteen were late diagnosed patients and seven patients had failed conservative treatment. All patients had open surgery for extensor tendon with all soft anchor. We evaluated last extensor lag and satisfaction of patients with Crawford classification.

Results: The mean follow up was 20,6 (range,12-36) months. Mean extensor lag before surgery was 27.2° (range 15°-35°), mean extensor lag after surgery was 3,2° (range, 0°-15°). One patient had fair, two patients had good and other patients had excellent results according to Crawford classification. There were two complications, one patient had soft tissue injury and other one had prolonged healing.

Conclusion: Extensor lag is one of the most annoying problem after mallet finger injuries of hand. Surgical treatment is an option for failed conservative treatment.

OP-15

Biomechanical comparison of conical compressive screw fixation efficiency in the fixation of distal radius fractures with plate + screw and k-wire fixation methods

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Objective: Distal radius fractures are an important type of fracture because of being encountered frequently and being closely related to the daily activity of the person. In addition to the large number of surgical treatment options, headless conical compressive screw fixation method percutaneously with closed reduction was considered to be a very effective method in terms of both providing a strong fixation, being low cost and patient comfort

Material - Method: In this study, non-articular radius distal end fractures were formed in the forearms of 63 sheep, and Plate + Screw fixation method and K-Wire fixation methods were applied in addition to the headless conical compression screw fixation method. When fixations were made, contact was planned to be provided during the volar cortex fixation when a 5 mm defect was created in the dorsal cortex. The fixation powers of all three groups were researched with detailed biomechanics and statistical data with the help of the Instron device. With the force applied to the fracture line, the detachment at the fracture line was automatically recorded by the device, being measured in millimeters with arithmetic and graphical values. Both dorsal and volar loadings were assessed using forces giving rise to 5mm displacement. SPSS program was used for statistical evaluation. Data were compared using the "Independent Sampling Test".

Findings: In dorsal loadings, conical compression screws were found to be superior compared to plate + screw and wire group ($p = 0.005$; $p = 0.001$). In the volar loadings, the fixation efficiency of the screw and plate-screw group was found to be similar, while both groups were superior to the wire group ($p = 0.508$; $p = 0.025$). In the case of 750 Newton axial loadings, the fixing efficiency of the screw and wire group was found to be similar but the fixing force of the plate + screw

group was observed to be weaker than the other two groups (screw / k - wire = 2.65 mm / 2.57 mm, $p = 0.846$; screw / plate + screw = 2.65 mm / 4.25 mm, $p = 0.017$).

Result: As a result of this biomechanical study that was made, conical compressive screw fixation method is considered to be a safe alternative method when used clinically with low complication rate which can allow for early rehabilitation, and which is cheap, practical and easy to apply in distal radius fractures.



Figure 1. Polyester embedded, ready to test material.



Figure 2. Test with Instron.

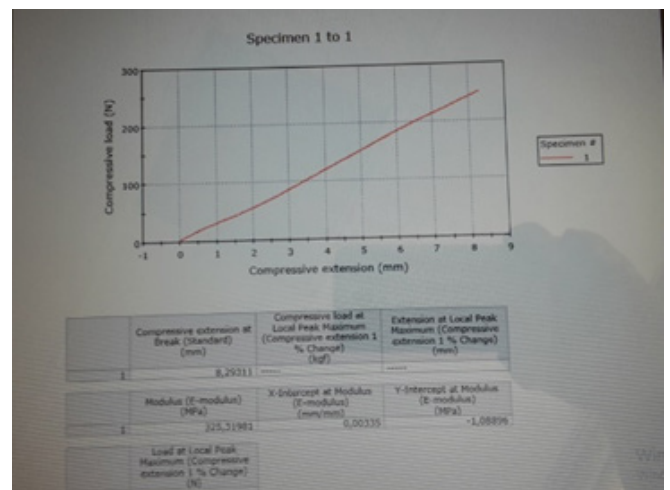


Figure 3. Instron Test Chart.

OP-16

Ulnar nerve entrapment due to Kirschner wire migration after supracondylar humerus fracture surgery and fast recovery: A case report

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Purpose: It has been known that medial kirschner (K) wire fixation for supracondylar humeral fractures carries ulnar nerve injury risk. We report a case that ulnar nerve was uninjured in the initial operation but entrapped by the migration of the K wire because of the late presentation for removal.

Case: A 7 years old male patient with supracondylar humeral fracture was operated and closed reduction, cross K wire fixation was performed. K wires were left out of the skin. Ulnar nerve examination was normal on the first postoperative day and the patient was discharged from hospital uneventfully. Afterwards, the patient did not come back for follow-up examinations because of health insurance problems. 3 months later the patient came for the first time. In this examination, it was detected that K wires were migrated subcutaneously. Ulnar nerve dysfunction was detected as clawing, adductor atrophy and numbness. Elbow range of motion was also restricted. Implant removal and ulnar nerve decompression was planned and the patient underwent surgery. Preoperatively ulnar nerve was explored and it was observed that the migrated K wire entrapped ulnar nerve. K wires removed and nerve decompression was performed. 2 weeks after the surgery it was observed that ulnar nerve functions were recovered completely and elbow range of motion was improved.

Conclusion: Removal of the K wires should not be delayed after supracondylar humeral fracture surgeries. We should keep in mind that unexpected complications may occur. In this particular case implant removal and nerve decompression provided dramatic improvement.

OP-17

Treatment of acute acromioclavicular joint dislocations with endobutton system: Radiologic and functional results

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Introduction: Acromioclavicular joint dislocation are the most commonly seen shoulder injuries in orthopedic practice. Rockwood is the most frequently used system in classification and treatment planning of these injuries. In general, Type 1 and Type 2 injuries are treated conservatively, while Type 4, Type 5, and Type 6 injuries are treated surgically. Treatment of Type 3 injuries is controversial in the literature. Among the surgical treatment options, the use of TightRope has become increasingly popular in recent years. The objective of this study was to evaluate postoperative radiologic and functional results of the high-type acute acromioclavicular joint dislocations that were treated with TightRope™ system.

Methods: The files of 19 patients who were diagnosed with high-type acromioclavicular joint dislocations and treated with ZipTight™ endobutton system between March 2015 and December 2016 were retrospectively reviewed. Shoulder scale by the University of California Los Angeles (UCLA) and visual analogue scale were used for the postoperative functional evaluation. Coracoclavicular distance and the reduction of acromioclavicular joint were evaluated preoperatively, and in the postoperative 6th week and 1st year, and compared with the healthy side.

Results: Of the 19 patients, 15 were male and 4 female. The mean age was found as 33.4 (range: 21 – 45) years. According to the Rockwood classification, 12 patients were defined as Type 3, 2 patients as Type 4, and 5 patients as Type 5. It was found on the radiography performed preoperatively and in the postoperative 6th week and 1st year that, the coracoclavicular distance and the reduction of acromioclavicular joint were sufficiently reduced (Figure 1). The mean UCLA shoulder score was found as 83.5 (80-89) in the operated shoulder, and 87 (84-93) in the healthy shoulder. Evaluating with UCLA shoulder score, no statistically significant difference was found between the shoulder with acromioclavicular joint dislocation and the normal shoulder.

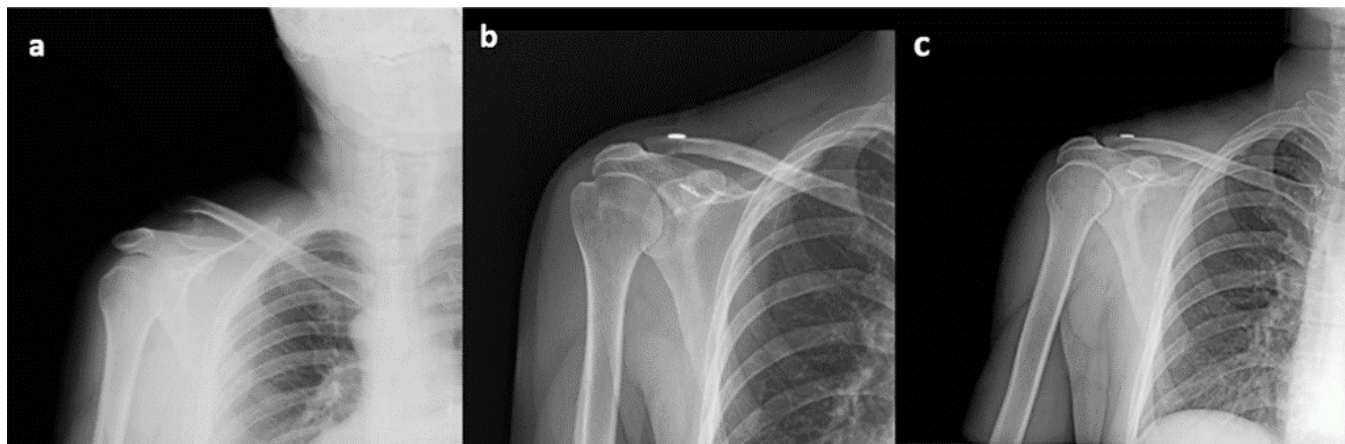


Figure 1. Acromioclavicular joint dislocation of Type 3 according to Rockwood classification, occurred in a 26-year-old male patient after falling on his right shoulder (a). Postoperatively, reduction of the acromioclavicular joint was achieved with ZipTight™ endobutton system (b). Joint reduction and coracoclavicular distance were preserved on 1st year follow-up radiograph (c).

Conclusion: ZipTight™ endobutton system is a safe and rigid fixation method providing high degree of patient satisfaction in surgical treatment of acute acromioclavicular joint dislocations.

OP-18

Reconstruction with hemi-hamate autograft in unstable dorsal PIP fractured dislocations, early results

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Introduction: PIP joint injuries vary in severity from simple trauma to intraarticular fracture outcome. Surgery is indicated in displaced and instable fractures. There is a direct relationship between fracture site proximal to middle phalanx and joint stability and 50% or more of the fracture area is considered instable. Anatomical reduction is essential to restore joint function and geometry. Hemi-hamate osteochondral autograft arthroplasty is a salvage procedure in cases of unsuccessful conservative or surgical treatment without screw reduction and k-wire reduction.

Purpose: We aimed to present our treatment results with hemi-hamate autograft in 4 cases with delayed and failed PIP fracture dislocation treatment.

Method: Four cases with hemi-hamate autograft applied between 2015-2017 in our clinic were included

in the study. 4 patients were male and the pathology was right. The mean age was 35.7 (30-46 years). The time it took for the cases to contact our clinic from the moment of trauma was 6 weeks. In the preoperative radiographs, the proximal phalanx fracture area was 52%. (%50-60) and in all cases the PIP joint was dislocated. Pre-operative range of motion was limited and painful. The grip strength was reduced. Autologous hemi-hamate osteochondral grafts were obtained from the distal dorsal area of the hamat for volar lip defects and applied to the defective area of proximal phalanx to rebuild the articular surface. The first week postoperatively was followed by static splint. Then the splint was removed and active action started.

Result: The average follow-up period after surgery was 12 months (4-24 month). The average flexion range of the PIP joint is 77.5 °(range 0°-100°). There was an average loss of 12.5 °(range 0°-20°) in the extension of the PIP joint. There was no instability in any cases. All patients had well graft fixation. In one case, the graft collapsed 1 mm towards the volar, but instability did not develop. Postoperative pain was experienced in the cases and the grip strength was recovered by 90% when compared with the other hand. All of the patients were satisfied with the functional outcome.

Conclusion: Reconstruction with hemi-hamate autograft is a good choice for instable PIP fracture dislocations, even though the PIP affects more than 50% of the articular surface of the middle phalanx at the fractured dislocations or with less joint involvement. This method restores the geometry of the PIP joint by recon-

structing the mid-phalangeal articulation face. It makes the joint stable and functional. Has low functional loss and complication rate compared to our experience.

OP-19

Local and distant pedicled flaps in upper extremity reconstruction

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Background: Defects in the upper extremity region usually occur after trauma and tumour excision. Skin grafts, local and distant pedicled flaps and free flaps can be used to repair these defects. The aim of this study is to compare the local and distant pedicled flaps used in the repair of upper extremity defects and to determine the factors that are important in choosing the correct method.

Materials and Methods: A total of 46 patients who were reconstructed with pedicled flaps for upper extremity defect in our clinic between 2012 and 2017 were included in this study. The mean age of the patients was 37.3, with 31 males and 15 females. In 27 of the patients the reason was tumour excision, while in 19 patients the cause was trauma.

Results: Thirty-seven of the defects were reconstructed with local pedicled flaps and nine with distal pedicled flaps. Among these flaps, 26 posterior interosseous artery flaps, 6 radial artery flaps, 5 ulnar artery flaps and 9 abdominal interpolating flaps were preferred. Partial necrosis was seen in 6 of the local flaps and no necrosis was seen in the patients treated with distant flaps. A second flap thinning operation was performed on 4 of the patients who underwent abdominal interpolation. Nine of the patients with posterior interosseous artery flaps had venous return problems. The mean follow-up duration of the patients was calculated as 7 months.

Conclusion: Pedicled flaps are frequently used in upper extremity reconstruction. Posterior interosseous artery flap is the first choice, especially after tumour excisions in the hand area. The problem of venous return is the biggest problem of this flap. Radial artery flap and ulnar artery are less preferred because of major artery sacrifice. Abdominal interpolation flaps should be considered as a good option when the forearm area is

in the trauma zone. The disadvantage of these flaps is that they require two to three operations such as flap thinning. These factors should be considered when choosing the most appropriate reconstruction method for the patient.

OP-20

Success and usability of magnetic resonance imaging (MRI) in the evaluation of collateral band and volar plaque injuries occurring in hand fingers

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Purpose: It has been shown that MRI has a high accuracy rate when evaluating the thumb metacarpophalangeal (MCF) joint collateral ligament injuries. In this study, we aimed to measure the success rate of MRI in assessing collateral ligament band and volar plate injuries with the thumb and other fingers.

Materials and methods: Twenty-three fingers of 22 patients who underwent complete collateral ligament injury were evaluated retrospectively. All patient's hand MRI's were taken preoperatively. Preoperative MRI findings were compared with those obtained during the operation.

Results: The patients were consisted of 11 men and women equally. The mean age was 43.50 (13-73) and the mean preoperative period was 46.5 (3-395 days). Right hands were affected in ten patients and left hands were affected in thirteen patients. 7 patient's thumb, 6 patient's ring finger, 5 patient's fifth finger, 4 patient's long finger, and 1 patient's index finger were injured. The ulnar collateral ligament (UCL) of 12 patients and the radial collateral ligament (RCL) of 11 patients were injured. Six patient's volar plate were damaged. All of the 7 patients with thumb injuries had the 100 % same preoperative and intraoperative findings in terms of collateral ligament injury MRI findings. Of the remaining 16 patients who underwent total collateral ligament injuries in the remaining 4 fingers, total ruptures were detected in 8 pre-operative MRI findings and partial tears were detected in the remaining 8 patients. In 8 pa-

tients who had pre-operative volar plate injury, only 3 of them had volar plate during the operation. In addition, total volar plate injuries were detected during the operation in 3 patients who had no volar plate injuries before the preoperative MR findings.

Discussion: In our study, MRI procedure was quite successful in accordance with the literature in evaluating the injury of the thumb MCP joint collateral ligament. In addition, the MRI evaluation of total collateral ligament injuries of the proximal interphalangeal joints of the other 4 fingers, total success ratio were found 50 % successful, 50% partially successful. MRI does not have sufficient sensitivity and specificity in detecting volar plaque injuries. In conclusion, patients history, injury mechanism and physical examination still remain important in the treatment of finger collateral ligament injuries.

OP-21

Extension-Block pinning to treat bony mallet finger: Is a transfixation pin necessary?

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Objective: Extension-block pinning is a popular treatment for mallet fractures, but it is associated with several pitfalls. Of note, transfixation Kirschner wires used to fix the distal interphalangeal (DIP) joint may cause iatrogenic nail bed injury, bone fragment rotation, chondral damage or osteoarthritis. We aimed to determine whether a transfixation pin was necessary for extension-block pinning in the treatment of bony mallet fracture.

Materials-Methods: Patients treated by our pin-orthosis extension-block technique were if they had been diagnosed with a type 4B mallet fracture according to Doyle's classification (Fig.1, Fig.2, Fig.3) Radiological outcomes were evaluated by postoperative

X-ray, and functional outcomes were evaluated using Crawford's criteria.

Results: Thirteen patients (nine males and four females) with a mean age of 26 years were included. The mean time between injury and surgery was 3.3 days, and the mean follow-up period was 8.2 months (range, 4–12 months). Radiographic bone union was achieved in all patients within an average of 5.1 weeks (range, 5–6 weeks). At the final follow-up, the DIP joint had an average degree of flexion of 76.1° (range, 65°–80°) and an average extension deficit of 3.84° (range, 0°–15°). Based on Crawford's criteria, eight patients had excellent results, four patients had good results and one patient had a fair result. No patient reported pain at the final follow-up.

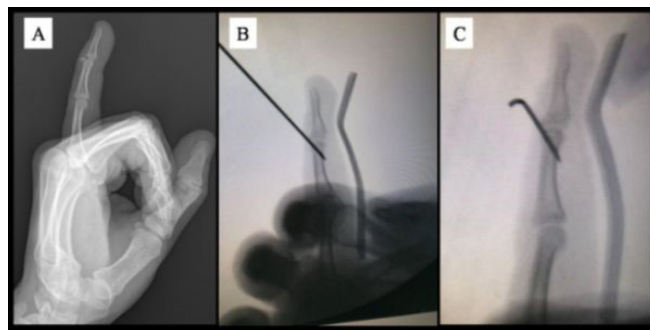


Figure 1. A 28-year-old male with a mallet fracture of the right little finger. (A) Preoperative lateral X-ray of a type-4B mallet fracture. (B) The 1.2-mm Kirschner wire was inserted just behind the fragment into the dorsal rim of the articular surface of the middle phalangeal head, at an angle of approximately 40°–45° relative to its longitudinal axis, and an aluminium orthotic device was applied. (C) Postoperative lateral view by fluoroscopy.



Figure 2. Clinical appearance after applying the aluminium orthotic device.

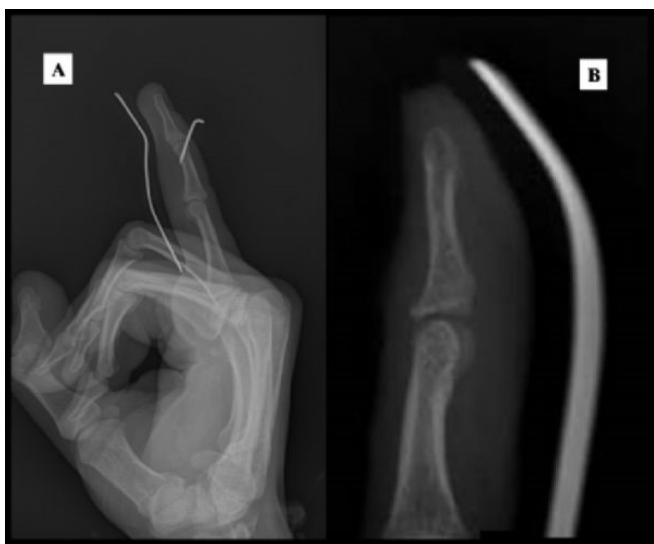


Figure 3. Early postoperative lateral X-ray view. (B) Lateral X-ray view after week 6, before the aluminium orthotic splint was removed.

Conclusion: Using our pin-orthosis extension-block technique, we obtained satisfactory clinical and radiological outcomes. Future prospective and randomised studies are justified to confirm the efficacy of this technique.

OP-22

Comparison of casting outcomes with a closed reduction and a closed reduction involving a percutaneous Kirschner wire insertion in patients with an extraarticular fracture of the first metacarpal base

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Objective: The present study aims to evaluate the functional and radiologic outcomes achieved from casting with a closed reduction and a closed reduction involving a percutaneous Kirschner wire (K wire) insertion in patients with an extraarticular fracture of the first metacarpal base.

Methods: A total of 26 patients (16 males, 10 females) who underwent treatment between June 2013 and

July 2015 were classified into two groups and evaluated retrospectively. The first group underwent a closed reduction with a percutaneous K wire insertion, while the second group underwent closed reduction and circular casting. The mean age of the patients was 34 years (20–48 years), and the mean follow-up duration was 14 months (8–20 months). Functional outcomes were evaluated based on the total active joint range of motion (TAJRM) scale, and the time to return work was compared between the two groups. Analyses were carried out using the Statistical Package for the Social Sciences (SPSS) program and a Friedman's p correlation test was used for comparisons. P values of <0.05 were considered statistically significant.

Results: According to the TAJRM scale, perfect and good outcomes were achieved in 22 and four patients, respectively, and total bone union was noted in all patients within an average duration of four (3–6) weeks. Radiological and functional outcomes were not significantly different between the two groups, although the time to return to work was significantly different in the first group ($p=0.03$). Complications such as infection, loss of reduction or Sudeck's atrophy were not noted in any of the patients.

Conclusion: While both treatment strategies provided satisfactory functional and radiological outcomes in patients with extraarticular fractures of the first metacarpal base, the outcomes in terms of time to return work were significantly different in those who were treated with a closed reduction and K wire insertion in this study.

OP-23

Comparison of functional results of radial head excision, radial head replacement and open reduction internal fixation in proximal radial fractures

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Objective: Radial head and neck fractures account for 4% of all fractures and 33% of elbow fractures. There

has been conflicting literature on treatment of these fractures with open reduction internal fixation (ORIF) and radial head replacement (RHR). Some surgeons advocate ORIF treatment while others RHR. RBP advocates have increased with the prostheses design suitable for biomechanics of the radial head. The aim of this study is to compare the clinical outcomes of different operative treatment methods in radial head and neck fractures.

Materials and Methods: A total of 47 patients treated with radial head and neck fracture in Orthopedics and Traumatology department, between 2010-2017 were reached from the document management system. Patients were invited to the clinic for evaluation and 28 patients treated with radial head excision (n=8), radial head replacement (n=10) or open reduction and internal fixation (n=10) were agreed to participate in the study. Demographic data and descriptive data on fracture type and profession were recorded. Visual analog scale (pain and patient satisfaction), elbow range of motion, grip strength, Disabilities of the Arm, Shoulder and Hand (DASH-T) questionnaire, Mayo Elbow score and Short-Form 36 (SF-36) were used to determine clinical outcomes. In addition, the surgical satisfaction of the patients was assessed with visual analog scale.

Results: There was no significant difference in clinical results between the the groups regarding the rest and activity pain level, elbow functional performance and the quality of life scores ($p>0.005$). Elbow flexion range of motion, grip strength and upper extremity functional performance were significantly better in patients treated with ORIF ($p<0.005$). Although there was no difference in patient satisfaction between the groups ($p>0.005$), the ORIF group had higher satisfaction score (ORIF group: $X\pm Ss=9.40\pm 1.57$, replacement group: $X\pm Ss=8.16\pm 2.72$, excision group: $X\pm Ss=7.31\pm 2.84$).

Conclusion: Different treatment methods can be used after radial head and neck fractures. In our study, we found that patients treated with ORIF had better results in terms of the upper extremity functional performance and the strength.

We found that ORIF is better than radial head replacement and excision in terms of the upper extremity functional performance and the strength in the treatment of radial head and neck fractures. However fur-

ther randomized control trials are needed to evaluate the full benefits and deficiencies of each of the different surgical treatment methods. We think that this condition should be taken into consideration when selection the surgery method for the elbow joint, which is very important in the upper extremity functioning and, further studies could be done in this regard.

OP-24

Treatment of scaphoid pseudo aneurysm with bony pronator muscle graft

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The scaphoid bone, which is among the bones with weak feeding in the body, is treated conservatively or surgically subsequent to being fractured after trauma. In some cases, it is seen that bone setting is not seen after treatment. In some cases, failure of setting of the bone is diagnosed with imaging systems after referring with pain without previously referring to the hospital after trauma.

After the diagnosis of scaphoid non-union with Graph was made, various surgical methods for bone union were defined once it was found that there was no avascularity by assessing the viability of the bone tissue with MRI.

In our study, we included two groups applied as bony pronator muscle grafts (Group 1) and free autograft (Group 2), which were 2 different methods used as grafts. 40 people aged 14-38 participated. (G1: 15 persons, G2: 25 persons) Groups were compared in terms of union time, pain, wrist ROM, grasping and pinch strength.

OP-25

A different treatment method for acute total ulnar collateral ligament injuries of thumb: Primary repair with Mini Soft Suture Anchor (JuggerKnot™)

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Introduction: Surgery is the primarily preferred treatment option for acute total ulnar collateral ligament (UCL) rupture. Previous studies have investigated the efficacies of different surgical methods such as indirect fixation with K wires and primary repair using pull out suture and classical metal-bioabsorbable anchors. In the present study we aimed to investigate the functional outcomes and complications of a new approach, the primary UCL repair using JuggerKnot soft Anchor-1.0 mm Mini (Zimmer-Biomet).

Method: This study included a total of 12 patients with acute UCL injury who were operated with primary repair with JuggerKnot™ Soft Anchor-1.0 mm Mini between January 2012 and September 2016. All patients were operated on using the same surgical technique. The thumb pinch and grip strengths, articular range of motion, and Glickel functional score were recorded for all patients. The pinch grip strength and articular range of motion were compared with the intact side. Early and late postoperative complications were recorded.

Results: The mean follow-up time was 22.2 months (range 6-54 months). The grip strength and the pinch strength were 94.3% and 92.27%, respectively, of the contralateral side. Articular range of motion attained the same level as the contralateral side in all patients at the final visit, and no patient suffered from any complication. The patients returned to work at a mean of 5.45 weeks, and the Glickel score was good in 1 patient and excellent in the remainder 11 patients.

Conclusion: Surgical repair using the JuggerKnot™ Soft Anchor-1.0 mm is an effective alternative treatment method for acute total UCL rupture.

OP-26

Fracture of hamatum associate with fourth metacarpal fracture and dislocation, report of 2 case

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Objective: Presentation of 2 fracture of the hamatum associate with fourth metacarpal fracture and disloca-

tion, which are uncommon and have various difficulties in fixation.

Case: Both of our cases were young male patient . Patients had severe swelling and loss of motion in the hand dorsum as a result of the punching of the wall They were referred to emergency unit. Although the pathology in ap / lateral and oblique radiographs is more or less understood, we consider computerized tomography in this type of injury to be important to find out what is encountered during fixation and which implants we were use. During operation soft tissue, tendon and superficial nerves were preserved and fracture fixed with a mini headless self-grooved cannulated screws. One patient fixation was supported with k- wire due to the loss of reduction of the fourth metacarpal dislocation after reduction and capsular repair. Active DIF, PIF movements were initiated on the 10th day of the post op . At the 4th week, the short arm splint was completely removed. There was no deformity and no loss of joint range of motion.after physical therapy and rehabilitation.

Conclusion: The screw size and length to be selected during fixation of the hamatum fracture is very important. Using a slightly larger screw may break up the hamatum, and using a long screw will result in injury to the ulnar nerve motor branch, which is in the immediate vicinity of the hook of hamatum.

OP-27

50 retrospective analysis of metacarpal fracture and postoperative long term assessment

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Objective: Metacarpal fractures account for 30 -40 % of all hand fractures. The 5th most commonly seen metacarpal fracture is the neck fracture. In this study, retrospective analysis of patients with metacarpal fractures was aimed.

Materials and Method: Patients who referred to Selçuk University Medical Faculty Plastic, Reconstructive and Aesthetic Surgery clinic between 2012 and

2017 were evaluated. Linear, non-articular patients who was referred to plastic surgery clinic, or patients who were referred to our clinic from the emergency Department were included in the study. Patients treated with a conservative method were excluded from the study. Age, sex, etiology, type of fracture, which metacarpal fracture, fracture site, treatment method, duration of recovery, complications of 41 patients were recorded.

Findings: The mean age of the 39 male 2 female patients was 29.36 (3 - 80). In total, 50 metacarpal fractures were detected (2 metacarpals in 7 patients, 3 metacarpals in 1 patient). 15 of all fractures were transverse, 32 were oblique fractures. Injury mechanism: 7 cases were in the form of pounding the wall with fists, 8 crushing - compression, 3 traffic accidents, 1 sports injury, 20 hitting and 2 pounding. 1 of the metacarpal fractures was in the first metacarpus, 4 were in the second, 8 were in the third, 15 were in the fourth, and 22 were the fifth metacarpus. 1 bacterial infection, 1 pain, 1 dislocation with pounding and 1 non-union were detected.

Result: Metacarpal fractures are manifested by direct or indirect mechanisms. The type of fracture or dislocation that occurred can vary depending on the nature and direction of the force applied during the trauma. Metacarpal fractures are most commonly seen on the 4th and 5th metacarpals and usually result in punching a hard object. In our study, 37 out of 50 fractures were seen in the 4th and 5th metacarpus and are compatible with the literature. Most metacarpal neck fractures are treated with conservative method. In our study, we attribute this to the fact that neck fractures are less detected. In literature, it has been shown that the comparison of conservative treatment with surgical treatment has no place in evidence-based medicine. Therefore, patients who were treated with conservative treatment were not included in our study.

In the sports literature, the multiple-part fracture of some of the metacarpals has been reported more frequently in the literature. In our study, the number of patients suffering from sports injuries is low because of the fact that multiple fractures are excluded and only linear fractures have been studied.

OP-28

Kirschner wire fixation results in unstable extra articular proximal phalanx fractures

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Objective: In this study, we aimed to present the radiological and clinical results of fixation of Kirschner wire we applied in proximal phalanx fractures showing no extension to the joint.

Material - Method: Clinical and radiological data of 16 patients to whom we applied closed reduction and fixation with Kirschner wire due to extra articular proximal phalanx fracture were retrospectively reviewed. Evaluation and statistical analysis was made to all patients based on postoperative 6th month evaluation parameters. Active and passive metacarpophalangeal joint and interphalangeal joint motion ranges, total joint range of motion, grip strength measurement for fractured and solid hands, visual analogue scoring for subjective pain assessment, Disabilities of the arm, shoulder and hand score for functional evaluation, distance measurement between pulp and palmar curve in the operated finger, Belsky score, reoperation and complications were evaluated.

Findings: Radiological union was obtained in an average of 4.8 (4 - 8) weeks. When the functional results of the patients are evaluated; active metacarpophalangeal joint flexion was assessed as 87.8 (60-90) degrees in average, proximal interphalangeal joint flexion was 77.5 (55-100) degrees in average, and distal interphalangeal joint flexion was 73.4 (60-90) degrees in average, average total joint motion range was assessed as 230 (170-270) degrees. In the hand with fracture, the grip strength was measured as 36 (23-50) kgW, and the comparison made in the robust hand was measured as 39.5 (30-50) kgW. There was no statistically significant difference found in terms of grip strength ($p < 0.05$). The visual analogue score average was assessed as 1.25 (0-5), Disabilities of the arm, shoulder and hand score average was 10.5 (2-34), the average distance between

the finger pulp and the finger curve was assessed as 6.25 (0-23) mm. in average.

Result: Proximal Phalanx is a cheap treatment method which is closed, extra articular, considered as closed reduction and fixation application with Kirschner wire in unstable fractures. It is a successful radiologic and functional method, especially in communicated, transverse and short oblique fractures in patients selected in appropriate indications.

OP-29

Functional outcomes after proximal phalanx fractures operated with WALANT anesthesia method

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Objective: Many of the phalangeal fractures can be treated conservatively, but open reduction and internal fixation is required for malrotated and unstable fractures. Early physiotherapy positively affects the functional outcome. Wide awake local anesthesia no tourniquet (WALANT) method has gained popularity recently, mostly due to possibility to evaluate intraoperative active motion (1). Patients observing their active motion intraoperatively will be motivated for post-operative physiotherapy, as well. The aim of our study was to compare the functional outcome of surgically treated proximal phalanx fracture patients with either general anesthesia (GA) or WALANT.

Methods: Twelve surgically treated proximal phalanx fracture patients (open reduction and internal fixation with plate and screws) with a mean age of 28.5 (12-45) were included in this study. There were six patients operated with WALANT and six patients operated with GA. Range of motions of the fingers were measured by goniometer 4.6 ± 3.3 months following surgery. Upper extremity functional status and quality of life were assessed by DASH and SF-36 questionnaires.

Results: There was not any difference between the mean ages of the groups (WALANT 29 and GA 28

years). The mean range of motion of the fingers in WALANT group (81.7° ± 24°) was significantly higher (p<0.05) than that of the GA group (55.9° ± 20.1°). There were no statistically significant difference between groups in DASH mean scores (WALANT 6.67, GA 5.2, and p=0.4) and SF-36 mean scores (WALANT 5.75, GA 5.2, and p=0.7).

Conclusion: The use of WALANT method for surgical treatment of proximal phalangeal fractures seems to have important benefits. With WALANT technique, the evaluation of intraoperative active motion helps to surgeon to assess the quality of fracture reduction and fixation. Moreover, the intraoperative education of the non-sedated patient probably increases patient motivation and compliance with postoperative rehabilitation.

OP-30

Fixation of metacarpal fractures with antegrad intramedullary Kirschner wire by using preoperative surgery planning

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Aim: Metacarpal fractures are one of the most common fractures of the hand.1,2,3,4,5 Various stabilization technique of the metacarpal fractures have been described previously with good functional results.1,2 In this study, we present using of preoperative virtual planning and our antegrad kirschner teli (K-wire) applications in metacarpal fractures.

Materials and Methods: 33 closed metacarpal fractures were included in the study. 21 patients had 5th metacarpal neck fractures, 7 patients had 5th metacarpal shaft fractures and 5 patients had combined fractures of proximal phalanx and other metacarpal fractures. Preoperative model study was done by using three-dimensional x-ray images and photoshop software and metacarpal dimensions, fracture localizations, angulation and length points of K-wire were determined. A 5-10 mm skin incision was made on the dorsal base of metacarpal bone during surgery. Extensor tendons, neurovascular structures and articular surfaces of the metacarpal bone were preserved and a 2-2.4 mm hole was drilled. After fracture reduction, prebent intramedullary K-wire was advanced ante-

grade direction to the metacarpal head by hammer. A second wire was applied when necessary. (Image 1) In cases with proximal phalangeal fractures, K-wire was advanced to proximal interphalangeal joint. An intrinsic-plus position hand splint was used for all patients. Pain, functional limitation and patient satisfaction were assessed by visual analog scale (VAS), The Disabilities of the Arm, Shoulder and Hand Score (QuickDASH) and patient satisfaction scale (PSS), respectively. All patients were followed up for 19 (12-23) months.

Results: 25 patients were male, 7 patients were female. Average age of them was 21,1. In all joints, full range of motion was provided 2 weeks after the surgery without pain and limitation. Non-union and rotation deformities were not observed in the following time. Mean surgery time was 22 minutes. On average postoperative 34th day, K-wire was removed after union detection on x-ray. The mean DASH, VAS, PSS were 8.5, 2.4, 9.2 respectively.



Figure 1. Fixation of 5th metacarp neck fracture with antegrade K-wire approach.

Discussion: Various techniques have been used to treat metacarpal fractures.1,2,3,4,5 "Foucher" achieved a very stable fixation with intramedullary K wire and identified the "Bouquet" antegrade k-wire technique.5 The antegrade approach provide good stability of the fractures with minimal dissection and short immobilization periods without nerve, tendon and joint injuries. This method is also an alternative fixation method with short repair time with preoperative planning.

OP-31

The results of Metaizeau technique after closed reduction in displaced radius neck fractures

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Objectives: Judet III and IV paediatric radial neck fractures are rare and surgical treatment is usually necessary. Reduction with closed manoeuvre, reduction with a joystick percutaneous K wires or reduction with intramedullary devices using the Metaizeau technique is recommend for fractures between 30 and 60 of angulation and displacement. In contrast, it is often required open reduction for fractures with 60 of angulation and displacement. The aim of this study is to present the results of Metaizeau technique in applied addition to combined reduction manoeuvre in the surgical treatment of Judet III and IV paediatric radial neck fractures.

Material and Methods: Twenty-five patients (15 males, 10 females) who underwent surgery due to Radius neck fracture were included in the study. The mean age of the patients was 8.87 years (4-14 years). The left side was involved in 15 patients (60 %). According to Judet's classification, 3 patients had type IV fractures and 22 patients had type III fractures. The mean angulation angle was 57° (35°-100°). The mean of surgical duration was 31±12.5 minutes and the mean follow-up was 7.68 months (4-15 months). Under general anesthesia and at control of fluoroscopy, all patients was applied elastic bandage from the wrist to up to the elbow. Then, it is applied pressure to the radial head by applying traction in varus position of forearm after taking to the supination position of forearm and to the extension position of elbow (combined of elastic bandage technique and Patterson maneuver). The final reduction and fixation was made with the Metaizeau technique after re-position of fracture was examined under a fluoroscopy and then, it was taken to the long arm plaster. All patients was underwent the surgery treatment within the first 24 hours and they were discharged on

the 2nd days. The mean of plaster application duration was application 25,04 days (1448 days), and then exercises were given for range of motion of elbow joint and forearm. Kirschner wires were removed on the average sixth weeks. Radiological results were evaluated according to Metaizeau criteria and functional results were evaluated according to Tibone and Stoltz criteria.

Results: In all patients, fracture healing was achieved. No patients were need to assistance of reduction with a joystick percutaneous K wire or open surgery. Epiphyseal ischemia was seen in 4 cases. All patients were excellent radiological results. Functional results were excellent in 23 patients and it was good in 2 patients.

Conclusion: We believe that the reduction and fixation method applied with Metaizeau technique after combined closed reduction maneuver is adequate and safe for the treatment of radial neck fractures requiring surgery.

OP-32

An interesting complication after radius neck fracture: Radius head dislocation

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Objectives: Conservative treatment is recommend for radial neck fractures with <30 degrees of angulation in children, but surgical treatment is recommend for fractures with >30 degrees of angulation. Postoperative complications such as epiphyseal ischemia, early closure of the physis and heterotrophic ossification are observed. We presented a patient who has a radial head dislocation due to radial head overgrowth towards fracture displacement conservatively treated after radius neck fracture.

Case: An 9-year-old male patient who was treated conservatively for radius neck fracture with anteriorly 20 degrees displacement was admitted due to limitation of elbow motion. On physical examination, the flexion of elbow was measured 90° and the supination and pronation of forearm range were measured 60°. On radiologi-

cal evaluation, it was observed anteriorly overgrowth at part neck of radius head, and it was observed anteriorly dislocation of radius head. The patient was taken to surgery. It was performed the posterolateral approach in the pronation position of forearm. The annuler ligament was excised and the structures of the ligament and capsule preventing the reduction were removed by entering between anconeus and extensor carpi ulnaris. It was observed anteriorly the angulation and displacement of radial head, and the radius head was not in front of the capitellum. It was performed closed posterior wedge osteotomy, and it was fixed with plate after the radial head is brought directly opposite the capitellum. Intraoperative evaluation revealed that the radial head was slightly displaced towards the antero-medial during pronation, but it was observed that the relationship between capitellum and radial head was improved in the supine position. Then the annuler ligament was repaired and the wound was properly closed. The exercises of range of motion the forearm and elbow joint were started after it was immobilized the extremity with plaster during four weeks. At the last follow-up at 6th month, it was observed that the pronation motion of elbow was completely perfect, and the lack of supination motion of elbow was only a 20 degrees. This condition was presumably due to the plate placed in the anterolateral. Avascular necrosis was observed in the head of the radius. It was observed that the extension motion of elbow was completely perfect and the flexion motion of elbow was almost complete.

Results: We think that it is important the amount of displacement and direction of displacement in the conservative treatment of displaced radius neck fractures, and it is should be taken into consideration overgrowth in the direction of displacement during fracture healing. As seen in our case, the observation of radial head dislocation due to overgrowth in long-term follow-up of simple radial neck fractures indicates that conservatively treated fractures are not very innocent.

OP-33

Static external fixation results of the complex fractures about the proximal interphalangeal joint of the hand

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Purpose: To evaluate the treatment results with static external fixation of the complex fractures of the proximal interphalangeal joint of the hand.

Patients and methods: In twelve-months period of 2017, joint-spanning, static external fixator was applied to 17 fingers of the 16 patients with complex fractures about the proximal interphalangeal joint. Additional screw or K-wire fixation was used for 7 patients. Extensor mechanism repair (7 patients) and collateral ligament repair (1 patient) were the additional procedures. Skin grafting (1), flag-flap (1), amputation at distal phalanx (2), extensor tenolysis (4), flexor tenolysis (1), and hemi-hamate osteochondral grafting (2) were the supplementary procedures performed in another session.

Results: All fractures were united at an average of 44 days (range, 21 to 98 days). There was no pin-track infection or non-union. In follow-up examination, the average flexion was 80° (40-110), and average extension was 10° (40-110). Complications were as follows: one mild swan-neck deformity, two coronal plane deformities, one condylar avascular necrosis, four extensor mechanism adhesions.

Conclusion: Despite the unfavorable nature of the complex fractures of the proximal interphalangeal joint fractures, a satisfactory outcome can be expected from treatment of such fractures with external fixator.

OP-34

Results of nerve transfers in traumatic brachial plexus palsy

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Objective: The aim of this study is to present the results of nerve transfers performed for traumatic brachial plexus palsy at different level.

Materials-Methods: Between 2007 and 2015, we operated 33 traumatic brachial plexus palsy, including 05 total palsy, 03 C5 - C6-C7 palsy, 24 C5-C6 palsy and 01 paralysis of the axillary nerve. For total palsy, we favored the recovery of the flexion and extension of the elbow by a transfer of the spinal accessory nerve on the

biceps nerve for recovering flexion and the transfer of intercostal nerves on the triceps nerve for recovering extension. For C5-C6 -C7 palsy we performed a transfer of the intercostal nerves on the triceps associated with a transfer of motor fascicle of ulnar nerve on the nerve of biceps and motor fascicle of median nerve on the nerve of brachial according to Oberlin's technique. For C5-C6 palsy, we performed a double transfer according to Oberlin's technique for recovering elbow flexion. For paralysis of the axillary nerve, we transferred a motor fascicle of the triceps (long head) nerve on the axillary nerve according to Somsak procedure.

Results: For the 05 total palsy, we obtained two complete recoveries of flexion and extension of the elbow to M4, the recovery of only elbow extension in one patient and two failures. For the 03 C5 - C6-C7 palsy, we obtained a complete recovery of the flexion and extension of the elbow in 01 patient and the recovery of the only elbow flexion in two patients. For the 24 C5-C6 palsy, we obtained 21 recoveries of elbow flexion to M4, 01 recovery to M2 and 02 failures. For the axillary nerve palsy, the patient recovered a deltoid to M4.

OP-35

The results of midterm functional treatment of patients who received surgical treatment for mallet finger injury

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Background: The present study aimed to report the functional treatment outcomes in patients who underwent surgery for mallet finger injury, a significant cause of workforce loss.

Methods: Among the patients who referred to our clinics with mallet finger injury between 2009 and 2017, medical files of 22 patients who received surgical treatment were retrospectively reviewed. Demographical characteristics of the patients, dominant hand relation, presence of osseous or tendinous involvement, the hand and fingers involved, comorbidities, type of injury, time until surgical treatment and any treatments received during this time, recurrences and potential complications were recorded, and Crawford criteria during

post-operational follow-ups and post-operational patient satisfaction scores were evaluated over a mean follow-up period of 34.09 months (9-84 months).

Results: When the patients were questioned by using Crawford functional scoring at the end of the follow-up period, 68.2% reported very good-good and 31.8% reported moderate-poor functional status. Post-operational satisfaction was reported as very good-good by 86.3% and moderate-poor by 13.7% of the patients. None of the patients experienced recurrence. In total, 3 patients developed minor complications.

Conclusion: In conclusion, the post-operational satisfaction rate of 86.3% in patients referring with mallet finger injury indicated that the outcomes of surgical treatment were satisfactory when the surgeries were performed by experienced hand surgeons.

OP-36

The use of vascularized skin and subcutaneous tissue to create thenar fullness during the preaxial 3 finger pollicization in Mirror hand cases

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Objective: Mirror hand is a symmetrical duplication of the upper extremity and is a rare midline anomaly. It is a congenital anomaly in which there are 7 fingers with no thumb and in which ulna is duplicated and there is no radius. In order to gain a functional hand, 2 lateral fingers should be amputated and preaxial 3rd finger pollicization is required.

Case: In the patient with right hand involvement at 4 years of age, the movement of the wrist is restricted and the shoulder movements are normal. We planned the 3rd finger pollicization with the aim of creating thenar fullness by protecting the skin and subcutaneous tissues of the last two fingers in a way that will be vascularized.

Technique: The phalanx and metacarpus of the two lateral fingers were amputated and the skin and subcutaneous tissue were preserved in a way that will be vascularized. Digital nerves and veins of 3 fingers were dissected and preserved. The connections between the third and fourth fingers were dissected and separated,

and the metacarpal body of the three fingers was excised in a manner that will protect the metacarpal basis and head. The extensor tendons were plicated and dorsal and volar interosseous muscles were used in a way that they will be the adductor and abductor muscles of the thumb. After the reconstruction of the new carpometacarpal joint, the 1st and 2nd fingers whose metacarpus and phalanx were excised were deepitelized from the distal and were folded on themselves and excessive skin was adapted to the first web to create fullness.

Result: In our technique, not only an aesthetic purpose is observed, but it is also aimed to achieve a deep 1st web function.

OP-37

Microsurgery training with smartphone

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Microsurgery is widely used in experimental research models and clinical surgery. However, there require precise technical skills and continuous training. Here, we proposed a new, low cost, practical microsurgery model, which can be easily applied using smartphones at home or at office.

A test platform of latex gloves was first created. The instruments required for the training model included a microsurgical needle holder, microsurgical forceps, microsurgery scissors, 9-0 nylon suture, a smartphone and a phone holder. The phone holder was placed on the side of the table, such that it could be comfortably reached from the test platform. Next, a smartphone with its camera at the 10x magnification was secured on the phone holder. After securing the smartphone, the camera was focused on the microsurgical operation site. Finally, microsurgical device habit, stitching and knotting exercises by making cuts at different angles on the glove model were performed under 10x magnification; the video was recorded live and was saved for training purpose

We believe that the practical microsurgery model presented in this study can form an important part of basic microsurgery education and also act as an alternative training model owing to its ease of application, easy accessibility and low cost.

OP-38

The impact of digital artery repair on sensory recovery in patients with digital nerve repair

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Purpose: How digital artery repair affects the outcome of finger sensation besides the digital nerve repair with treatment of patients with digital artery and digital nerve injury.

Materials and Methods: A total of 128 patients (82 males and 46 females) underwent digital nerve repair surgery and operated by same surgeon were included in this study. Demographic characteristics of patients, Two-Point Discrimination test and The Semmes-Weinstein monofilament test results were recorded.

Findings: Gender distribution of the study participants are %64,1 males (82 patients) and %35,9 females (46 patients). The age distribution are %47,0 (55 patients) aged 25 years and under, %31,6 (37 patients) aged between 26 and 35 years, %16,2 (19 persons) aged between 36 and 45 years and %5,1 (6 persons) aged 46 years and over. While %64,8 (83 persons) of the study underwent only nerve surgery, %35,2 (45 persons) underwent nerve and artery surgery on same finger.

Results: A postoperative tactile sensation in patients that underwent digital nerve repair along with artery repair was found to be better and statistically significant than in patients underwent only digital nerve repair ($p < 0.05$).

OP-39

The effect of fat tissue-based stem cell application on nerve transfer in rat brachial plexus model

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structive and Aesthetic Surgery ⁵Selçuk University School of Medicine, Department of Histology and Embryology

Objective: In this study, it was planned to compare the groups in which nerve transfer was performed and the groups combined with the stem cells in the brachial plexus injury model.

Material - Method: In this study, a total of 28 female Wistar rats were used. In all groups, C5-C6 roots were avulsed and ulnar-musculocutaneous nerve transfer was performed. Rats were randomly divided into four groups (7 rats in each group): nerve transfer (group 1), nerve transfer with nerve graft (group 2), stem cell added to nerve transfer (group 3) and nerve transfer with nerve graft and added stem cell (group 4). At the end of the 8th week, the groups were evaluated histologically and electrophysiologically.

Surgical Procedure: On the left side, the paravertebral muscles were crossed (Figure 1b-c). Under the microscope, the brachial plexus body structures were exposed in the deep plane (Figure 1e-Figure 2). Arcus structures of the vertebrae constituting the upper body were opened with very sensitive dissection and the C5-C6 roots that matched this region were cut.

In the left upper extremity, an incision extending from the clavicle to the left arm was performed (Figure 3a). After the pectoral muscle was passed, brachial plexus musculocutane, ulnar, median and radial nerves were revealed (Figure 3b). In the study, the musculocutaneous branch of the brachial plexus was found and it was cut near it entered the biceps muscle. (Figure 3c). Later, the ulnar-musculocutaneous nerve transfer described by Oberlin was planned. The same sided ulnar nerve was found. Under the microscope, the epineurium of the ulnar nerve was opened (Figure 3d). The randomly selected single fascicle of the ulnar nerve was dissected towards approximately 1-2 cm to the distal and proximal. (Figure 2e). The ulnar nerve fascicle that was prepared (Fig. 3f) was neurotized by suturing 10/0 end to end or one by one with 11/0 prolene to the musculocutaneous nerve that was prepared (Fig. 3g-h).

Findings: There was a meaningful difference between group 1 and group 2 and between group 3 and group 4 in terms of latency values ($p < 0.05$). There was a meaningful difference between the axon values of group 2 and group 3.

Result: As a result of an eight-week examination, the

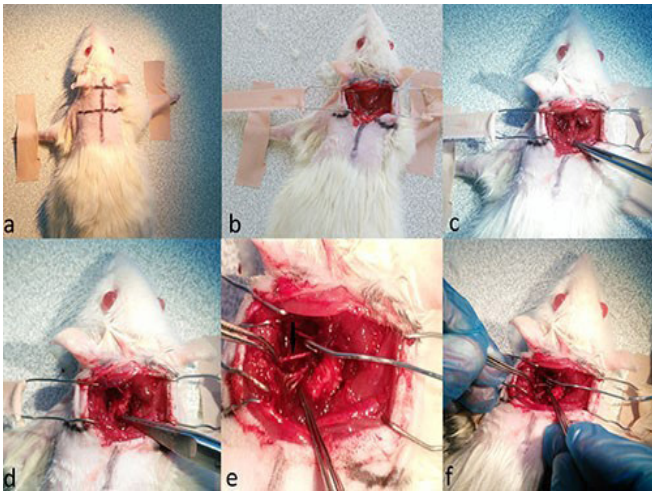


Figure 1. Dorsal dissection of the rat brachial plexus a: Dorsal incision b: Cervical paraspinous muscles c-d: Cervical vertebrae e: Brachial plexus f: C5-C6 root avulsion.

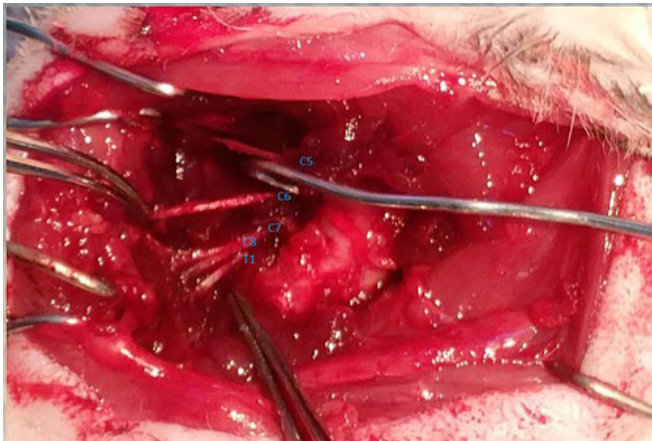


Figure 2. Rat C5-T1 roots.

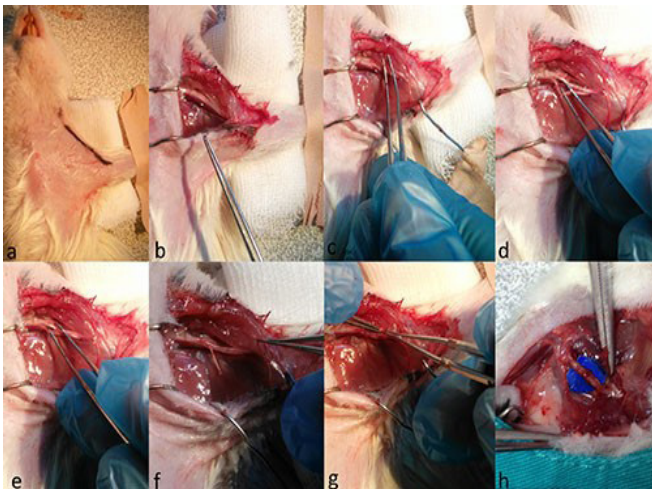


Figure 3. a: Incision b: Pectoral muscle c: Musculocutaneous nerve d: Ulnar nerve e: Ulnar nerve fasciculus f-g: Ulnar - musculocutaneous transfer h: nerve transfer anastomosis.

effect of stem cell on nerve transfer may be positive by histomorphological and electrophysiological evaluation. However, further studies with periodic tests and longer follow-up periods should be planned.

OP-40

Technical details of repair of tissue defects in upper extremity with free groin flap

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Objective: Soft tissue defects in the upper extremity are usually seen after trauma, burn, infection and mass excision. Soft tissue reconstruction of the upper extremity is difficult because of the fact that it is a moving area and due to abundance of functional structures. Because of the variability of the anatomical variation of the groin flap, complications that can be observed should be prevented to increase flap survivability. In this study, technical details of reconstructive surgery with superficial circumflex iliac artery based free groin flap of upper extremity soft tissue defects are presented.

Material - Method: Between 2013 and 2017, free groin flaps were applied to 5 patients with a tissue defect in the upper extremity. Five male patients with a mean age of 29 and without any additional disorders were included in the study. The defect sizes, free groin flap indications, post-operative complications of the patients were reported.

Findings: The injury etiologies of the patients were fire-arm injuries, burns and inner vehicle traffic accidents. No problems were encountered in flap follow-ups. Flap revision was made in 1 patient.

Conclusion: The functional and aesthetic repair of the reconstruction of the tissue defects in the upper extremity is difficult. The reconstruction options should be evaluated well, as they have an important place in terms of the function and they can restrict joint movements. The free Groin flap should be preferred primarily because it has good vascularity, the donor site can be closed primarily, and the 20*30 cm flap can be lifted. Doppler should be used in the preparation of the flap and detailed drawing should be done before elevation. Multiple vascular structures should be preserved, if

possible, during flap dissection. The duration of ischemia should be kept short and the pedicle should not be separated until the dissection is completed and the pedicle is put forward. The dissection should be continued by monitoring with Doppler after observation of the fascias. If a very large flap is being lifted, SPY can be performed to pinpoint the Angiosome. In addition, the fact that the free groin flap can be made with a single session, it does not cause muscle damage when the flap is lifted, it is pliable and permits joint movements and forms a slippery surface are some of its important features. In the reconstruction of the upper extremity tissue defect, knowing the free groin flap anatomy well in terms of the aesthetic and functional aspects will make a good application of the flap making it possible for two teams for the preparation of the donor area and the recipient area.

OP-41

A brief evaluation of a failed replantation

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Objective: The replantation case is at the foremost of the emergency cases that require the fastest intervention in the hand surgeon, and while the amputate is usually delivered to the hospital with the relatives of the patient in cases where it occurs in the same city, in transfers between different cities, it is sent by ambulance and cold chain to a large extent. In this report, we will try to discuss the causes and its precautions with respect to a failed case

Case: A 17-year-old male patient referred to the emergency department with total amputation resulting from crushing. As a result of a stone block falling on his hand, his finger was totally amputated from the middle of the right hand D2 mid-phalanx, and in another hospital where he referred to in another city, the amputate was sent by being wrapped in ice after evaluation. The patient was operated 5 hours after injury. In the operation, bone fixation, tendon nerve repair, 1 artery, 1 vein anastomosis were performed and it was observed that circulation was provided. Subsequently, although the finger of the patient who was followed up postoperatively was observed to be normal on the 1st day, venous insufficiency followed by necrosis was seen on the fol-

lowing days and it was closed as a stump

Discussion and Conclusion: Although a specific path map for replantation surgery is being established in our country, there are still some deficiencies. One of them is that the cold chain is not observed during transportation of patients between remote centers. Given that there are successful results in small injuries such as finger amputations even with delays of 6-12 hours in the literature, the importance of transportation of the patient under appropriate conditions shall be better understood. In the present case, even though the finger of the patient who came from another province was replanted and kept alive for a while, it was lost afterwards. Despite the fact that there are many reasons for this, one of them is that proper transport was not made. For this reason, we recommend that short-term training programs be provided to emergency personnel in peripheral hospitals, especially those with frequent changes in emergency teams, where new graduate staff is frequent, and patient density is continuously increasing.



Figure 1. Amputated finger.



Figure 2. Start of circulation in the finger after anastomosis.



Figure 3. The finger with circulation observed to be normal on the postop 1st day postop.

OP-42

Reconstruction of the upper extremity neurovascular defects with flow-through arterial venous sural nerve flaps

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Objective: This study presents a comparison of flow-through arterial venous sural nerve flaps and classical nerve grafts applied to patients with both nerve and arterial defects due to upper extremity traumas. With this method; it is aimed to obtain better nerve recovery results with a nervous tissue that is blooded and also to repair the existing vessel defect without additional donor site morbidity.

Material - Method: The study's flap group included 6 patients who underwent surgery with "flow-through" arterial venous sural nerve flap between January 2013 and February 2014. The common feature of patients with a mean age of 25 was that they had both vascular

and nerve defects in the upper extremity. Six of the patients who had previously undergone upper extremity nerve repair with sural nerve grafting were included in the graft group. The graft group patients were randomly selected among patients whose nerve defect size and postoperative follow-up were similar to those of patients who underwent flow through nerve flaps.

Findings: The EMG nerve conduction velocity, amplitude and latency values at 6th month were significantly different in the flap group compared to the graft group ($p < 0,05$). EMG nerve conduction velocity, amplitude and latency values in the 12th month showed similarity in the graft and flap group. ($p > 0,05$)

There was no meaningful difference between the flap group (5.3 mm) and the graft group (4.8 mm) in the average in millimeters of the two-point discrimination tests in the 12th month. ($p > 0,05$)

In the 1st week and 1st month, the repaired artery patency of all the patients was confirmed by Doppler ultrasonography. In the 6th month, the presence of current was confirmed with Doppler in 5 patients.

Result: The fact that the number of cases is limited may be a restriction of the study, but trauma with both arterial and neural defects refer to the clinic in a limited number.

In patients with nerve defects who are not expected to recover adequately when admitted as non-vascularized, arterial venous sural nerve flaps are seen as a good option in upper extremity injuries with both nerve and vascular defects and in upper extremity injuries with motor nerve damage.

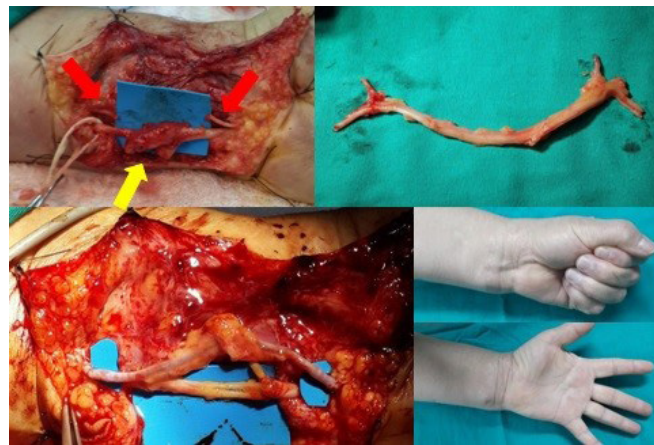


Figure 1. 38 year old male patient's occupational injury.

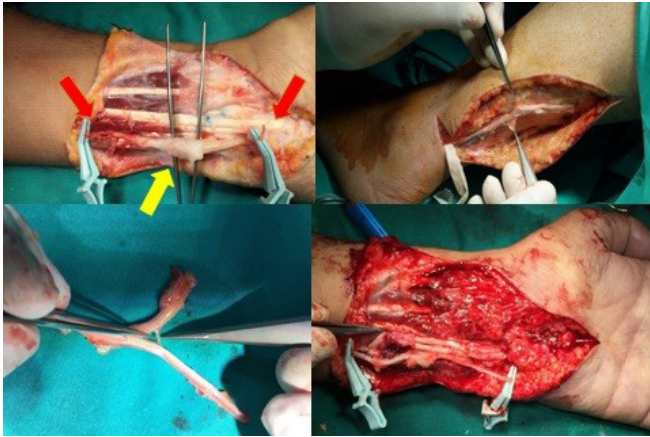


Figure 2. 26 year old male patient's occupational injury.

OP-43

The effect of zone iv extensor tendon injuries on the disintegration in the early active movement repair site after repairing with three different suture methods (cadaveric study)

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Objective: The success of surgical treatment of extensor tendon injuries is related to the rehabilitation program applied after repair as well as the features of the repair technique used. The movement that starts early after the tendon repair accelerates tendon healing and prevents the adhesion. In this study, we aimed to investigate the effects of early active movement applied after extensor area IV tendon repair carried out with 3 different suture techniques on the area of repair.

Material - Method: For the study, 9 upper extremities were used, taken from the middle level of the humerus of fresh frozen cadavers. When the extensor tendon was robust, area IV tendon length and the forces required to bring the finger to flexion and extension were measured. Then the same measurements were made after the tendons were cut and repaired. For the repair, 3 different suture techniques - Double Modify Kessler, double Figure of Eight and Running Interlocking Horizontal Matress (RIHM) and 3-OPDS suture were used. For each finger, 200 flexion and 200 extensional move-



Figure 1. Specimen taken into arm clamp.



Figure 2. Measuring the flexion force required to touch the fingertip in the palm.

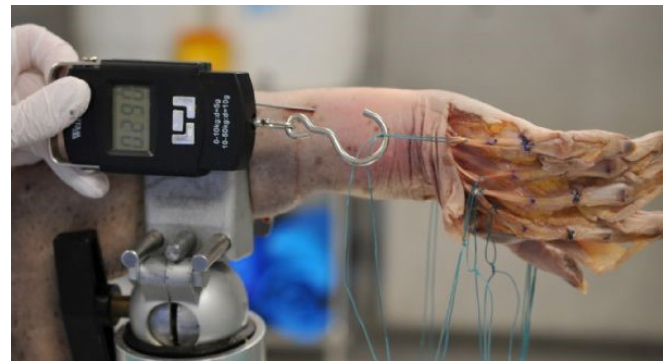


Figure 3. Measuring the extension force required to bring MCP joint to 0 degree extension.

ments were applied along the tendon axis without sudden loading. After every 20 movements, it was checked whether a gap was formed or not, and the time of first gap formation and the time of 2 mm gap formation were recorded. For the tendons in which a gap did not occur, 50 flexions and 50 extensions more were applied with a force 2 times as much as the previous forces and the separation in the repair zone was recorded.

Findings: After the repetitive movements applied to the repaired tendons, no suture technique was found insufficient. There was no measurable disintegration in any tendons. For tendons that did not develop any gap, 50 flexions and 50 extensions more were applied with a force 2 times as much as the previous forces. As a result, there was no deficiency or disintegration

Result: Gold standard stitching technique applied to extensor tendon injuries has not been shown. In this study, we compared three different suturing techniques used in extensor tendon repair. We examined the changes in the repair area with early active movement in the tendons which were repaired and the effect of suture techniques on tendon shortening. We have found that these suture techniques are resistant to in vitro conditions in terms of being able to start early active movements after repair. We did not find any statistically significant difference between the effects of the suture techniques we used on the tendon shortening. These findings suggest that every 3 methods that we apply to start early active movement after repair in extensor area IV tendon injuries are safe. This study is an in vitro study and needs to be supported in vivo and with clinical studies.

OP-44

Effect of mitomycin C in the prevention of tendon adhesion after surgery and the effect of biomechanical stretching on tendon histology

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Background: Adhesions and scar formation after flexor tendon surgery lead to ineffective treatment. For this reason; we investigated the effect of mitomycin C, a drug we thought could reduce tendon adhesions that

frequently appear after tendon surgery. We also investigated how the tendon-drug complex and tendon adhesions were affected by adding biomechanical studies.

Materials and Methods: 56 chicken tendons were used in our study. A total of 9 groups were formed. The right legs were used for histology, the left legs were used for histological + biomechanical testing except for the control groups that were not operated.

FDP tendon was revealed with 2 cm incision in the midlateral plane made of middle finger volar. Transverse incisions were made to keep the tendons 20% intact. It was sewn with modified tress kessler technique with 5.0 tropheylene. Then, the drug at the planned dose was applied between the tendon and sheath using a strip for 5 minutes. The sheath was closed with 6.0 silty tress skin.

After appropriate rehabilitation, the chickens were sacrificed. Macroscopic (Jinbo et al.), Microscopic (synovial sheath thickness, active fibroblast number), biochemical evaluation were performed by taking tendons.

Mann Whitney U test was used for the statistical evaluation, Kruskal Wallis variance analysis was used for biomechanical evaluation.

Findings: Macroscopic: Most adhesions were seen in control groups. There was no difference between groups with the same dose of mitomycin C. There was no difference between the groups that did not undergo biomechanical stretching but there was a difference between the biomechanical stretching groups themselves.

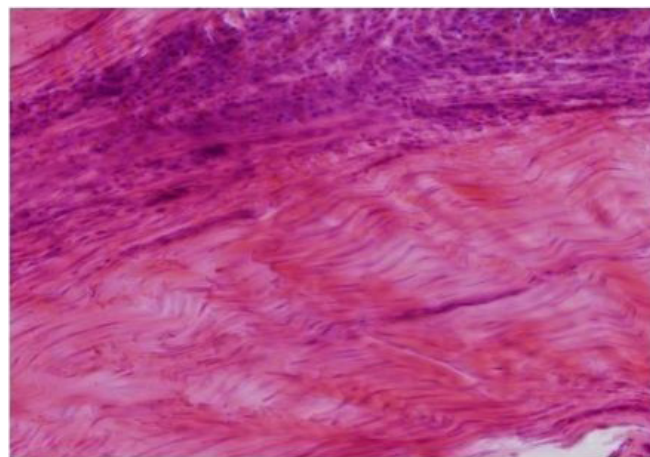


Figure 1. Magnification of the sample taken from the biomechanical stretching group using 0.2mg / mL Mit-C for example.

Histological evaluation revealed minimal adhesions in group VIII.

The number of active fibroblasts was at least seen in group VIII.

The thickness of synovial sheath was at least seen in group VIII.

Result: 1- The most adherence and scar tissue were seen in surgical control groups. 2- It has been observed that adherence decreases in all groups using mitomycin c. 3- Side effects of systemic side effects and tendon healing were not adversely affected. 4- The results of the biomechanic stretching group with 0.2 mg / mL drug were more meaningful and enabled us to have an idea about the appropriate dose. 5-It has been seen that the use of single dose of medicine is advantageous.

OP-45

Results of 4-strand modified Kessler core suture and epitendinous interlocking suture followed by modified Kleinert protocol for flexor tendon repairs in zone 2

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Objective: There has been no consensus in literature for the ideal flexor tendon repair technique. The results of zone 2 flexor tendon lacerations repaired primarily by 4 strand Modified Kessler core suture and epitendinous interlocking suture technique followed by Modified Kleinert protocol were investigated.

Methods: 128 fingers of 89 patients who had flexor tendon laceration in zone 2 built the working group. Functional outcomes were evaluated using the Strickland formula. A statistical analysis was made between Strickland scores and some parameters such as age, gender, follow-up time, co-existing injury existence, repair time, single or multiple finger injury, tendon rupture and the effect of FDS injury and repair.

Results: Excellent, good, fair, poor results were ob-

tained from 71 (55,5%), 46 (35,9%), 8 (6,3%), 3 (2,3%) fingers, respectively. Time of the repair has a significant effect on the strickland scores. Surgery performed within the first 24 hours following the injury gave better results. 3 fingers (2,3%) had tendon ruptures. Existence of ruptures affected the results significantly. Co-existing injuries were found that they did not have any effect on the results. In the fingers in which both FDP and FDS tendons were lacerated, no significant relationship was found between only FDP repair, both FDP and FDS repair and single FDS slip repair. Additionally no significant relationships between follow-up time, gender, single or multiple finger injury and Strickland scores were observed. 13 fingers (10,1%) had PIP joint contracture above 20 degrees.

Conclusion: The low rupture rate (2,3%) and 91,4% 'good' and 'excellent' scoring rates in our series support the idea that modified Kessler 4-strand core suture and epitendinous interlocking suture repair combined with modified Kleinert protocol gives satisfactory results. Repair time is one of the most important factors affecting the functional results and surgery should not be delayed if there is an experienced surgeon available.

OP-46

A retrospective study of supinoplasty procedures in obstetric brachial plexus palsy, thesis in orthopedics and traumatology, Ankara 2017

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Patients with obstetric brachial plexus palsy(OBPP) have various deformities, is encountered according to the affected nerve area. Pronation contractures also emerge as a limitation that causes physical and emotional problems in this group of patients. However, in the literature, management of brachial plexus patients having pronation contracture is limited. The data for the pronation contracture belongs mainly to studies performed in patients with cerebral palsy (CP). Due to the lack of comparative studies on this subject, there are some limitations in the algorithms. The primary purpose of this study was to determine the contribution of PT re-routing and FCU-ERCB transfers for supination

in OBPP patients having pronation contracture and to compare the results of surgery with Turkish version of SF-36 and DASH scoring surveys. On the other hand, radiographic evaluation of the radial head for dislocation and subluxation was evaluated as a secondary aim. In the study, it was observed that in the PT rerouting group gained more supination than the FCU-ERCB group. ($p = 0.028$). Apart from these, both patient groups were found to have emotional and physical role limitations, which were found to be associated with the Narakas grade. However, no statistical difference was found in the study groups. No significant difference was found in radial head dislocation and subluxation in both groups of surgery. In conclusion, this study suggests that PT re-routing patients can achieve more pro-supination than FCU-ERCB transfer.

OP-47

The impact of occupational therapy program on function and activity performance of repaired traumatic hand injuries

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Background: In recent years, a significant amount of research in the field of tendon injury in the hand has contributed to advances in both surgical and rehabilitation techniques. There is overwhelming evidence to show that carefully devised rehabilitation programs are critical to achieving favorable outcomes. Whatever the type, or level, of flexor or extensor injury, the ultimate goal of both the surgeon and therapist is to protect the repair, modify peritendinous adhesions, promote optimal tendon excursion and preserve joint motion. However, on repair ruptures, the function, performance and satisfaction are still unpredictable.

Objective: The aim of this study was to examine the efficacy of the occupational therapy program (client centered functional activity training-CCFAT) applied after the rehabilitation program of individuals who have repaired hand injury.

Method: Seventeen patients (age 38.27 ± 14.24 16-68 years, 12 male, 11 right hand injuries, 9 injuries 2 injuries, muscle group injury) with zone I-V were operated on by one surgeon and assessed by one hand therapist.

For the patients, according to their impairments, an exercise program including passive, active assistive, and active range of motion and strengthening exercises in addition to physical modalities was applied (for six weeks, 3 session a week) after 2 weeks then repair. Then first assessment applied with the 9-hole peg test and the Michigan Hand Outcome Questionnaire (MHOQ) (were used to assess functional status) and the Canadian Occupational Performance Scale (COPM) (were used to assess occupational performance). Then, CCFAT, a program composed of 25 activities that mimic activities of daily living (ADL), was performed for 4 weeks (2 session a week). Pre-treatment (8th week) and post-treatment (12th week) scores were assessed with the Wilcoxon Rank Test.

Results: the performance of 9 hole peg test and general hand function, daily living activities, work performance and satisfaction subscales of MHOQ and occupational performance were improved to be statistically significant before and after CCFAT ($p < 0.001$). However, pain and physical appearance subscale of MHOQ and life satisfaction were not improved to be statistically but clinically ($p > 0.05$).

Discussion: This study showed that an evidence was found for the CCFAT over early controlled mobilization and rehabilitation program to increase the hand function and performance of the individual after repair. High quality prospective studies should be performed to further explore the outcomes of rehabilitation with CCFAT.

OP-48

Long term results of ulnar palsy patients who had tendon transfer surgery for ulnar palsy between years of 2008-2018

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Purpose: There are static and dynamic tendon transfer and tenodesis procedures described for ulnar palsy patients. Ulnar claw hand deformity can cause severe loss of daily functions of the hand if not treated properly. In this study we will discuss the long term results of ulnar palsy patients who underwent tendon transfer in our clinic for the past decade.

Material and Method: 11 patients were included in this study. Ages of the patients were between 25-52. All

patients underwent tendon transfer surgery in which flexor digitorum superficialis tendon of ring finger was split on 4 pieces and passed inside lumbical canal of fingers and sutured to lateral bands. After four weeks of immobilisation active physical therapy is started. On post op examination was performed between the years of 2008 and 2018. During these examinations we evaluated goniometric values, the extension loss on PIP and DIP joints while MP joint is on 90 degrees flexion, muscle strength and grasp strength.

Results: Eleven patients who underwent tendon transfer for ulnar palsy between years of 2008-2018 were included in this study. Etiology of ulnar nerve injury for all patients were by penetrant trauma except one patient had electric burn. One of the patients had both ulnar and median nerve palsy and one patient had brachial plexus paralysis. The goniometric study the mean of flexion degree for index finger was 193.4, for middle finger 195.4, for ring finger 200.4 and for small finger 214.6. The loss of extension on PIP and DIP joints were detected only in 2 patients. These patients had 30 degrees of extension loss. The grasp strength was measured for healthy and effected hand. The mean for effected hand was 14.4 kg and 37.2 kg for the healthy hand. The muscle strength for dorsal and palmar interossei muscles were 0 for all patients except one and that patients strength was measured 1. All patients had protective sense.

Discussion: Dynamic treatment methods for ulnar palsy are transfer of FDS4 or ECRL tendons to lateral band in order to obtain MP and IP joint extension. The use of FDS4 tendon is controversial because if FDS tendon is ruptured in forearem this tendon could only be used as donor after 1 year past inital repair.

OP-49

Mid-term results of patients for whom two-stage tendon repair was performed in late tendon repairs

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Objective: We aimed to present the mid-term functional and clinical outcomes of 10 patients who under-

went 2-stage tendon repair due to flexor tendon injury in our clinic between 2012 and 2017.

Material - Method: We retrospectively evaluated the clinical and functional results of 2-stage tendon repair after flexor tendon injuries between October 2012 and March 2017. 8 patients were male and 2 of them were female among the patients with the mean age of 21.4 (4-34). In the first stage, a hunter prosthesis was placed to form a tendon bed. After the first operation, no movement restriction was made. All patients underwent reconstruction with 2-stage tendon grafts after 3 months in average.

After the second operation, all patients were treated with a long arm splint and the Kleinert protocol was performed on the post 3rd day. In the Post-operative 4th week, a short arm splint was performed and it was followed for 2 more weeks with the splint. At the end of 6th week, the splint was terminated and the active movement was released and directed to the FTR for rehabilitation purposes. The mean follow-up period for the patients was 34 months (12-70 months). TAM and Strickland scores were checked in the last controls of the patients. Patient satisfaction was questioned.

Findings: According to the Strickland score: 1 patient was classified as excellent, 5 patients were classified as good, 2 patients were acceptable and 2 patients were classified as poor. According to TAM: 2 patients were evaluated as excellent, 5 patients were good, 1 patient was acceptable and 2 patients were evaluated as poor. We did not have a patient with a worse outcome than the pre-operative situation. When patient satisfaction was questioned, we concluded that 6 patients were satisfied, 1 patient had moderate satisfaction, and 3 patients were not satisfied.

Result: In flexor tendon incisions; 2-stage tendon reconstruction force should be considered in the treatment of cases whose primary repair is not possible, whose soft tissue support and tendon bed has been excessively damaged or for which the desired range of joint motion cannot be provided after primary repair. And it should be kept in mind that patient compliance is essential because of the fact that this treatment is long-term, because it includes a number of additional surgical procedures and it contains physical therapy rehabilitation modalities. 2-stage tendon reconstruction surgery produces very successful results with appropriate patient and appropriate rehabilitation.

OP-50**The cause of a rare hand pain: Schwannoma case presentation with median nerve placement**

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Schwannomas originating from Schwann cells surrounding peripheral motor, sensory, cranial, and autonomic nerves almost everywhere in the body make up about 5% of all benign soft tissue tumors. Approximately 20% of all schwannoma cases are located in the peripheral nerves. Although it can be seen at all ages, it is most common between 20-50 years and the ratio of female to male is 2:1. 20% of Schwannoma cases are median, ulnar or radial nerve localized. They usually grow slowly, and the symptoms depend on the pressure that the mass makes to the surrounding tissues.

Case Presentation: A 64-year-old male patient referred to the hospital with complaints of left hand pain and numbness. The patient who had no systemic complaint stated that he had been operated on with a carpal tunnel syndrome in another institution he referred to with the same complaints, but there was no change in his complaints. On physical examination, there was a sign of healed operation scar in conformity with open carpal tunnel relaxation on the left hand palmar surface. No features were found in the hand and wrist examinations of the patient; With Phalen, Wartenberg and Froment tests, Tinel findings were negative and there was no sensory impairment. However, during the palpation of the forearm, an area with severe pain was detected in the volar surface and hand 1st finger. The Tinel finding in the same area was also positive. The patient's VAS score was 70.

Peripheral nerve sheath tumors are benign tumors originating from Schwann cells and were first identified by Verocay in 1908. 20% of all schwannomas are located in the peripheral nerve. Although schwannomas rarely show malignant transformation, White et al. reported this rate as 18%. Schwannomas are capsular and smoothly restricted tumors. Histopathologically, they show a biphasic pattern. The Antoni A pattern is with long nucleus, consisting of sequential, spindle-shaped cells forming fascicles and strips. However, the Antoni B pattern is hypo cellular areas with a weak myxoid

matrix and few fusiform cells. Oval acellular areas surrounded by parallel nuclei known as Verocay cistern can be seen. Histopathologic examination of our case showed Antoni A and Antoni B areas consisting of sequential, spindle-shaped cells with nucleus, forming fascicles and strips compatible with schwannoma.

OP-51**Effectiveness of thrombocyte rich plasma injection and dermal matrix substitute wrapping with decompression surgery in prevention of carpal tunnel syndrome recurrence**

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Approximately 30 percent of the patients who undergo decompression surgery in the treatment of carpal tunnel syndrome return with recurrence. The occurrence of recurrence is caused by early-late adhesions and fibrosis. Current studies conducted to reduce this rate are about nerve wrapping methods to isolate the median nerve from peripheral tissues or ultrasound guided thrombocyte-rich plasma (PRP) injection around the nerve to positively affect tissue regeneration. Our aim in this study was to investigate the effectiveness of reducing these recurrences by combining these two treatment methods. In our study, 10 patients with moderate-to-severe carpal tunnel syndrome were divided into two groups and the first group was treated only with decompression surgery and the second group was treated with collagen elastin dermal substitute wrapping and PRP injection in addition to decompression surgery. Preop, first and third month neurophysiologic values and VAS pain scale were compared. Compared with EMG results, we obtained significant results in the second group ($p = 0.048$). The improvement in VAS in the second group was also greater than in the first group ($p = 0.012$). So the combined treatment is a more effective treatment option by preventing fibrosis and early adhesion.

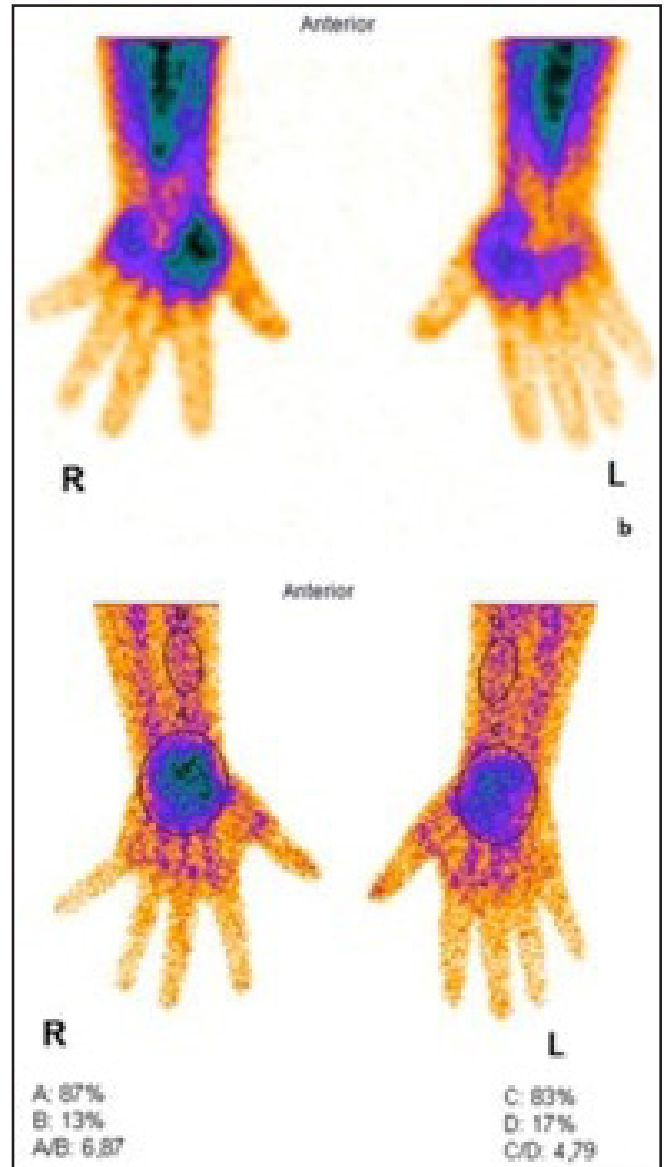
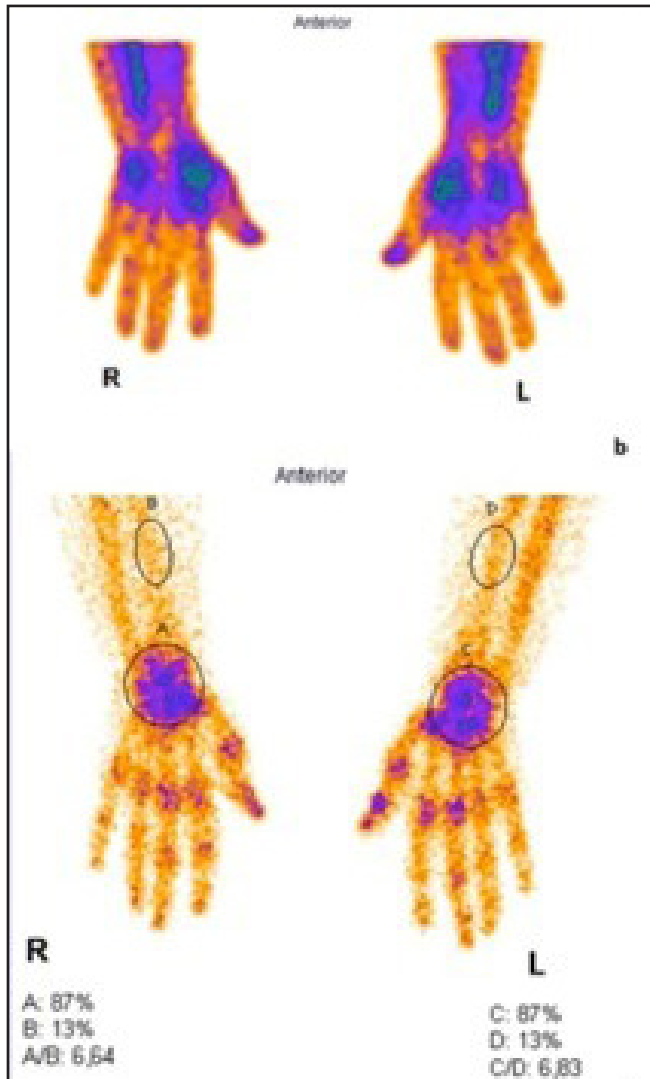
OP-52

A new method in the diagnosis of carpal tunnel syndrome: Three phase bone scintigraphy

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Objective: The main sympathetic vasomotor source of the hand is the median nerve. In patients with carpal tunnel syndrome (CTS), the effect of autonomic sympathetic innervation disorder due to median nerve damage on hand circulation is not known. If the chang-



es that the CTS creates on the hand circulation can be detected, a new method of making the CTS diagnosis will be achieved. In this study, we aimed to determine the changes of circulation on the wrist bones constituting the carpal channel created by autonomic sympathetic innervation disorder caused by CTS by using three-phase bone scintigraphy and to use scintigraphy for the diagnosis of CTS.

Material - Methods: A total of 108 hands (87 affected and 21 unaffected hands) of 54 patients with idiopathic CTS (age range: 27-65 years of age, gender: 17 males, 37 females) were examined in the study. A regional three-phase bone scintigraphy was performed

with $^{99m}\text{Tc-MDP}$ to examine the changes in the wrist bones. Blood flow, blood pool, late phase images were evaluated qualitatively and quantitatively in regional three-phase bone scintigraphy. For quantitative evaluation, fields of interest from the wrist and radius were drawn in bone phase images to obtain counting indices. Bone scintigraphy values were used for the same patient in comparison with the affected hand by accepting unaffected hand control.

Findings: Increased radiopharmaceutical involvement was observed in all three phases of the three-phase bone scintigraphy in the carpal bones region of the affected side of 21 patients with single sided CTS (unilateral CTS) (Figure 1). A statistically significant difference was found between affected and unaffected hands when evaluating late phase images in this patient group quantitatively ($p=0,002$). However, there was no significant difference in radiopharmaceutical involvement in all three phases of three-phase bone scintigraphy in the carpal bones region in patients with double sided (bilateral) CTS (Figure 2). When the late phase images were quantitatively assessed, no statistically significant difference was observed between the two affected hands ($p= 0,079$).

Result: In patients with CTS, changes in the circulation of carpal bones can be detected by three-phase bone scintigraphy. By detecting these changes, three-phase bone scintigraphy can be used as a method that can be used for carpal tunnel diagnosis.

OP-53

Prospective evaluation of preoperative and postoperative sleep quality in carpal tunnel release surgery

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Purpose: We aimed in our study to explore the impact of CTS surgery on sleep after median nerve decompression has been achieved by excluding other parameters that may affect the sleep pattern.

Materials and Method: We included in our study 101 wrists of 91 patients who had presented to our Orthopedics and Traumatology polyclinic with CTS symp-

toms. These patients' medical histories had been taken and their physical examinations completed, after which electromyography (EMG) was performed and those with advanced EMG results on whom median nerve decompression was performed were recruited into the study. Of the 91 patients with severe EMG findings who had undergone median nerve decompression, 9 patients were excluded from the study because they had a case of bilateral CTS, 10 were excluded because they had not come to their follow-ups, 21 because they had diabetes mellitus, 3 because they had been diagnosed with rheumatoid arthritis, 3 because they were taking pregabalin or gabapentin due to peripheral neuropathy, 2 because of a diagnosis of sleep apnea syndrome and their need for insomnia treatment, while 1 patient was excluded due to the use of narcotic derivatives and 1 because of the use of psychotic drugs. The 41 patients ultimately included in the study were not cases of post-traumatic CTS. Median nerve decompression was achieved in the patients with a limited palmar incision and performed by a single surgeon. Prior to and following the surgery, and in the 3rd and 6th months, the Pittsburgh Sleep Quality Index (PSQI), the Semmes-Weinstein Monofilament Test (SWMT), the Two-point Discrimination Test (2PDT), and the Boston Carpal Tunnel Syndrome Questionnaire (Levine-Katz) used for assessing the severity of symptoms and functions were administered.

Results: Age distribution among the patients was 33-75 years (55.54 ± 9); 12 of the patients were males (20.3%) and 29 (70.7%) were females. Among the individuals with an advanced EMG finding, the total sleep score of all before the surgery indicated a severe case of sleep disorder (total sleep score >5). Postoperatively, 30 of the 41 patients had reached a normal sleep score. The preoperative global PSQI score of the patients was 14 (10 - 19), but this receded to 10 (6 - 13) in the 3rd month postoperative and to 6 (3 - 10) in the 6th month postoperative. It was also observed that the patients' Boston symptom and function scores similarly decreased. In the review of the PSQI subgroups and total scores, it was seen that there had been a significant improvement in all of the scores in the 3rd and 6th months compared to the preoperative testing, ($p<0.001$). In the review of the patients' Boston function and symptom scores, it was observed that there had been a significant improvement in the hand functions and symptoms as from the postoperative 3rd

month to the 6th month compared to the preoperative testing ($p < 0.001$). In the review of the patients' TPDT and SWMT results, it was observed that there had been a significant improvement in the sensations of all the fingers tested as from the postoperative 3rd month to the 6th month compared to the preoperative testing ($p < 0.05$). Looking into the preoperative intragroup correlation between TPDT and SWMT and the PSQI global and subgroup scores, no significant correlation was observed between preoperative and postoperative scores ($p < 0.05$).

Conclusion: By excluding in our study many illnesses that have an impact on sleep quality, we observed that following median nerve decompression, the improvements patients experienced in their symptoms and in their sensations increased the quality of their sleep. We further confirmed through our statistical analyses that PSQI was an applicable test that can be used as a quantitative follow-up parameter after surgery and that improvement was not limited to the first postoperative 3 months but continued up until the 6th postoperative month.

OP-54

WALANT or Bier block? A prospective cohort study for patients' perspective on anesthesia type for carpal tunnel surgery

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Objectives: Regional intravenous anesthesia with upper arm tourniquet (Bier block) has been used for many years for carpal tunnel surgery (CTS). Recently, wide awake hand surgery (wide awake local anesthesia no tourniquet - WALANT) has been increasing its popularity for many of hand surgery procedures. In this study, we aimed to compare patients' satisfaction about these two different anesthesia methods.

Methods: Patients' carpal tunnel release were performed either with WALANT (epinephrine 1:100,000, lidocaine 1%, and bicarbonate %8.4) or with Bier block

(lidocaine 1%, bicarbonate %8.4) anesthesia methods. Patients were requested to fill the patients' satisfaction form after the operation. In the form; patients' were appealed to quantify their pain levels on visual analog scale, asked to compare the operation with dental procedures and their expectations, and questioned for their desires about re-operation with the same anesthesia method when needed. The results were compared for two anesthesia methods.

Results: There were 34 patients operated with WALANT and 24 patients operated with Bier block anesthesia methods. There were no significant differences between the mean ages (WALANT 48.6, Bier block 52.4) and the median pain levels (during local anesthesia injection, during surgery, and during the postoperative first day) of the two groups. The Bier block patients reported moderate tourniquet pain (median level was 5 on visual analog scale). When compared with dental procedures; 88% (30/34) of the WALANT patients, and 42% (10/24) of the Bier block patients reported the CTS to be an easier procedure ($p < 0.0001$). When compared with patients' expectations; 94% (32/34) of the WALANT patients, and 50% (12/24) of the Bier block patients reported the CTS to be an easier procedure than they expected ($p < 0.0001$). For the re-operation when needed; 97% (33/34) of the WALANT patients, and 50% (12/24) of the Bier block patients reported their desire for the same anesthesia method ($p < 0.0001$). Five patients were operated bilaterally (one side with WALANT, and the contralateral side with Bier block), and all of them reported WALANT anesthesia method definitely as a better experience.

Conclusion: WALANT anesthesia method offers a better patients' satisfaction and experience for CTS than Bier block. This is mostly related with tourniquet pain of Bier block patients. Nowadays, many surgeons prefer WALANT anesthesia method for a wide variety of hand surgery procedures.

OP-55

Outcome of one portal endoscopic decompression in radial tunnel syndrome: A new technique

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Background: Radial tunnel syndrome (RTS) is compression of posterior interosseous nerve (PIN) causing pain on proximal of dorsal forearm. In this study, we aimed to present outcomes of one portal decompression of posterior interosseous nerve in patients with radial tunnel syndrome and concomitant lateral epicondylitis.

Method: Data's of 10 patients(4 males, 6 females) operated for RTS and concomitant lateral epicondylitis between 2015-2017 were evaluated retrospectively. Clinical results of patients was evaluated with Roles-Maudsley criteria, Quick DASH and Mayo elbow scores.

Results: In final follow up, using the Roles and Maudsley criteria, 5 patients had excellent result (50%), 3 good result(30%), one fair(10%) and one poor result(10%). DASH and Mayo scores were improved from 50.0 to 6.8($p<0,005$), 52.5 to 87.5($p<0,009$) respectively. Most of patients were satisfied from the surgery in terms of the symptom relief and improved functional state. We encountered complications in two cases. The first was an isolated 3th finger extension lag that recovered satisfactory after a side to side extensor digitorum communis tenodesis procedure and the second was a transient neuropraxia that was fully recovered in 3 months without any intervention.

Conclusion: Diagnosis of RTS is often missed and patients treated as lateral epicondylitis. Patients with persistent pain despite conservative treatment are candidate for surgical intervention. The patients with concomitant lateral epicondylitis, it has been recommended to treat both disease in same time to have better results. Many open surgical approaches were described in literature. To best our knowledge, retrograde endoscopic decompression has not been reported previously. Endoscopic decompression has advantages in terms of small incision, less soft tissue damage and faster recovery. Care should be taken about complications during learning curve.

OP-56

Correlation of time with postoperative sensory recovery in carpal tunnel syndrome patients with sensory impairment

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Purpose: Study to understand the correlation between the time and postoperative sensory recovery in patients have Carpal Tunnel Syndrome with sensory impairment.

Materials and Methods: The data of 46 Carpal Tunnel Syndrome patients with sensory impairment (operated by same surgeon)were retrospectively analyzed. The persistent sensory deficits of the first three digits (thumb,index and middle fingers) were measured using the Semmes-Weinstein monofilament test before and after surgery. According to the test results, the levels of recovery of the sensory deficits were compared.

Findings: 41 patients(% 89,1) were female and 5 (% 10,9) were male of the total 46 CTS patients. The median age was 55 years. The most common range was from 55 to 64 ages. 30 (%65,2) patients underwent to surgery on right hand and 16 (%34,8) patients underwent to surgery on left hand. The median value of the arrival time of the patients to the first postoperative visit were 55 days. 12 (26.1%) patients had diabetes mellitus. According to the test results, the speed of sensory recovery in the proximal phalanx of the thumb and third finger was more significant than in the other parts ($p<0.05$).

Results: Recovery of sensory impairment after surgery in the hands of patients with Carpal Tunnel Syndrome correlates with time and time correlation is more significant in proximal phalanx of the fingers rather than distal .

OP-57

Cubital tunnel remodeling for cubital tunnel syndrome; Is a future's technique for ulnar nerve compression?

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Objective: For cubital tunnel condition, there is little to guide the choice of one surgical technique rather

than other. The least disturbance to the nerve would be expected in the anatomical position, posterior to the epicondyle in a more comfortable-remodeled bed.

Materials-Methods: We operated on 14 patients for ulnar neuropathy at cubital tunnel. Average follow up period was 7.5 years. In situ decompression was done and then periosteal soft tissue was peeled from anterior towards posterior of tunnel. With spinal gouge, groove was deepened, widened and reformed and faced towards posterior. We used bone wax to protect from new bony spur formation. The ulnar nerve is replaced into this new remodeled groove and confirmed to be stable throughout the full range of elbow motion. Patients were allowed to begin active movement of the elbow in a ten days. The results of these 14 patients were compared with 6 classical anterior transpositions methods with same criteria, all were made by same surgeon. Regular x-ray and MRI evaluations were done for volunteer, remodeled patients at average 7.5 years followed up.

Results: All 14 patients were relieved of discomfort and all had complete recovery of function. The ulnar nerve showed no evidence of irritation or adhesion. There is no heterotrophic ossification, fracture, or bony spur in the ulnar groove. Operated side powers and sensations were almost equal with un-operated side. Besides, classical anterior transfer patients were had some discomforts, unhappiness and weakness than normal side.

Conclusion: A correctly replaced nerve will not form adhesions in the new reconstructed-remodeled groove, because it is surrounded by loose areolar tissue. Although current classical techniques have their important disadvantages like higher rate recurrences, it was not seen any recurrence with ulnar groove plasty. We believe that this anatomical position is optimum for the nerve and this procedure would be an essential for treatment of cubital tunnel syndrome in the future.

OP-58

Endoscopic decompression of ulnar nerve; mid-term results

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Objective: In this study, mid-term results of patients who underwent endoscopic decompression of the ulnar nerve due to cubital tunnel syndrome were evaluated retrospectively.

Method: Cubital tunnel syndrome was diagnosed clinically and electrophysiologically. Twelve elbows of 11 patients from 16 patients who underwent ulnar nerve endoscopic loosening were evaluated. The severity of the patients' complaints before surgery was assessed in four stages by Goldberg modification of McGowan classification. Results were evaluated using the pre-op and post op Turkish Quick-DASH, postop modified Bishop and Wilson Crout scales.

Results: According to Modified McGowan classification, 3 patients were classified as Stage 1, 2 patients were Stage 2A, 3 patients were Stage 2B, and 3 patients were Stage 3. 5 of the patients were female, 6 were male, 7 were right, 5 were left-handed. The mean age was calculated as 28.5 (15-51) years and mean follow-up was 30.4 (9-51) months. 6 patients had dominant extremity, 4 patients had non-dominant extremity, and 1 patient had both extremities. It was seen that the Quick-Dash score, which was 66.6 in the preop period, decreased to 4.98 after surgery. According to modified Wilson Crout scale, 7 patients were very good and 4 patients were good. The postoperative mean Modified Bishop score was calculated 9.8.

Discussion: In cubital tunnel syndrome, decompression of the affected nerve is necessary in conservative treatment-resistant patients. Surgical treatment options include open or endoscopic decompression, medial epicondylectomy, and anterior transposition of ulnar nerve. Patients with mild, moderate, and short-term symptoms usually prefer simple decompression, while patients with advanced and long-standing symptoms tend to have anterior transposition. We think that endoscopic decompression may be preferred in findings patients without elbow deformities and osteoarthritis with mild and moderate disease symptoms. In this method, which is suggested to have lower risk of postoperative complications, the use of a smaller incision has advantages of less postoperative pain and shorter time to return to work. The disadvantages are that the learning curve is long and special equipment is required.

OP-59**Investigation of the incidence of carpal tunnel syndrome in female office workers**

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Objective: Carpal tunnel; at the level of the wrist, the median nerve that provides feelings and movement on the fingers of the hand, and a narrow tunnel-shaped structure of the tendons that move our fingers. Carpal tunnel syndrome is a disturbance that causes complaints such as numbness, tingling, loss of strength and pain in the case of median nerve compression in this tunnel. It is more common in women between the ages of 40-50 and who use excessive repetition of the wrist. This study was planned to investigate the incidence of Carpal Tunnel Syndrome (CTS) in office workers who frequently use the wrist.

Materials and Methods: A total of 36 office worker women aged between 33 and 47 were included in the review. Individuals' working time and paresthesia entity were questioned. The Semmes-Weinstein Monofilament Test (SWMT) was used to assess sensory symptoms. Tinel and Phalen tests were used to help diagnose CTS. Visual Analog Scale (VAS) was used for pain questioning. Jamar Digital Hand Dynamometer (JDHD) was used for manual strength assessment. The Michigan Handicap Questionnaire (MESA), which questioned general hand function, daily life activities, work performance, pain, external appearance and satisfaction, was used to question illness level and functionality.

Results: It was observed that the daily working time changed between 6-9 hours. There was a significant correlation between the daily working time and the hand strength and paresthesia obtained from the right hand. There was a significant relationship between the duration of daily work and Phalen-Tinel tests on the right hand. There was a significant relationship between daily working time and job performance. Age with MESA scores; right hand paresthesia, and Phalen-Tinel tests; again a significant relationship was found between the MESA scores and the Phalen-Tinel tests on the left hand. Semmes-Weinstein monofilament test scores were significantly correlated with study duration.

Advice: It was determined that there was a meaningful relationship between MESA scores, SMWT, JDHD results, and the tests used in the CTS and the results of the daily working period triggers the findings of the CTS. When the studies in the literature are examined, it is seen that the CTS risk is higher in the occupations that require the movement of the wrist over the repetitive and normal motion angle. We believe that ergonomic training, strengthening and protective exercises for occupational groups will be helpful in reducing CTS complaints.

OP-60**Osteoid osteoma with proximal phalanx placement**

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Objective: Examination of the osteoid osteoma with proximal phalanx placement.

Case: The first case was an 18 years old male patient who has been complaining of pain in his right hand finger for 1 year. He has referred to many different centers. However, no exact diagnosis has been made. MR and CT scans were performed on the nidus-like appearance on the X-ray taken. The location of the nidus was clearly identified and surgically removed. Clinically, complete improvement was seen. The second case was a 19-year-old male patient who had referred to various centers with pain in his left hand index finger for 2 years. As a result of the imaging made for the patient, nidus was removed and clinical improvement was achieved. Unlike the other two cases, the third and fourth cases were cases to which biopsy was applied with bone tumor preliminary diagnosis. However, pathologic diagnosis could not be made with materials not appropriately taken. As a result of the imaging made, the location of the nidus was determined. An incision was made. Full clinical improvement was achieved.

Conclusion: In conclusion, it will be more appropriate to diagnose osteoid osteoma by adequate radiological examination and to make surgical planning according

to the location of nidus. The patients showed quite a good clinical improvement with complete removal of the nidus. CT and MR imaging is very useful for making a diagnosis and planning a surgery. However, further evaluation may not be necessary if the nidus is adequately shown on a direct radiological examination. The primary purpose of the surgery is full excision of the nidus.

OP-61

Peripheral nerve sheath tumors in upper extremity: Our Clinical experience

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Objective: Peripheral nerve sheath tumors are rare soft tissue tumors. It is generally encountered as slowly growing subcutaneous masses. It can cause neurological symptoms such as pain, numbness and Tinel mark positivity. They are mostly benign, originating from Schwann cells, but rarely malignant ones can also be seen. In this report, we present the cases in our clinic where we treat the patients with peripheral nerve sheath tumors.

Material - Method: Nine patients who were treated with peripheral nerve sheath tumor on the upper extremity between 2015 and 2018 were retrospectively studied. The patients' ages, sexes, location of lesions in upper extremity, symptoms, and the nerve where they originate, histologic witnesses and postoperative follow-ups were recorded.

Findings: 9 patients were treated, 5 of whom were males and 4 of whom were females. One of the lesions was found in the arm, 4 in the forearm, 2 in the hand, and 2 in the fingers. Other than subcutaneous mass complaints, there was an ailment of pain in 6 patients and an ailment of numbness in 3 patients, and Tinel test was positive in 4 patients. One of the masses was originated from axillary nerve, 3 of them from radial nerve sensory branch, 1 from median nerve, 2 from ulnar nerve and 2 from digital nerve. Pathological diagnosis of 8 patients was reported as benign schwannoma and of 1 patient as malignant peripheral nerve sheath tumor. Excision could be performed in 7 patients without fascicular lesions. In 2 patients, fascicular excision

was made together with mass and repair was performed with nerve graft. On the 15th day postoperatively, 3 patients had numbness and 1 patient had motor deficit. All symptoms improved in 3 month follow-ups.

Result: In extremities, in the differential diagnosis of subcutaneous masses, peripheral nerve sheath tumors must be definitely considered. Neurological complaints and symptoms, such as pain, numbness or Tinel test, are not required. Radiological examinations are helpful in diagnosis and treatment planning. The aim of the treatment is to excise the mass without permanent nerve deficit, and for this, it is very important to perform be careful and attentive dissection with microsurgical techniques in a non-hemorrhagic environment.

OP-62

A rare localization of gout: Distal ulna

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Objective: Gout disease is a kind of arthritis which produces crystals in the joint, resulting in a swollen, red and painful joint. Almost all joints may be influenced with the big toe being the most common. In this study, we present a gout case localized in the distal ulna which is an extremely rare localization.

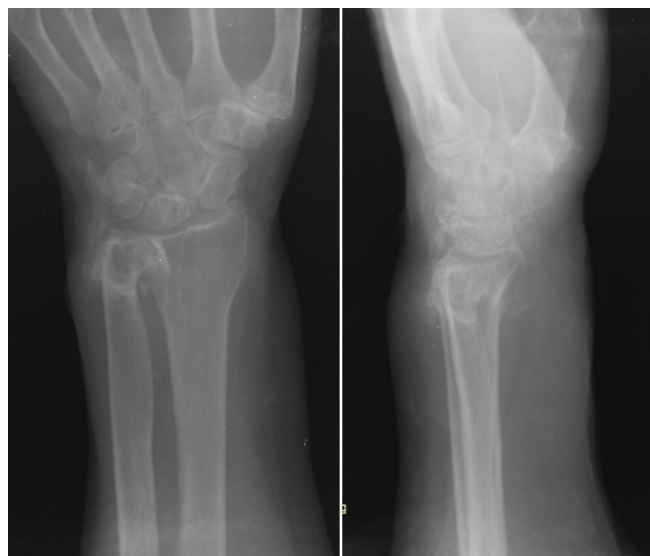


Figure 1. Direct graph showing fracture and goute involvement in the distal ulna.

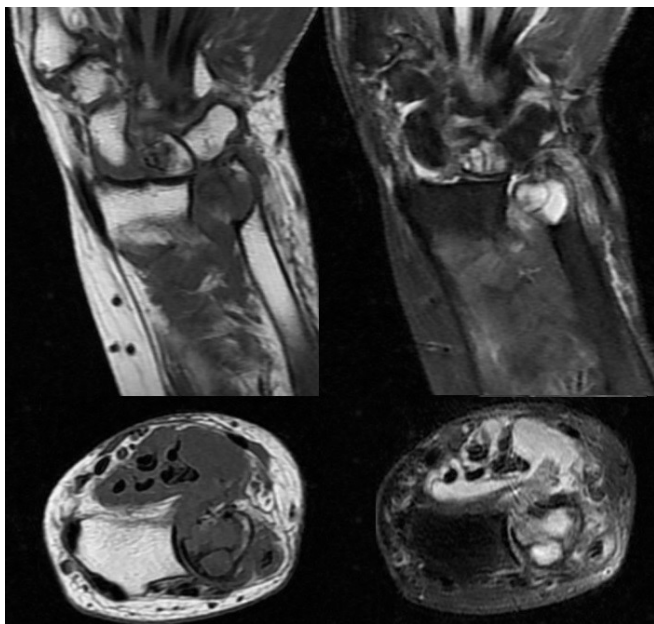


Figure 2. Coronal and axial T1A and T2A magnetic resonance sections depicting involvement in the distal ulna and collection within the carpal tunnel.

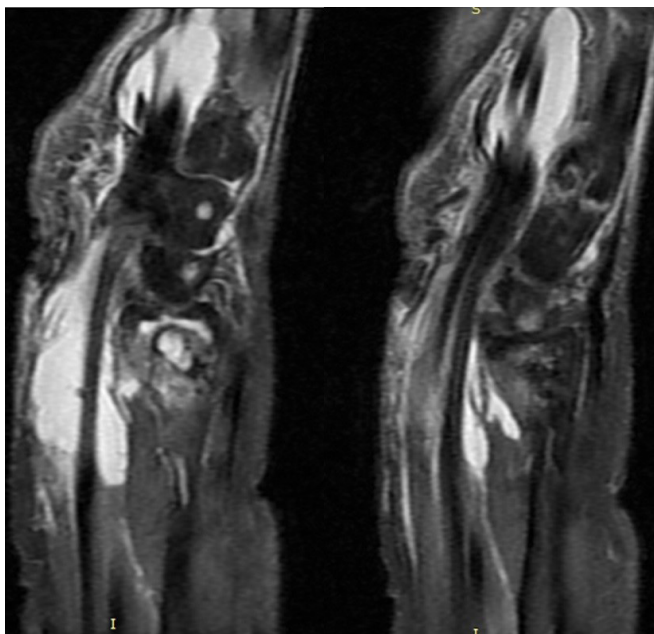


Figure 3. Sagittal magnetic resonance images showing intense involvement in volar aspect of the wrist.

Case report: A 72-year-old female patient presented with the complaints of pain, swelling, and increased temperature in the right wrist, motion restriction of the wrist, and restricted extension in the fingers for about 1.5 months.

Relatives of the patient reported that a mass lesion has

been found in the right wrist in an outer center 3 years ago, and it has been stated that the lesion should be followed-up. However, the patient had not attended to the controls. Direct graphy and magnetic resonance imaging revealed involvement in the distal ulna and carpal tunnel. Sedimentation was found as 32 mm/h, C-reactive protein as 41 mg/L. Total protein was 6 g/dL, and uric acid was 4.7 mg/dL.

Incisional biopsy was performed in the patient. Macroscopic view of the lesion suggested gout. The frozen examination was reported as compatible with gout. Debridement and carpal tunnel relaxation were performed, and the wrist was splinted. The patient was referred to rheumatology clinic for medical treatment.

Conclusion: Distal ulna localization of gout disease is quite rare. Because it may involve almost everywhere especially big toe, gout disease must be definitely considered in the differential diagnosis.

OP-63

Classification of distal finger tumours

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Purpose: This study aims to define a new classification system by dividing the distal finger into zones according to their anatomical formations and natural boundaries, to determine the histopathologic diagnosis of the finger tumours presenting in these regions and examine the tumour distribution according to these zones.

Methods: Between January 1995 and February 2016, 61 patients with distal finger tumours and tumour-like lesions in Uludag University Faculty of Medicine, Department of Hand Surgery, were retrospectively evaluated. The distal fingers were divided into zones to classify the sites of the cases according to anatomical formations; zone 1 and zone 2. Zone 2 was subdivided into zones 2a, 2b and 2c. The lesions originating from interphalangeal joint of the thumb and distal interphalangeal joint of the other fingers, and the surrounding soft tissue were included in zone 1. The nail and surrounding structures were evaluated as zone 2a, distal phalanx as zone 2b, finger pulp as zone 2c. The

distribution of the distal finger tumours according to these determined anatomical zones was studied.

Results: The most common pathology observed was a glomus tumour (41%, n:25) followed by giant cell tumour of the tendon sheath (GCTTS) (31%, n:19). The most common bone tumours were enchondromas (6.5%, n:4). According to our distal finger tumour classification, majority tumours and tumour-like lesions were located in zone 2a (nail complex; 44%), followed by zone 1 (joint and surrounding soft tissue; 30%), zone 2b (10%) and zone 2c (11%). The most common tumour lesion according to the identified zones was GCTTS in zone 1 and zone 2c, glomus tumour in zone 2a and enchondroma in zone 2b.

Conclusion: The widespread use of this classification system could provide an idea of the possible pathologies when encountering a patient with a distal finger mass; thereby enabling more accurate surgical planning.

OP-64

Management of nodular and proliferative fasciitis localized in the upper extremity

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Objective: In this study, we present a case series of upper extremity localized fasciitis which is a rare tumor group. We aimed to retrospectively analyze patients' demographics, clinical findings, radiological investigations, treatments, and treatment outcomes.

Material & Methods: Patients diagnosed with upper extremity localized fasciitis, and treated in the orthopedics clinic of our hospital between 2006 and 2016 were retrospectively evaluated.

All patients' medical history, physical examination, PA chest graphy, MRI examination of the affected extremity, and routine laboratory analysis were studied. After the operation was performed, the pathological material was assessed by an experienced soft tissue pathologist.

Patients were evaluated in terms of diagnosis age, primary tumor localizations, signs and symptoms, tumor size, type of the surgical procedure, and treatment failures.

Statistical analysis was carried out using SPSS 22.0 statistical software (SPSS, Chicago, IL, USA). Descriptive statistics are expressed as mean \pm standard deviation, frequency, and percentage.

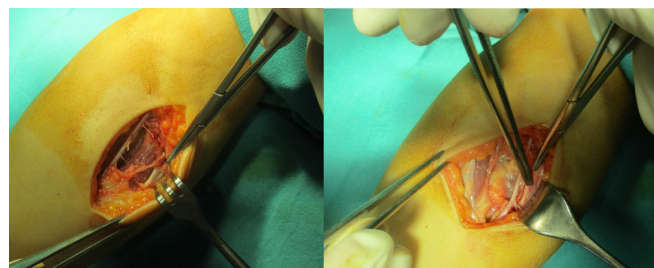
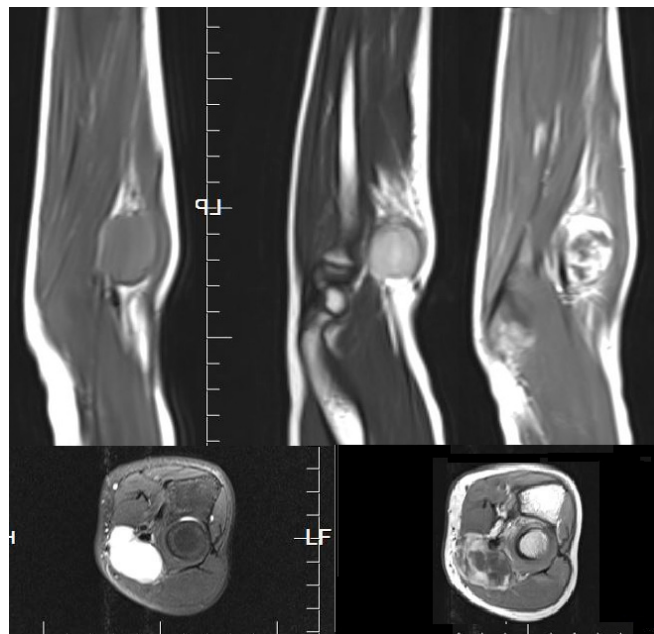
Results: The mean age of diagnosis was 34.2 ± 20.1 (9 – 52) years in 3 female (75%) patients and 1 male (25%) patient.

All patients presented due to primary tumor and had localized disease at the time of diagnosis.

The lesions were elbow localized in two patients, shoulder localized in one patient, and forearm localized in one patient. All patients presented with a soft tissue mass. The mean mass size was 3.7 (2-7) cm.

All patients underwent local excision. The mean follow-up time was 71 (24 – 140) months. None of the patients developed complication or recurrence during follow-up.

Conclusion: Upper extremity localized fasciitis is rare,



and may be seen within a wide range of age. Surgery of the lesion showing neurovascular proximity is challenging. Outcomes following total excision which is performed for the treatment are excellent.

OP-65

Bizarre parosteal osteochondromatous proliferation (nora lesion) resembling chondrosarcoma in distal phalanx of an adult secondary to trauma in childhood

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Objective: Bizarre Parosteal Osteochondromatous Proliferation (BPOP), which resembles osteochondroma, is defined as reactive heterotopic ossification originating from periosteum on the bone surface. The lesions commonly develop on short tubular bones of adult foot and hand in third and fourth decades. In its etiology trauma is determined in 30% of cases. The lesions depicting aggressive features in radiological and histological examinations can erroneously be diagnosed as sarcoma. Local recurrence rates up to 60% have been reported. Here, we report the difficulties in diagnosis and the outcome of BPOP, developing after injury to the distal phalanx of an adult and managed by operative treatment, with one year follow-up regarding literature.

Case Report: Thirty-three year old male was admitted due to complaints of pain and deformity at the distal end of right middle finger. The patient reported pro- peller injury which had occurred at the age of nine. Medical history did not include previous admission or professional medical care for the injury. He mentioned awareness of the slowly enlarging, hard mass during last last six years and pain on only holding objects using the fingertip which had been continuing for 1.5 year.

On examination, scarring on the skin and immobile, hard mass with mild tenderness on volar aspect of right middle finger distal phalanx were noticed. An irregularly shaped radiopaque mass with wide base on volar surface of the distal phalanx and its border on the cortical bone could be seen on lateral radiographs. CT imaging

demonstrated an osseous lesion with irregular borders and dimensions of 10x7.5 mm at the distal phalanx. The lesion was T1a isointense, T2a hyperintense in MRI. With respect to the preliminary diagnosis of bone tumor, operative treatment was opted for the patient. Marginal excision of the mass was executed. Immunohistochemical analysis indicated Nora lesion; however, the possibility of low grade chondrosarcoma could not be excluded. Three-phase bone scintigraphy revealed increased uptake only in distal phalanx of right middle finger. After consulting to Medical Oncology, out- patient follow-up visits were planned for the case. The patient was symptom-free and the findings in physical as well as radiological examinations were unremarkable at the last visit which was one year after the operation.

Conclusion: BPOP is a lesion of bone surface and seen as reactive proliferative process or benign tumor. Histologically, lesion contains bone, cartilage and spin- dle cells in different amounts. Metacarpal, metatarsal, proximal and middle phalangeal bones are typically involved. The lesion can demonstrate continuity with cortical bone in radiographs but medullary continuity is generally absent. Osteochondroma, osteosarcoma and chondrosarcoma should be considered in the dif- ferential diagnosis. Marginal excision is efficient in the treatment.

OP-66

Upper extremity localized Nora's lesion: Analysis of 2 cases

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Objective: Bizarre parosteal osteochondromatous proliferation (BPOP), also called Nora's lesion, is a rare benign lesion showing exophytic growth from bones. In this study, we aimed to evaluate two patients with Nora's lesion in the upper extremity.

Material & Methods: One male and one female, two patients aged 29 and 27 years respectively and had forearm localized lesions were included in the study. Patients' time to diagnosis and symptoms, clinical findings, tumor size, MRI findings, surgical treatment, treatment outcomes, and complication were studied.



Figure 1. Antero-posterior and lateral X-rays of the left radius origin Nora's lesion in 29-year-old male patient showing irregular contoured lesion with exophytic growth from the bone toward the soft tissue.

Results: First patient had radius origin and the second had ulnar origin lesion. Both patients were diagnosed with biopsy, and underwent total excision. No recurrence or complication was seen at 35 and 24-month follow-ups.

Conclusion: Bizarre parosteal osteochondromatous proliferation (BPOP) is a rare bony lesion which may be localized in many different regions of the body, had a benign character, but may be encountered with frequent recurrence. A careful total excision performed with a good preoperative planning, is the most important key in prevention of recurrence.

OP-67

Determination of the effects of the shoulder area surgeries in pediatric patients with obstetric brachial plexus palsy (OBPP) on osseous remodeling and periscapular muscles: Magnetic resonance study

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Objective: As it is known, internal rotation contractures of the shoulder region developed in follow-up of pediatric patients with Obstetric Brachial Plexus Palsy (OBPP) can cause glenoid and humerus head dysplasia, as well as gleno-humeral joint (GHE) posterior subluxation and dislocations. In cases of patients with OBPP who underwent early surgery, the long-term effects of shoulder area osseous remodeling on GHE dislocation and the development of periscapular muscles (> 2 years) were examined in the accompaniment of magnetic resonance (MR) images.

Method: 14 pediatric patients with OBPP who under-

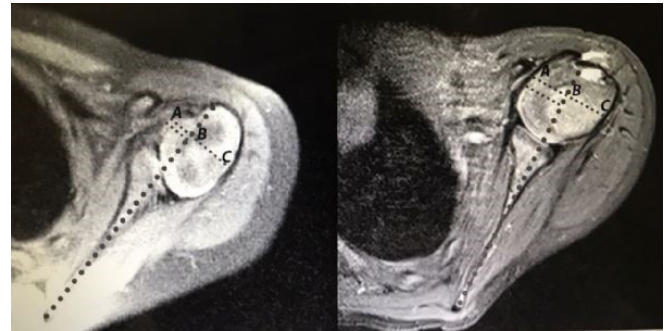


Figure 1. In the figure, significant changes are shown in the PHBA parameter (at the end of the follow-up period, values close to 0.5 were obtained in AB / AC Ratio).

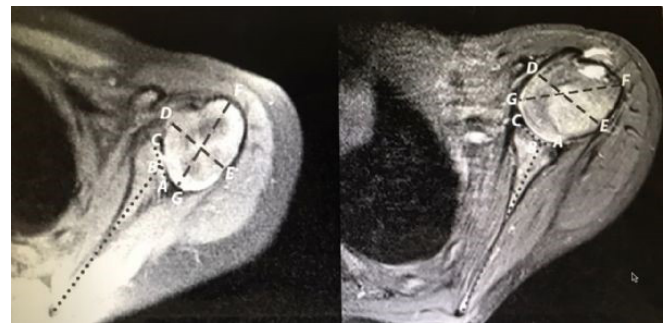


Figure 2. In the figure, significant changes are shown in the Glenoid Version (GV) and Elliptical Index (EI) parameters in terms of remodeling at the end of the follow-up period (GV is calculated according to the scapular body method and is evaluated by showing with angular value type and with negative data of retroversion, and EI states the fact that DE / GF values approach 1 and that the humeral head has gained a more rounded morphology. (DE: shortest humeral head width in transverse sections, and GF: longest humeral head width in transverse sections).

went secondary shoulder surgery (tendon transfer and joint reduction) and ages ranging between 5 and 11 years (mean: 6.4) were inspected retrospectively. Proximal humeral head anterior ratio (PHBA) was used to evaluate subluxations in MR scans. Changes in the glenoid version (GV) that have been measured were examined in terms of being able to see the response of glenoid dysplasias to surgical treatment and the elliptic index (EI) changes were examined in terms of the responses of the humeral head dysplasia to surgical treatment. The subscapularis (SS) and external rotator (DR) muscle groups were also examined spatially in MR cross-sections in order to evaluate the changes in muscle volume in the shoulder region.

Findings: From the parametric changes investigated, the GV and EI values showed statistically significant ($p < 0.05$) improvement, very close to the shoulder values of the healthy and solid side. GV and EI values after treatment showed such an improvement that no statistically significant difference was found between the side with palsy and the healthy side shoulder values. Despite the fact that significant and positive changes are observed after surgery in terms of PHBA and SS, these values cannot reach the values of the healthy side. The most negative results in the study were obtained in the DR changes.

Result: According to the results obtained in the study, it can be stated that with early secondary shoulder region surgeries applied in patients with OBPP accompanied by shoulder problems, remarkable osseous remodeling (in GV and EI parameters) are provided in long term follow-ups, thus the head of the humerus attains a rounder form and the glenoid attains a more antevert status. It should also be noted that concentric rehabilitations in GHE subluxations and obvious volumetric increases in internal rotator muscle groups (SS) were obtained. A concentric and functional shoulder joints can be obtained with surgeries in patients with OBPP accompanied by shoulder problems and follow-ups.

OP-68

The effect of the shoulder surgery on osseous remodeling and on the periscapular muscles in pediatric patients with obstetrical brachial plexus palsy (OBPP): A magnetic resonance imaging study

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Objective: In OBPP patients, who underwent early surgical interventions, the shoulder is examined by magnetic resonance imaging (MRI) for the long-term (> 2 years) effects of the surgery on the osseous remodeling, GHJ dislocation, and the development of periscapular muscles.

Method: The study was conducted retrospectively with 14 pediatric patients with OBPP in ages ranging from 5 to 11 (average:6.4), who underwent secondary shoulder surgery (tendon transfer and joint reduction). The ratio of anterior proximal humeral head (APHH) is used to evaluate subluxations in the MRI. The measured glenoid version (GV) variations and elliptical index (EI) changes were examined to evaluate the response of the glenoid and humeral head dysplasias to the surgical treatments, respectively. In order to evaluate the muscle volume changes in the shoulder, the subscapularis (SS) and external rotator (ER) muscle groups were examined in the cross-sectional areas by MRI.

Results: Of the examined parameters, the GV and the EI values showed statistically significant ($p < 0.05$) improvements, achieving very close values to those of the intact shoulder on the other side. Although meaningful and positive changes were observed in the APHH and SS parameters, those values could not achieve the levels measured on the intact side. The most negative results of the study were obtained in the changes observed in the ER muscle group.

Conclusion: Based on the results of the study, we may report that the application of secondary surgical interventions to the shoulder of the patients with OBPP in the early stages provided significant osseous remodeling (in the GV and EV parameters), therefore, the humeral head became more rounded and the glenoid fossa became more anteverted. In addition, it would be correct to say that concentric improvements in the GHE subluxations and significant volumetric increases in the internal rotator muscle groups (SS) were obtained.

OP-69

Rare seen complication in reverse shoulder arthroplasty: Separation of component

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Aim: Although total shoulder arthroplasty (TSA) complication ratio is similar to other joint arthroplasty complications ratio (%15), reverse shoulder arthroplasty (RSA) complications are so much and variable. RSA implantation increased at last 20 years. It's complication ratio is increased because of it is not anatomic, using in rotator cuff rupture that can not be repaired and geriatric population. the most seen complication is notching (%40) and aseptic loosening (%10). Complication of separation of implant is %4. There is not enough case report in literature and we aim treatment of complication like that.

Case: Eighteen years old, woman patient, came our polyclinic with limitation of movement and ache at her shoulder. In her history she had a shoulder prosthesis operation at another hospital 2 years ago. At physical examination she had ache and limitation of movement and pathological movement at her right shoulder. Neurovascular examination was normal. There was an incision line at shoulder's anterior lateral. At her two side x-ray graphy there was reverse shoulder prosthesis and it was separated from body and diaphysis combination. Revision RSA with same brand prosthesis set was planned. Prosthesis was reached from old incision line. So much metallosis was seen and debrided intraoperative. The screw that combined prosthesis's body and diaphysis component replaced and found in soft tissue. These separated components were combined, with rotation control using a new screw. Then screw space was filled with bone cement to prevent the recurrence.

Conclusion: At patients who need reverse shoulder prosthesis implants which has minimum components, have to be chosen. RSA implants that have two or more components have to be chosen with controlling preoperative pieces's reliability. If an implant was chosen like that, components that combines the interface have to be controlled if they fixed tight or not.

OP-70

Finite element analyse of capitellum type 1 fracture fixation with headless cannulated screw with 4 different combination

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Aim: To simulate biomechanical behaviour of capitellum type 1 fracture fixation with different screw inclinations and compare displacement of proximal and distal fracture parts by finite element analyze

Background: Displaced capitellum type 1 fracture needs surgical treatment. Screw placement and screw direction still controversial

Methods: Geometric data of capitellum was obtained by using 3D printer at Gebze High Technology University. This primer data was transferred to HyperMesh for geometric correction and mesh cross-linking. The thickness of the epiphysis and diaphysis was measured by computed tomography as 2.5 mm and 6.5 mm. The element thickness was taken as 1mm TET4 when capitellum was modeled. Structural analysis of capitellum has been utilized for both epiphyseal and diaphyseal linear elastic material models. We pre determined screw inclination scenarios case 1, case 2, case 3 and case 4. We have applied 4 altered forces 50 Newton- 300 Newton thorough different angles (0-160) The displacement histograms in the distal and proximal fracture fragments in 4 different screw inclination are listed in the ANSYS general endoprocessor. Relative displacements between the distal and proximal parts were calculated by measuring the total displacements in the X / Y / Z planes from 16 different points.

Results: Statistical analysis was run on Minitab 17 software package. When the displacement results are examined according to the screw inclination, it is seen that the data do not fit the normal distribution and exhibit variance inequality. Johnson Transformation was transformed into a normal statistical fit for a more powerful statistical analysis of applied data. This transformed data was used to investigate the screw inclination and force

relationship on displacement using the general linear model. According to the modeling, the displacement at 4 screw inclination is significantly different for force and case factors when examined under 4 altered forces. According to the analysis, there is no interaction between force and case. Case 2 * 300Newton pair significantly stands out more different than others to the other combinations force * screw inclination graph ($p < 0,05$)

Conclusion: Finite element analysis show that angled screw applications have better results than parallel ones. $> 2\text{mm}$ intra-articular step – off generally accepted for development of arthrosis. Because of this very important issue hardware should maintain anatomical correction till fracture would heal.

OP-71

Comparison of extracorporeal shock wave therapy and wrist extensor splint application in lateral epicondylitis treatment; Prospective randomization study

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Objective: Extracorporeal shock wave therapy (ESWT) and wrist extensor splint (EES) are two commonly used methods of lateral epicondylitis treatment. In this study, the efficiency of 2 methods has been compared.

Material - Method: The study was planned as a prospective randomized controlled study. Sixty-seven patients were evaluated. ESWT-applied patients were divided as group I (32 patients) and EES patients as group II (35). Group I underwent 4 sessions of ESWT treatment, with 1 session per week. ESWT device was used in each session at 10-12 Hz frequency, 2000 pulses, 1.6-1.8 bar pressure. The wrist splint, which held the Group II wrist at 30-45 degrees extension, was applied for 4 weeks. Both groups were given isometric and eccentric exercises for wrist and forearm strengthening. Patients were assessed for grip strength, resting pain, work pain and quality of life. Evaluation data were collected before and after treatment (in the weeks 4, 12 and 24). The visual analogue scale (VAS) was used for resting and running pain, the hand dynamometer for grip strength, the short form SF-36 sub-parameters

for assessing quality of life, the Turkish version of the questionnaire of the function of the hand affected during various activities (PRTEE-T) in daily life, Nirschl scores were used to assess pain of the affected arm during exercise.

Findings: Although both the ESWT and the EES group showed significant improvements in our evaluation parameters in weeks (4, 12, 24) compared to before treatment (resting-work pain, grip strength, PRTEE-T score, Nirschl score, and in the sub-parameters of SF-36 (general health, physical functions, physical role weakness, emos role strength, social functions, body pain, mental health and vitality) ($P > 0,05$), there was no statistical difference in our evaluation parameters between the two groups ($P < 0,001$) in the (4, 12 and 24) weeks.

Result: ESWT and EES applications were found to be significantly superior when they were compared to pre-implementation values. Nevertheless, there was no significant difference in the comparison between the two groups. However, EES implementation is more advantageous in terms of cost and ease of implementation

OP-72

Our surgical results with the medial approach for elbow contracture

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Introduction: Elbow stiffness or contracture; loss of range of motion, is a pathology manifested difficulty in performing everyday activities. Etiology includes post-traumatic and inflammatory pathologies. Treatment options include physical therapy and surgery. Surgical options are arthroscopic and open surgery so far there is no accepted gold standard surgery treatment. Open surgical options include anterior, lateral and posterior approaches. In recent years, the medial approach has become popular because it provides a wide surgical areas and is being used frequently.

Purpose: In our cases: we evaluated patients treated open medial approach for joint range of motion and daily movement functions.

Method: 17 cases treated with medial approach between 2012 and 2017 were evaluated. The cases were 60 % male, 40 % female. Preoperative mean range of motion was between 50° - 90°. The daily activities of the patients were assessed by the Mayo performance index scale. Preoperative Mayo performance index 60 points. Medial approach was used in all cases and at the same time ulnar nerve transposition or relaxation was performed. On the 1st postoperative day, the movement started with the flexion and extension splint.

Result: Postoperatively, the mean follow-up was 20 (8-60) months and mean range of motion was 25° - 120° (0°-140°). The Mayo performance index during the follow-up was 90 (70 -100) points. There were complaints of ulnar nerve with postoperative follow-up activity in 2 cases but there was no ulnar nerve complaints in daily use. Keloid revision was performed on 1 case of keloid secondary pain and complaints were released.

Conclusion: Medial approach in elbow contracture is a good choice. It provides a wide surgical approach. It has a low complication rate. It has good clinical outcomes and patient satisfaction is good.

OP-73

Long head of triceps transfer to gain elbow flexion in 15 patients

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Objective: Elbow flexion is the most important function of the upper extremity, hence loss of this function leads a major disability. Elbow flexion deficit can be seen in both congenital (arthrogryposis) and acquired (traumatic/obstetric brachial plexus palsy) conditions. We describe our results for the surgical technique of the transfer of the long head of triceps to biceps in traumatic and congenital cases.

Method: We performed this transfer in 15 patients, ages between 2-45 years. 6 adult patients were suffering from traumatic brachial plexus injury while 9 young patients had arthrogryposis or obstetric brachial plexus palsy. We reached the long head of triceps by performing median dorsal incision. After anterior transposition of the ulnar nerve; the tendon of the long head of triceps is incised at the level of olecranon. Then this tendon is

passed medially under the ulnar nerve and attached to biceps tendon by pulvertaft technique. The elbow is stabilized by a cast in 90 degrees. After immobilization for 4 weeks the cast is changed and the patients were sent to the physical therapy and rehabilitation unit.

Results: We achieved 90-120 degrees of elbow flexion while preserving elbow extension in patients with obstetric and traumatic brachial plexus palsy and 60-90 degrees of elbow flexion in arthrogryptic patients. All patients were happy to gain hand to mouth function. Elbow extension deficit were acceptable in acquired cases while in arthrogryptic cases since shoulder abduction is not expected, partial triceps power loss almost never effects daily living of these patients.

Conclusion: Although there are many muscle transfer methods (lat dorsi, pectoralis etc.) to reanimate elbow flexion, we conclude that long head of triceps to biceps transfer is a reliable technique in both acquired and congenital cases.

OP-74

Early clinical and radiological results of cases of patients to whom inverted shoulder arthroplasty was applied due to rotator cuff arthropathy

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Objective: We aimed to evaluate the early period results of the cases of patients to whom inverted shoulder arthroplasty was applied due to rotator cuff arthropathy.

Material - Method: The cases of the patients to whom we applied inverted shoulder prosthesis with humelock reversed® implant were assessed retrospectively in advanced age cases with pseudoparalysis who have shoulder pain who do not respond to conservative treatment and rotator cuff arthropathy is irreparable. The cases to whom inverted shoulder arthroplasty was made due to trauma, tumor, conversion or revision, for whom different type of implant system has been used, who have a follow-up period shorter than 12 months and who do not have sufficient medical documentation were excluded from the evaluation. In the last follow-up of the cases who were included in the study, the pain was questioned by using vas and joint motion span was

measured. Constant and quick dash scoring system has been used in clinical assessment. The position of implants, the presence and degree of scapular notching, the problems related to components were researched radiologically. The complications were noted.

Findings: 9 of the 28 cases who were included in the assessment were males (32 %), 19 of them were females (68 %) and the mean age during the operation was 71 years (58 – 90) and the follow-up period was 21 months in average (13 -38). In cases where component problem did not arise, the vas mean in the last follow-ups was 1,5 (0-4), active flexion towards the front was measured as 132' (100-160) in average, abduction was measured as 96' (70-125) and external rotation as 33' (10*50). Constant and quick dash scores were 54 (46-69) and 42,2 (13,6-84,3) in average respectively, and the difference was meaningful when compared with pre-operation values ($p < 0,05$). Scapular notching developed in one of the cases, glenosphere disintegration in two of them, humeral diaphysis fracture during surgery in two of them and post trauma humerus fracture in one of them. Component loosening was not detected in any of the cases and dislocation or periprosthetic infection was not observed. In the follow-up period, 3 cases (10,7) were operated again due to glenosphere disintegration or traumatic fracture.

Result: The clinical results of the inverted shoulder arthroplasty applied in the treatment of cases with an irreparable degree of rotator cuff arthropathy are successful. The problems developed during this application which enables the elimination of the pain and correction of the functions can be eliminated with the improvements in the implant technology.

OP-75

How effective is the upper extremity function of the elbow joint in children with obstetric brachial plexus paralysis?

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Introduction: Obstetric Brachial Plexus Paralysis (OBPP) is a clinical tablage due to injury to the brachial plexus during birth. Muscle strength, range of motion and upper extremity functioning are the main factors in evaluating OBPP. In our study, our aim was to determine the relation of elbow joint range of motion and muscle strength to upper extremity functioning.

Methods: Our study included between 4 and 14 years of age children with OBPP. range of motion of joint were assessed by goniometric measurement, muscle strength by manual muscle testing, and upper limb functioning in Turkish, reliability and validity Brachial plexus outcome measurement (BPOM) -total total and elbow sub-head scores.

Results: A mean age of 8.66 ± 2.402 (min-max=4.5-14) years of 20 (38.5%) girls and 32 (61.5%) boys were included. Joint movement tolerance values; elbow flexion $122.77 \pm 21.304^\circ$ (min-max= 50° - 145°), elbow extension $-11,19. \pm 15,80^\circ$ (min-max= 0° - -55°). Muscle strenght elbow flexion was 4.13 ± 0.658 (min-max= $2+5$), elbow extension was 3.65 ± 1.106 (min-max= $0-5$)/5. The BPOM-tr total score was 39.92 ± 9.632 (min-max= $17-52$) and the elbow sub-title was 16.64 ± 2.758 (min-max= $7-20$). There was a statistically significant relationship between BPOM-tr total score ($r=0.396$; $p=0.005$) and BPOM-tr elbow sub-heading score ($r=0.309$; $p=0.033$) There was no correlation between BPOM-tr total ($r=0.208$; $p=0.155$) and BPOM-tr elbow sub-title ($r=0.266$; $p=0.068$) with elbow flexion muscle strength. There was no statistically significant difference between the functional range and the range of motion of the elbow joint (flexion, $r=-0.032$; $p=0.831$ /extension, $r=-0.144$; $p=0.333$).

Discussion: Elbow functions are effective in the use of the upper extremity in daily living activities. While the elbow extensor muscular strength function is related, there is no flexor muscle strength. BPOM-tr is also reflected more in the elbow lower head, but less in the BPOM-tr total score. We think that the presence of elbow flexion in upper extremity use is related to these results.

OP-76

Shoulder septic arthritis occurring in newborn with brachial plexus paralysis clinic; Case report presentation

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Introduction: Despite the fact that septic arthritis is common in newborns, shoulder septic arthritis is a rare condition. Septic arthritis in the pediatric patient is manifested by findings of infection in the affected extremity and pseudo paralysis. Septic involvement of the shoulder joint may occur with brachial plexus paralysis or radial paralysis clinic.

Case: A 10-day-old newborn baby girl was brought to the external center of orthopedics and traumatology polyclinic once and once to the orthopedics and traumatology polyclinic of our hospital with the complaint of immobility in the upper right extremity. Because physical examination findings were compatible with brachial plexus paralysis, -recommendations were made for this and follow-up was recommended. Two days after referring to the polyclinic, the infant was brought to the pediatric emergency department again with the same complaint. A detailed systemic orthopedic examination of the patient revealed swelling, increased temperature and redness in her right shoulder. The patient with high infection markers was found to have a right shoulder dislocation in the X-ray image taken. Superficial ultrasonography was reported in the shoulder joint as a liquid with dense content. In the ponction made in the Emergency Department, it was seen that the aspirated content was pus. Arthrotomy was performed to the patient, and the joint was rinsed and debrided. Debridement was repeated 3 days later upon the continuation of the discharge and due to the fact that there was no decline in infection markers. Antibiotic treatment was regulated for the patient due to s aureus growth in the culture samples that was taken. The patient's infection values returned to normal limits on postoperative 15th day. It was seen that active upper limb movements measured at postoperative 6th month returned to normal when compared to the contralateral extremity. In the X-RAY image that was taken, the shoulder joint was evaluated natural. The right humerus did not develop shortness when compared with the counterpart. EMG review that was made was reported as normal.

Result: Shoulder septic arthritis is rarely seen in the newborn and appears to be clinically similar to brachial plexus paralysis or radial nerve paralysis. For this reason, it is possible to delay or skip the diagnosis. Early diagnosis and treatment are very important because

delayed diagnosis and treatment leads to shortness of the humerus, loss of joint movement and permanent paralysis. For this reason, shoulder septic arthritis in the upper extremity paralyzes of the newborn should definitely be considered in the differential diagnosis.

OP-77

Investigating of anterior shoulder instability in minibus drivers

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Aim: Minibus drivers are at risk for anterior shoulder instability due to their frequently used 'money extension position' (shoulder extension, abduction and internal rotation). In our study, we aimed to evaluate this risk.

Materials and Methods: Our study conducted with 40 people, age between 18 and 50, which are ; 20 minibus drivers as a study group and 20 healthy people from irrelevant occupations. JTECH The Commander PowerTrack II hand dynamometer was used to assess shoulder abduction [m.deltoideus (middle fibers)] and shoulder hyperexcitation (m.latissimus dorsi) and internal rotation (m.subscapularis) muscle strenght of participants. The 21-item The Western Ontario Shoulder Instability Index (WOSI) was used for shoulder instability evaluation.

Findings: Mean values of shoulder abduction muscle strengths of study and control groups were 107.36 ± 7.02 Newton (N); 102.48 ± 9.7 N, shoulder hyperextension muscle strengths 97.28 ± 6.1 N ve 95.32 ± 7.45 N, shoulder internal rotation muscle strengths 112.2 ± 6.4 N ve 105.54 ± 5.42 N, respectively. Average values of WOSI-physical symptoms subscores (10-item) of study and control group were 470 ± 76.4 and 180 ± 62.57 , WOSI-work scores (4-item) were 260 ± 42.8 and 110 ± 24.6 , WOSI- life style (4-item) scores were 290 ± 72.6 and 75 ± 22.25 , emotions subscores (3-item) were 160 ± 3 and 36 ± 10.72 ; total WOSI scores were 1180 ± 13 and 401 ± 85.7 , respectively.

Results and Conclusions: As a result of our study, the values of muscle strength of shoulder abduction, internal rotation and extension were found to be

higher in minibus drivers than healthy controls and there is a significant difference ($p < 0.05$). When all instability scores are examined, there is a significant difference between the groups ($p < 0.05$). Compared to healthy volunteers, this elevation in the instability scores seen in minibus drivers is an occupational risk factor. WOSI is thought to be occupational deformation, especially due to this difference in physical symptoms, job score, lifestyle scores. Minibus drivers perform repetitive shoulder movements, and especially abduction, internal rotation and hyperextension movements frequently increase the strength of these muscles but also increase the instability risk factor. In order to prevent this risk, exercises should be recommended to prevent imbalance between muscles that will increase anterior instability and muscles that will stabilize by pulling posteriorly.

OP-78

Prevalence of sesamoid bones of hand in Turkish population

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Aim: Pathological conditions of Sesamoid bones are usually underestimated and diagnosis can be neglected. Anatomy of the normal structure must be well known for proper diagnosis. Sesamoid bones show a high rate of variance between populations. In this study, we aim to detect the distribution of sesamoid bones at Turkish population and their zones in the hand.

Material-Method: Antero-posterior and oblique views of hand x-rays of 772 adult patients (405 female, 367 male, ages 18-81) were retrospectively analyzed at 3 centers, between 2010-2012. And distribution of sesamoid bones in the hand is noted.

Results: Prevalence of a sesamoid bone is detected as %100 for thumb metacarpophalangeal (MCP) joint, %45 for 2nd MCP joint, %1.6 for 3rd MCP joint, %0.1 for 4th MCP joint and %76 for the 5th MCP joint. Thumb inter-

phalangeal joint sesamoid prevalence is %23.

Conclusion: Prevalence of sesamoid bones at adult Turkish population and their distribution at the hand is investigated. These findings will be beneficial for clinical practice.

OP-80

Inter-observer reliability of water immersion ultrasonographic technique used to examine morphometric properties of thenar muscles: Pilot study

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Objective: Thickness and anatomical cross-sectional area (ACSA) parameters of thenar muscles are frequently used in ultrasonographic techniques because of their low cost and practical use. The complicated shape of hand and the superficial location of the structures adversely affect the application of the exact contact technique, which is routinely used in ultrasound evaluation. Compaction of the tissues and artifacts in the exact contact technique cause difficulties in the analysis process and therefore cause a loss of time. In this study, the morphometric parameters of thenar muscles were examined and the reliability of the water immersion technique is tested. In addition, this study is a pilot study to establish the reference values of the morphometric parameters of the thenar muscles.

Material and methods: Eleven female participants with a mean age of 52.9 (± 9.45) were included in the study. 8-10 MHz linear probe of the Shimadzu SDU 1200-Pro ultrasonographically system was used in the study. Longitudinal imaging to measure the thickness of opponens pollicis (OP) and abductor pollicis brevis (APB), first dorsal interosseous (FDI) and adductor pollicis (AdP) muscles; transverse imaging for thicknesses of and ACSA measurements of FDI and AdP muscles was performed. All evaluations were performed by two different observers and inter-rater reliability was calculated. The images were repeated 3 times for each position, and the average of the measurement results was obtained.

Table 1. Inter-observer reliability table.

Muscles	ICC
APB longitudinal thickness	0,970
OP longitudinal thickness	0,983
AdP	
longitudinal thickness	0,961
transverse thickness	0,946
ACSA	0,908
FDI	
longitudinal thickness	0,997
transverse thickness	0,942
ACSA	0,920

Conclusions: The morphometric examination of the APB, OP, AdP and FDI muscles performed by ultrasonography revealed that the inter-observer reliability was excellent and highly satisfactory (max: 0,997; min: 0,908; $p < 0,001$).

Limitations: The small sample group may be the limitation of this study.

OP-81

Association between PAI-1 4G/5G polymorphisms and non-traumatic avascular necrosis of lunatum

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Purpose: Osteonecrosis of the lunate bone (Keinböck's Disease) is an ischemic injury that results in necrosis of the subchondral bone, collapse of the carpal bones, and degeneration of the wrist. Since described by Robert Keinböck in 1910, the etiology of Keinböck's disease is still unknown. PAI-1 is a critical factor that regulates coagulation and fibrinolytic systems. Reduced plasma fibrinolytic activity is related with increased levels of PAI-1. PAI-1 4G/5G polymorphism is

related and responsible for recurrent miscarriage, myocardial infarction, cerebrovascular diseases and femoral head avascular necrosis in literature. In this study, we aimed to detect the role of PAI-1 4G/5G polymorphism in non-traumatic avascular necrosis of lunatum.

Methods: After the ethics committee approval and written consent forty-five lunatum avascular necrosis patients were received and forty-five healthy individuals with similar demographic characteristics as the control group were included in the study. Genomic DNA was extracted from peripheral blood samples to determine the distributions of PAI-1 4G/5G polymorphism by allele specific pcr and sequencing in patient and control groups.

Results: We identified eight(17,8%) 4G4G, twenty-six(57,8%) 4G5G, eleven(24,4%) 5G5G PAI-1 genotype carriers in patients and five(11,1%) 4G4G, twenty-one(46,7%) 4G5G and nineteen(42,2%) 5G5G PAI-1 genotype carriers in healthy subjects. There was no statistically significant difference for distributions of the gene polymorphism between patients and control groups ($p=0,187$). Furthermore, 4G allele increased risk of AVN 2.26 fold than 5G allele in Keinböck's disease with no statistical differences (OR=2,259; %95CI [0,917 - 5,562]; $p=0,076$).

Conclusion: 1,6 fold increased 4G homozygote genotype was identified in the patient group. Although no statistical associations were documented for PAI-1 4G/5G polymorphism in Keinböck's disease, large-scale studies should be designed to clearly identify these associations in our population.

OP-82

Plantar fibromatosis frequency of palmar fibromatosis diagnosed patients

Çağla Çiçek

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Objective: Palmar fibromatosis (Dupuytren's Disease-DD) is a condition that affects palmar fascias but can be affected by other structures in the body together with fibroplasmic predisposition. Peyronie's Disease (PD) in which corpus cavernosum is affected and plantar fibromatosis (Ledderhose Disease -LD) affected by plantar fasciitis are other clinical conditions that can be

seen together. In our study, the frequency of LD that can be accompanied by patients who were being treated due to DH was investigated.

Material and Method: Twenty-four patients who were referred to our clinic for DD were included in the study by their demographic datas. Twenty-one patients with operation indications were evaluated for the presence of plantar fibromatosis

Results: When the demographic data of 24 patients evaluated for DD were examined, it was determined that 20 were male and 4 were female. The average age of the patients included in the study was 62.3 (57-78). None of the patients had a family history with a similar clinical condition. All patients except 1 patient were affected with both hands. It was observed that unilateral or bilateral plantar fascias were also affected in 4 of the 21 patients who had surgical indications according to the metacarpophalangeal and proximal interphalangeal joints status. In all four patients with plantar fibromatosis, irregularity was detected at the arc of the foot; nodular formation was not observed on the medial face of the foot and and clawing of fingers

Conclusion: DD is a clinical condition that affects the fingers over time with the thickening of the fascia. It should not be forgotten that during the course of the disease, skin and deep structures may be indirectly affected. Although LD's etiology is unclear, it is less common than DD and is characterized by abnormal fibrous tissue formation in the plantar fascia. This situation, which is more common in males, is bilaterally 25%. However, in our study, the disease was bilaterally detected at a rate of 95%. This can be explained by the late referral of patients to the hospital. In a study in the literature, it was shown that 28% of patients with LD diagnoses were accompanied by DH. In our study, 19% of patients who were operated because of DD were accompanied by LD and were compatible with the literature. No patients were found to have complaints of LD, and because there was no finger involvement on the examination, operation decision was not made and follow-up was recommended at regular intervals. It should not be forgotten that DH may be combined with LD and may also be performed due to plantar fibromatosis in the direction of the patient's need.

OP-83

Hand surgeon - To be or not to be? That is the question. Compulsory health service experience of hand surgery in Turkey

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Objectives: Hand surgery has been a major theme throughout the education of orthopedics and traumatology (OT) along with plastic, reconstructive, and aesthetic (PRA) surgery residents. But, to work as a hand surgeon during compulsory health service (CHS) is a new topic for Turkey. We aimed to share the elective surgical experience of six hand surgeons during CHS in different centers of Turkey.

Methods: The hand surgeons who have already finished their CHS or were up to finish their CHS was requested to fill operation records (OR) form for elective procedures performed in the surgeon's usual daily practice. The records from all six surgeons were integrated.

Results: Five OT and one PRA originated hand surgeons were available for this study. Tendon procedures were the most commonly performed procedure (14.3%), followed by phalanx (10.6%), and then by nerve (10.4%) procedures. A small percentage (2.7%) of operations performed were beyond the scope of hand surgery. Simple procedures (trigger finger release, carpal tunnel release, foreign material extraction, ganglion cysts excision, de Quervain's tenosynovitis release) were comprising 20.9% of all the operations performed.

Conclusion: Hand surgery comprises a broad spectrum of disorders and requires a distinct fellowship period. Hand surgeons bear an important mission about basic hand surgery education of OT and PRA residents and encourage them to perform simple procedures. The possibility of team-work will definitely increase the interest for hand surgery and result in better outcomes for patients. Finally, we honestly declare that we feel satisfied with our special work and invite residents to walk together in this endless hand surgery road.

OP-84

Providing functional and aesthetic healing with MatriDerm® and late fat injection in frontal arm flexor face burn contracts

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Intro: Target reconstruction of burn contractures, optimal restoration of disease, functional socially and psychologically as well as collective reintegration of patients. In burn contracture surgery, scar excision, can be done, defects that occur due to breakage of contraction bands can be restored by full thickness skin graft (FTSG), partial thickness skin graft (STSG), local and remote skin flaps. In this study, it was aimed to demonstrate the effect of dermal equivalent (MatriDerm®) and late-stage fat injection on the functional recovery of burn contract disease.

Materials and Methods: 15 patients (aged 2 to 41) aged between 2 and 41 were treated with MatriDerm® and STSG and late-stage fat injection; FTSG was applied to the other 15 patients (group 2) and each patient group was followed up to 18 months postoperatively. In our study, we examined the functional and aesthetic consequences of closing the burns of the forearm flexor face with KKDG and MatriDerm®, as well as the injection of fat in the late postoperative period. In this procedure: the contracture lines in the upper extremity are first relieved incisionally and rigid and poorly organized tissue excision is achieved. MatriDerm® was then placed open and the STSG placed. The ROM of the patients were measured at one month intervals starting from the early period (1 week) in physical therapy and

rehabilitation with postoperative fat injections at the 3rd. and 6th. months respectively.

Results: During the follow-up period, ROM of the open joints at the small joints was found to be (MCP, PIP, DIP) 23.5 degrees to 77 degrees in 1st.group, 23.5 degrees to 70 degrees in in the 2nd. group; In group 1, the ROM was found to be 71.3 degrees to 106 degrees and in the second group 70 degrees to 100 degrees at the large joints. It was noted that relaxation was observed in both groups in the contracture lines where the flexor movement deficit was decreased in the first group after the late period fat injections. It was seen that the increase in skin elasticity and the speed of healing were more prominent in group 1.

Discussion & Conclusion: Recurrences, inadequate skin quality and flexibility are common problems after contracture surgery. In our study, we conclude that the combined use of MatriDerm® with STSG in the treatment of burn contracture has increased the skin's qualities, flexibility and visibility, making it more acceptable as a deep-seated appearance.

OP-85

Clinical evaluation of surgically treated 34 cases with polydactyly

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Objective: Polydactyly is one of the most common congenital anomalies characterized by extra fingers in hand and / or feet. Polydactyly can occur not only in the form of a simple finger duplication, but also in abnormal anatomical structures, joints, tendons and tendon insertions.

Material - Method: This study includes cases that were operated surgically due to polydactyly in İnönü University Research Hospital Orthopedics and Traumatology Clinic between 2011 and 2016. In this study, patients who were operated on in our center due to polydactyly were retrospectively reviewed: and polydactyly types, surgical methods that were applied, surgical results and residual deformities that occurred in the intermediate period were analyzed.

Findings: Twenty-four patients and 34 extremities with malformations were treated surgically. Three of the patients were adults and 21 were children. The patients' ages ranged from 1 to 20 years. The mean age at surgery was 5.6 years. The average follow-up period was calculated as 35 months. Lower extremity involvement (58%) was found to be higher than upper extremity involvement (42%). Percentages of preaxial and postaxial polydactyly types were 53% and 47%, respectively. Four of the cases (11%) were simple polydactyly, and 30 (89%) were complex.

In the surgical procedure, 19 complex polydactyly patients were treated with osteotomy and excisional methods while excision and ligament reconstruction were performed in 11 malformation cases with complex polydactyly. Four patients with simple polydactyly anomalies underwent simple excision.

Result: Our study showed that all patients were satisfied with postoperative functional and aesthetic outcomes except 1 patient. In the patient who was not satisfied with the result, complex preaxial polydactyly was present in the left foot. The patient was operated 4 years ago and excision and ligament reconstruction was performed. However, in the patient who developed hallux valgus deformity on follow-up, additional corrective surgery was needed. Except this patient, we did not have a patient who had an additional surgical need.

OP-86

Neonatal compartment syndrome

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Objective: Neonatal compartment syndrome is a rare condition manifested with ulcerated and necrotic lesions commonly seen in the upper extremity. Because it often imitates the skin lesions of the newborn, a delay is usually observed at the time of diagnosis. It should be recognized as soon as the child is born; and it is absolutely necessary for early fasciotomy, extremity and function protection.

The amniotic band syndrome seen in newborns mimics skin lesions of cases such as neonatal gangrene, aplasia cutis congenita, congenital varicella, epidermol-

ysis bullosa, subcutaneous fat necrosis and necrotizing fasciitis. Because it is rare, diagnosis is usually delayed. Skin lesions of neonatal compartment syndrome occur at birth and are observed in almost all cases.

Material and method: In this paper, we will present the results of 4 cases that we have performed due to neonatal compartment syndrome. Interventions were made to cases of 4 patients born or developed as a sequel with neonatal compartment syndrome ranging between 1 day old and 6 years of age. Splinting was applied in the early period during and post fasciotomy, and in the late period Z plasty and muscle relaxation operations were made.

Result: In neonatal compartment syndrome, skin lesions and decreased spontaneous movement in the upper extremity should be kept in mind. Emergency fasciotomy is the only treatment at the time of doubt. Good results are achieved with urgent fasciotomy. Operations increase functionality even if they do not contribute to finger lengthening. Necrosis and severe contractures are inevitable in those who are treated late.

Even though it is made at the appropriate time, recurrent flexion contracture was seen in cases without appropriate splinting after fasciotomy

OP-87

Treatment of cross bone deformity seen in split hand

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Objective: The transversal extension of any metacarpus that should be in longitudinal plane in split hand patients is called a cross bone. Cross-bone is a very rare anomaly associated with split hand and central polydactyly.

The cross bone causes the split hand to expand even further. By surgically removing this bone, a positive change in hand functions is aimed. If the cross bone is united with MKP joint, the joint capsule should be preserved and reconstruction should be definitely made for the continuation of joint stability after resection. A different treatment option is the preservation of the soft tissue around it and bringing it longitudinal plane.

When cross-bone deformity is placed in the first web, it should not be removed since it contributes to the formation of the web.

In this study, we aimed to discuss cross bone treatment alternatives and our results.

Method: 8 split hands were operated in 7 patients aged between 1.5 and 18. The distal part of the cross bone in 3 hands was preserved and it was totally excised in 5 hands. Progression of the splits of the patients, joint angulation and hand functions were observed for approximately 4 years (2-8).

Result: We observed that the removal of the cross bone helps in correcting the splitting on the hand and correcting the angulation in the fingers, and in some patients, a stable joint is generated for the combined rails by preserving the distal portion of the cross bone.

Hand surgeons should plan the operation by considering the advanced functions of the hand, such as phalangisation, finger growth, MKP joint stabilization, before removing the crossbones in their entirety.

OP-88

The relationship between handwriting legibility and wrist proprioception

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Purpose: The aim of this study was to investigate the relationship between handwriting legibility and wrist proprioception in healthy subjects.

Methods: 27 participants (13 female, 14 male) with a mean age of $21,03 \pm 2,8$ years were included in the study. The dominant hand of all participants was the right hand. Sociodemographic data of the participants were recorded. Wrist proprioception (for flexion, extension, radial deviation and ulnar deviation) was evaluated and handwriting legibility was assessed. Proprioception was evaluated accuracy in actively repositioning wrist joint at a predetermined target angle. Three measurements were made and the average of the error amounts of these measurements was recorded. Handwriting legibility was scored, on a scale from 1 (very poor) to 5 (very good), independently by two people. The average

of these scores was recorded. Significance level was accepted as $p < ,05$.

Results: There was moderate positive correlation between handwriting legibility and wrist proprioception for radial deviation ($r = ,505$ $p = ,007$). There was no statistically significant correlation between handwriting legibility and wrist proprioception for flexion, extension, and ulnar deviation ($p > ,05$).

Discussion: In the literature, studies that investigate the relationship between handwriting legibility and wrist proprioception are insufficient. In the study, determination of relationship between handwriting legibility and the wrist proprioception for radial deviation is important in terms of showing the need for a larger study about this issue.

OP-89

Hand enchondromas treated with injectable calcium phosphate cement

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Objective: The purpose of this study was to evaluate the results of enchondroma patients treated by curettage and then filling of the defect with injectable calcium phosphate cement.

Materials-Methods: 16 patients were included in this retrospective study. The radiological, clinical (pain intensity, range of motion) and functional outcomes (Quick-DASH, grip and pinch strengths) were evaluated.

Results: There was a significant reduction in mean pain scores postoperatively. All patients had full range of motion except 1 patient. New bone formation occurred in seven patients. Ectopic ossification, wound infection and recurrence were not observed in any patient. The mean Quick-DASH score was $7,3 \pm 11,9$ postoperatively. 90% recovery of grip strength and 85-100% of pinch strength were obtained.

Conclusion: Calcium phosphate cement is anticipated as a valuable alternative treatment method of hand enchondromas because of the lack of donor site morbidity, allowing early activity and providing good functional results.

OP-90

Are we carrying the amputate correctly?

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Objective: Replantation refers to the process of restoration of the circulation by stitching the chopped off limb with microsurgical methods.

74% of the replantation procedures are performed in large centers. Third-line hospitals accept 63% of all amputation cases and replant 81% of the cases they accept.

In this work, we aim to increase the awareness by sharing the errors made in the transfer of amputates referred to our clinic for replantation in the east of our country.

Case: A total of 6 total amputation cases admitted to Erzurum Regional Training and Research Hospital between October 2016 and December 2017 were included in our study.

Result: In the success of replantation, many factors are influential, as internal factors (patient-based), external factors (outside the patient) and mixed. The major factors regarding the patient are the type of amputation,

level of mechanization, age, additional trauma, chronic diseases, medication and smoking habit, whereas patient external factors include conditions and duration of transport of the amputate, time that lapses until the operation, surgical procedures (debridement, fixation method, number of anastomosis, graft use, etc.) and physical conditions (operating room conditions, microscope, microsurgery set, etc.). Mixed factors that affect success are revascularization and ischemia period.

While internal and mixed factors cannot generally be intervened, external factors have the chance of being intervened. Among the external factors, the only factor that the surgeon performing the replantation cannot intervene is the transport conditions of the amputate and the period of transportation. We therefore think that health rehabilitations need to focus on this issue.

The amputate should not be in direct contact with water or ice during transfer and a protective barrier that transmits the cold should be formed in between. After the chopped off limb is washed with a saline solution, it is then wrapped in a sterile gauze and placed in a plastic glove or bag that will transmit the cold. This package that is tightly bound is placed in a container filled with half water and half ice and it is made ready for transfer. The amputated part should be stored at 4 ° C for the time it is not being studied on, but it should never be frozen.



Figure 1. Examples of carrying the amputate incorrectly.

Replantation is a long and exhausting process for both the surgeon and the patient. No matter how much the surgical techniques and the physical conditions of the hospital are improved, it is not possible to achieve the desired results unless the first-level disruptions are rectified.

OP-91

Severe bone destruction in distal phalanx of hand due to penetrating injury by metal splinter: Inflammatory granulation tissue caused by foreign body

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Objective: Osteolysis associated with presence of foreign body within the bone suggests infection which is common. Aseptic granulation tissue due to foreign body can cause bone lysis as well. Infection may accompany the course. Sequential operations, even amputation, can be required in chronic and severe infections involving short tubular bones of adult hand and disability is a potential outcome. Here, we report the etiology and the result of operative treatment with one year follow-up of an adult case featuring severe bone destruction in distal phalanx of hand caused by metal splinter.

Case Report: An adult male was admitted upon complaints of pain and swelling in middle finger of right hand. The patient mentioned penetration of 1 cm long, steel wire to the finger three months before admission. Wound care had reportedly been applied without antibiotic treatment in an Emergency Department previously. The patient defined swelling in the finger lasting for one month. Physical examination revealed mild swelling and tenderness on palpation of the fingertip and finger pulp. Restriction of motion, redness and heat were absent. Laboratory findings included mildly elevated leukocyte count and normal levels of ESR and CRP. Radiographs revealed 2 mm long metal splinter which had penetrated the distal phalanx and extensive lysis in medullary canal. CT images demonstrated multiple fenestrations on the cortex and destruction in the medullary canal. Depending on preliminary diagnosis of osteomyelitis, operative treatment was opted

for the patient. With longitudinal incision on the finger pulp, volar aspect of the phalanx was exposed. Tissues causing lysis within the phalanx were curetted through cortical fenestrations before irrigation. Medullary canal was free of purulent material. Curetted tissues were sampled for microbiological and pathological examinations. Beads of bone cement with gentamicin were placed in the bone cavity and finger pulp. Pathological examination detected inflammatory granulation tissue, including giant cells, abundant in histiocytes and vascular formations. Chronic active inflammation and foreign body granulomatous inflammation were reported. The examination reportedly excluded chronic osteomyelitis. Microbiological examination with Gram staining revealed scarce Gram-negative bacilli. The culture result was negative. Two months after the first operation, the beads were removed and the cavity was filled with autogenous corticocancellous bone graft. At the twelfth month of follow-up, the patient was symptom free. Finger functions were excellent.

Conclusion: Although infection is the first diagnosis considered in case of bone destruction due to presence of metallic foreign body within the bone, foreign body related inflammatory granulation should also be regarded as differential diagnosis.

OP-92

Postural analysis in obstetric brachial plexus paralysis

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Objective: The purpose of this study was to analyze the posture of patients with obstetric brachial plexus paralysis (OBPP) and to examine their body parts affected by the lesion.

Material and Method: 30 (F / E: 16/14) children with OBPP were included in the study between October 2015 and May 2016. The demographic data of the cases were recorded. Patients older than 15 years who had previously undergone brachial plexus surgery were excluded from the study. Patients were divided into three groups as Erb Duchenne, Klumpke and Mixt type according to the area of the brachial plexus. New

York Posture Analysis Method (NYPAY) was used to perform posture analysis and Modified Mallet Scale (MMS) was used to evaluate functions related to mobility. NYPAY total score of 45 and above was evaluated as "very good", the score between 40-44 as "good", the score between 30-39 as "middle" and the score between 20-29 as "weak".

Results: The average age of participants was 5.86 years. 60% of the children was Erb Duchenne, 26.7% was Klumpke, and 13.3% was of mixed type. According to MMS, 46.7% of the patients had injury at grade 2, 4.3% at grade 3 and 10% at grade 4. 56.6% of the cases had a very good score of Erb Duchenne and NYPAY, 23.3% had a very good score of Klumpke and NYPAY, 13.3% had a good mix and NYPAY score was very good. When the NYPAY scores were only seen from the lateral side, there was a significant difference between the lumbar lordosis increase and BPP types ($p < 0.05$). The NYPAY score was very good and the distributions of 2nd, 3rd and 4th graders according to MMS were 46.6%, 40% and 6.6%, respectively. There was a significant inversely proportional relationship between MMS and NYPAY ($p < 0.05$). There were no significant differences between sexes and types for MMS and NYPAY ($p > 0.05$).

Conclusions: This study clearly demonstrates that the lesion of the brachial plexus not only affects the shoulder girdle but also the neck, spine, thoracic region, chest, hip and foot posture.

OP-93

The series of hand infection in patients with diabetes: Experience of 17 cases and pooled analysis of the literature

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Background/aim: The aim of this study was to report the clinical characteristics and the treatment outcomes of hand

infections in diabetic patients and to review the literature.

Materials and methods: The medical records of 17 patients with diabetic hand infections admitted to the Diabetic Foot Care Center of two different clinics from January 2012 to October 2017 were reviewed. To perform the pooled analysis, published series (32 studies) were searched in two international databases (www.scopus.com and www.pubmed.com).

Results: Of the 17 patients (mean age 61.7 ± 8.5 years), 8 (47.1%) were female. All cases were type 2 diabetes mellitus. The mean duration of diabetes was 9.0 ± 5.96 years and the mean HbA1c was $7.86 \pm 1.88\%$. There was necrosis in 8 patients (47.1%). The most common causes were injury during saw and hammer use in 5 patients (29.4%) and injury due to inappropriate nail cutting in 3 patients (17.6%). Nine (52.9%) patients were operated on. No patients underwent any major amputations or died. In 32 publications, 704 patients with diabetic hand infections were found. The average age was 53.43 years ($n = 591$) and 84.29% of patients (322/382) were found to have type 2 DM. The mean duration of diabetes was 4.12 years ($n = 317$) and the mean HbA1c was 10.58% ($n = 140$). The rate of surgical operation was 74.59% (323/433).

Conclusion: Diabetic hand injuries often occur when using hand tools such as hammers, saws, and knives, and when cutting nails. It is necessary to use conservative treatment rather than amputation. These patients should consult experienced health care professionals.

OP-94

Results of treatment of intra-articular distal radius fractures by using external fixator

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Objective: Assessing the outcomes of treating the radius distal end joint fractures by using closed reduction external fixation method.

Material and Methods: 41 intra-articular distal radius fractures of 38 patients treated in Department of

Orthopedics and Traumatology in Medical Faculty of Trakya University between September 1997 and December 2004 were retrospectively examined. All of the fractures were treated by using closed reduction and uniplanar radiocarpal external wrist fixator. The patients, who were invited for control, were assessed functionally and radiologically.

Results: According to the AO classification, 2 (4.8%) of 41 fractures of 38 cases were Type B, and 39 (95.12%) were Type C. 3 of the fractures were open ones. The distribution of fractures according to Fryckman classification was as follows: 5 (12.1%) Type-II fractures, 11 (26.8%) Type-IV fractures, 9 (21.9%) Type-VII fractures, and 16 (39%) Type-VIII fractures. Mean duration of external fixation application was 7.3 weeks (4-16 weeks). Mean follow-up time was 41.6 months (3-91 months). From the functional aspect, very good outcomes were obtained in 10 cases (24.3%), good outcomes in 14 cases (34.1%), medium level in 15 cases (36.5%), and bad outcomes in 2 cases (4.8%). In radiologic scoring, very good outcomes were reported in 3 cases (7.3%), good outcomes in 28 cases (68.3%), medium level in 8 cases (19.5%), and bad outcomes in 2 cases (4.8%). 22 (53.6%) complications were observed. Reflex sympathetic dystrophy were observed

in 15 cases (36.5%), pain in distal radioulnar joint in 8 cases (19.5%), pain in distal radioulnar joint, and eburnation in 4 cases (9.7%). In some cases, multiple complications were observed. There were also the cases, who were observed to have early stage sensation disorder and nail tip sensitiveness. But, the complaints ended when the fixator was removed.

Conclusion: Among the radiographic measurement parameters, radial shift and radial deviation, radial height and flexion and radial deviation, and radial deviation and ulnar deviation interacted with each other. Although there was a recovery in palmar tilt when compared to the preoperative graphs, the recovery was insufficient when compared to the healthy side. In ulnar deviation, there was no significant change in comparison to the preoperative graphs. During the follow-up, the only change determined was in the radial deviation. Following the functional score didn't alter the parameters. But, it was affected from joint range of motion and radial height. The complication affected the functional score and wrist extension.

In intra-articular distal radius fractures, the successful outcomes might be achieved by treating with external fixation without opening the fracture line.

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Hand and Upper Extremity Surgery

Poster Presentations

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PP-01

Simultaneous extensor digitorum brevis manus and wrist dorsal ganglion cyst

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Treatment with dorsal limited open incision and radial styloidectomy of scaphoid fracture that occurred in scaphoid hypoplasia lunotriquetral and scapotrpezoid coalition background

Mehmet Burtaç Eren, Murat Aşçı, Utkan Sobay, Orhan Balta

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Proximal pole scaphoid fracture leading to arthrodesis due to neglect

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Treatment of Kienböck's disease with Kuhlman's vascularized bone graft method

Burak Yaşar, Hasan Murat Ergani, Ahmet Kaplan, Ömercan Yağız Öksüz, Atakan Baş, Çağdaş Duru, Murat İğde, Ramazan Erkin Ünlü

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PP-05

Blunt foreign body injuries penetrated into palmar area

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Spontaneous extension pollicis longus tendon rupture after non-deplase distal radius fracture: A rare case report

Recep Abdullah Erten, Ali İhsan Tuğrul,
Mehmet Akif Çaçan

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Evaluation of mid-term results of bone mallet finger patients with all soft anchors

Adnan Kara, Barış Gülenç, Mehmet Erdil

İstanbul Medipol University

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Rehabilitation results of tendon and nerve injury patients

Bilge Düden, Zehra Duman Şahin, Arzu Abalay,
Figen Yılmaz, Beril Doğu, Gülgün Dur.....,
.....Alptekin, Rana Terlemez, Selda Çiftçi, Banu Kuran
Health Sciences University, Şişli Hamidiye Etfal Health Application Research Center, Physical Rehabilitation Clinic

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Traumatic fracture elbow dislocation in a child patient

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Bioabsorbable screw reaction: Ulnar neuropathy

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Long term partial prosthetic option for the treatment of large segmental fractures concerning half of the humerus

Alper Kurtoğlu, Erhan Şükür, Mustafa Uysal,
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Hand 5th finger sesamoid fracture: A rare case

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Case Report: Finger amputation as a result of human bite

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Case Report: Capitulum and hamatum fracture in the same hand in a pediatric patient

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A useful method to open web contracts after burn: Racket Hand Design

Oğuzhan Demirel, Bilgehan İlker, Perçin Karakol,
Can Uslu, Tevfik Balıkcı, Burak Ergün Tatar,
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Reverse dorsal metacarpal artery island flap: A case report

Ömercan Yağız Öksüz, Atakan Baş, Çağdaş Duru,
Ramazan Erkin Ünlü, Murat İğde, Burak Yaşar,
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Management of hand gunshot wounds

Ömercan Yağız Öksüz, Atakan Baş, Çağdaş Duru,
Ramazan Erkin Ünlü, Murat İğde, Burak Yaşar,
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Serious complication after human bite: death despite shoulder disarticulation

Ahmet Kaplan, Ömercan Yağız Öksüz, Atakan Baş,
Çağdaş Duru, Hasan Murat Ergani, Burak Yaşar,
Ramazan Erkin Ünlü, Murat İğde

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Regional solution of elbow defects requiring difficult reconstruction: Lateral Arm Perforator Flap

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Difficult surgery pulp replantation

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Muhammed Çağatay Engin², Ahmet Köse¹,
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Upper extremity schwannoma accompanied by epilepsy and low legs; Case report

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Megalodactylia

Alpagan Mustafa Yıldırım, Necmettin Karasu,
Salih Kavuncu, Arif Yılmaz

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Multiple hand xanthomas caused by hand movements

Necmettin Karasu, Salih Kavuncu, Fatma Deniz,
Arif Yılmaz

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A case of spontaneous pseudoaneurysm developed in the hand dorsal

Perçin Karakol, Bilgehan İlker, Can Uslu,
Oğuzhan Demirel, Tevfik Balıkçı, Burak Ergün Tatar,
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Metabolic syndrome affects and short term clinical outcome after carpal tunnel surgery release

George Mouzopoulos, Christos Vlachos,
Zoi Alexakou, Margarita Ampadiotaki,
Anastasia Tsembeli

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Suicide attempt: Median nerve grafting outcome

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A hook pin stuck in the forearm and injured radial artery: How to remove it

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A rare deformity in hand: Macro syndactyly

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Our delayed major replantation case and literature reminder

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Schwannoma in wrist

Yasin Canbaz

Gaziantep Dr. Ersin Arslan Education and Research Hospital Hand Surgery

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Our biloped flap applications with reverse pedicle in back of the hand defects

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Management of complex syndactyly and amniotic band syndrome union

Burak Yaşar, Hasan Murat Ergani, Ahmet Kaplan, Ömercan Yağız Öksüz, Atakan Baş, Çağdaş Duru, Murat İğde, Ramazan Erkin Ünlü

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Thumb finger reconstruction with toe transfer after transmetacarpal hand amputation

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Is extantive surgery necessary in Dupuytren's Disease?

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Giant mass on the hand: Malignant peripheral nerve sheath tumor with atypical placement

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A method that can be used in the management of hand infections: Continuous wash system

Şeyda Güray Evin, Gökçe Yıldırım, Mustafa Sütçü, Osman Akdağ

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Scar compression as a cause of reexploration in Carpal Tunnel Syndrome surgery

Şeyda Güray Evin, Cemil Işık, Mustafa Sütçü, Osman Akdağ

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Littler Flap Usage in Various Finger Defects

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Anterograd digital artery island flap's functional and aesthetic outcomes used in fingertip reconstructions

Hasan Murat Ergani, Ahmet Kaplan,
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An easy reconstruction option for finger and palmar defects: radial forearm flap's versatility

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Rare muscle tendon anomaly encountered during tendon repair in the wrist fifth extensor compartment: three tendon extensor digiti minimi muscle

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Radial tunnel syndrome

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Progressive brachial plexopathy due to subclavian artery pseudoaneurysm

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Nodular hydradenoma; A rare tumor of hand

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Hand osteoid osteoma; diagnosis, treatment and results

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A Rare settlement: Case report for osteoid osteoma at ulna head

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Case report: Nora lesion on hand

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Ramazan Erkin Ünlü, Murat İğde, Burak Yaşar,
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Abstract Supplement

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Hand Therapy

Oral Presentations

(OP 95 - OP 311)

OP-95

The influence of the wrist proprioception on the geriatric upper extremity functionality

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Purpose: Among older individuals, the sensations - especially proprioception - of the hand and wrist is critical for the functionality of the hand. The neurological degenerations affect the upper extremity functionality among the elderly individuals. The purpose of this study is to evaluate the hand and wrist proprioception of geriatric patients and correlate these findings with hand functionality.

Materials and Method: The study was conducted with a total of 60 geriatric people (30 male and 30 female) aged between 70 and 75. The hand and wrist proprioception were measured with the following devices: 3D Motion Sensor mOOver® (Joint Position Sense), Baseline Pneumatic Bulb Dynamometer® (grip sensitivity), Stabilizer Pressure Biofeedback® (pressure sensitivity), Two Point Discriminator (two-point discrimination) and a 128 Hz diapason (vibration sense). The functional capacity of the upper extremity was evaluated through the Jebsen-Taylor Hand Function Test (JTHFT).

Results: It was determined that the females had a higher error rate for the joint position sense (radial deviation of the dominant extremity; extension, radial deviation and ulnar deviation of the non-dominant extremity) ($p < 0.05$). The females also had significantly higher error rates for the gripping sensitivity ($p < 0.05$). However, the pressure sensitivity errors were significantly lower for both extremities of the females ($p < 0.05$). The two-point discrimination capabilities were not found

to be significantly different ($p > 0.05$). The vibration sensation was better for males, but only in the dominant extremity ($p < 0.05$). The male subjects were more successful in every subtest of the JTHFT, except the "pick up small objects" subtest ($p < 0.05$). There was a significant positive correlation between the hand and wrist proprioception measurements and the JTHFT results of the dominant extremity ($p < 0.05$).

Conclusion: Proprioception is an important part of the function of the hands and wrists, as they are the primary organs that are used for daily and vocational activities. Thus, in the geriatric rehabilitation and the hand rehabilitation centers, the geriatric patients should undergo therapies concerning the improvement of proprioception. These exercises will lead to improved upper extremity functions.

OP-124

Determining the level of competency of occupational therapy and physiotherapy students in their final year of bachelor's programme for hand therapy

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Purpose: Aim is to determine the level of competency of occupational therapy(OT) and physiotherapy(PT) students in their final year of bachelor's programme towards the hand therapy field.

Methods: Senior students at Hacettepe University OT and PT Department are included. Evaluation is done through 3 likert scale(noncompetent/slightly competent/competent) using a questionnaire that searches "Information Fields (IF)" and "Techniques-Instruments(TI)" which is based on handbook of contemporary hand therapy practice published by Hand Therapy Certification Commission(HTCC).

Results: 59 students participated in study. Students find themselves 14.4% competent in IF; 38.1% competent in TI. In IF, students find themselves the most competent(37.3%) in subtopic of "Surface Anatomy of the Upper Extremity". However, in IF, students state that they feel the least competent in subtopics of "Mechanical Properties of Materials and Parts used

in Orthosis and Prosthesis(52.5%)" and "Awareness on HTCC Policies and Instructions(61%)". In TI, students feel the most competent in "Providing Intervention Continuity(61%)" "Joint-Energy Protection Techniques(55.9%)" "Functional Activity(59.3%)". However, it is found that students feel the least competent in "Prosthesis Design,Choice and Usage(62.7%)" in TI.

Conclusion: Students feel more competent in basic assessment and therapeutic approaches used in hand therapy rather than in equipment,technology about hand therapy. These show that students, with theoretical and practical training throughout undergraduate education, feel competent manage treatment process however, they feel noncompetent about information and techniques belong to hand therapy. We think that it is necessary to support undergraduate education knowledge with the techniques such as after undergraduate certification programme,life long learning in hand therapy, which is needed to be developed rapidly in our country.

OP-146

The effect of sensory recovery on dexterity, activity and participation in patients with traumatic hand injury

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Aim: The aim of this retrospective cross-sectional study was to evaluate the effects of sensory loss and sensory recovery on hand dexterity and activity-participation levels in patients with traumatic hand injury.

Material-Method: Hospital charts of 131 patients, who were referred for rehabilitation after traumatic hand injury to Physical Therapy and Rehabilitation Clinic of Private Akgün Tem Hospital in Küçükçekmece, İstanbul from 2015 to 2017 were retrospectively reviewed. Sensory loss was evaluated by "Semmes Weinstein Monofilament Test". "Nine Hole Peg Test (NPHT)" and "Disability of Arm, Shoulder, Hand Questionnaire" (Quick DASH) was used to assess hand dexterity and activity-participation levels, respectively. NPHT and Quick DASH scores of the patients

with (n=52) and without (n=79) sensory loss were compared by using Mann-Whitney-U test. Among the 52 patients with sensory loss, 37 improved at the end of the rehabilitation treatment in terms of sensorial assessments. Kruskal-Wallis test was used to compare NHPT and Quick DASH scores of the patients with no sensorial loss (n=79), improved sensory loss (n=37), not improved sensory loss (n=15).

Results: The average age of the patients (21 females, 110 males) was 37.4 ± 12.3 years. Before treatment, there was no statistically significant difference between groups (with and without sensory loss) in terms of age, sex, injured hand, dominant hand, duration after orthopedic treatment, duration of treatment, number of treatment sessions, dexterity, activity and participation levels ($p > 0,05$). After the treatment, groups were compared in terms of change scores (after treatment score minus before treatment score) of NHPT and Quick-DASH. There was no significant difference between NHPT change score ($p = 0,063$) and Quick DASH change score ($p = 0,596$) among patients with and without sensory loss. There was no significant difference in NHPT change score ($p = 0,960$) and Quick DASH change score ($p = 0,175$) among patients without sensory loss, impaired sensory loss and not improved sensory loss.

Conclusions: In this study, the presence of sensory loss and sensory recovery did not affect hand dexterity and activity-participation levels of patients who were admitted to a hand rehabilitation program after traumatic hand injury.

OP-150

The quality evaluation of cultural adaption of patient reported outcome measures

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Objective: Purpose of study was to evaluate the Turkish adaptation processes and to investigate the quality of adapted version of Patient Reported Outcome Measures (PROM) related to hand and wrist.

Method: The databases were searched and the articles in which the Turkish adaptation of PROMs were found. Articles including children population and evaluating

only psychometric properties were excluded. Articles were evaluated by 3 checklist (Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures (Checklist 1), Quality criteria for measurement properties of health status questionnaires (Checklist 2), COSMIN checklist for Cross-cultural Validity (Checklist 3)). Articles were independently evaluated by two researchers.

Results: There were 8 PROMs with Turkish adaption. These were The Upper Extremity Functional Index (UEFI), Disabilities of Arm, Shoulder And Hand (-DASH), QuickDASH, Michigan Hand Outcomes Questionnaire (MHQ), The Upper Limb Functional Index (ULFI), The Patient Rated Tennis Elbow Evaluation, Patient Rated Wrist Evaluation, Boston Carpal Tunnel Syndrome Questionnaire. UEFI, DASH, MHQ had best scores for Checklist 1; UEFI, ULFI had best score for Checklist 2. The measurement properties of articles were "poor" quality according to COSMIN.

Conclusion: In study, it was found that none of the PROMs related to hand and wrist meet quality criteria. It was concluded that questionnaires couldn't meet quality criteria because of small number of persons included, lack of factor analysis, failure of expert committees to comply with defined criteria, and lack of responsiveness value. Considering the quality criteria, well-structured cultural adaptation process with sufficient number of participants in terms of the psychometric properties is important for providing more reliable results in clinical use of questionnaires.

OP-164

The efficacy of mirror therapy after carpal tunnel open surgery

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Objective: The aim of our study was to investigate the efficacy of mirror therapy after carpal tunnel open surgery on reducing pain, improving sensation, grip strength and function.

Material and method: 35 patients who appropriate the inclusion criteria were included in the randomized controlled trial. Patients were divided into two groups as a mirror group and a control group by simple drawing method. Mirror therapy was applied to the mirror group (n = 18) for a total of 10 sessions for 20 minutes during the 2-week immobilization period. The control group (n = 17) was allowed to rest with plaster during the postoperative immobilization period. When the immobilization process completed, both groups were applied to the physiotherapy program. All patients were assessed for pain (GAS), sensation (monofilament test), grip strength (dynamometer) and function (Boston Carpal Tunnel Questionnaire, 9-hole peg test) before and after surgery (at 6 weeks). SPSS 20.0 statistical program was used in the data analysis of the study and the level of significance was accepted as $p < 0.05$.

Result: At baseline, both groups were similar in terms of demographic characteristics and symptoms ($p > 0.05$). Comparison between groups after treatment; there was no statistically significant difference in pain levels, sensory test scores, 9-hole peg test collection and placement time and Boston Carpal Tunnel Questionnaire scores ($p > 0.05$).

Conclusion: Related parameters were improved in both groups with applied treatments. After carpal tunnel open surgery, adding mirror treatment to conventional methods had positive effects on the improvement of reducing pain, improving the sense of superficial touch, and improving function. But there was no statistically significant difference between the groups. It was revealed in the evaluations performed that the treatment's positive effects were sustained at 6 weeks after surgery in both groups.

OP-166

Why pediatric patients didn't get hand rehabilitation?

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Objective: Advanced contractures after hand burns in Eastern and Southeastern Anatolia are cases frequently encountered in hand surgery polyclinics. In our two-

center study, we investigated the reasons for not being able to receive hand rehabilitation for burn contractures after burn treatment.

Method: The study included 26 pediatric patients who referred to the hand surgery outpatient clinic of Şanlıurfa and Van Training and Research Hospital with burn contracture in the hand or finger, with impaired holding and grasping function, or impaired finger flexion-extension. The patients who were brought due to cosmetic reasons connected to skin scar and those that received burn treatment due to burns in other parts of the body were excluded from the study. The families of the patients were asked whether or not a hand rehabilitation was recommended by the treating physician, and if they had been recommended, whether they had referred to the relevant department and whether or not they had exercised at home.

Findings: The mean age of the patients was 6.3 ± 4.2 . The mean time of referral to the outpatient clinic was 2.3 ± 1.3 years after the burn. Among the patients, 22 (84.6%) were treated by plastic and reconstructive surgery, and 4 (15.3%) by the general surgery department. 23 (88.4%) patients' parents said that they were advised to apply to the physical therapy and rehabilitation outpatient clinic, 3 (11.5%) said they could not remember the recommendation. None of the 26 patients underwent functional exercise, pressure glove, etc. in the hospital or at home. The reasons for the 23 patients for not being able to receive hand physiotherapy despite the recommendations were as follows: 14 (60.8%) of the families said that they did not bring the patient because it was difficult to reach from the village to the hospital, 5 (21.7%) family said that they applied traditional herbal mixtures at home, 3 (13%) families said that they did not come on the physiotherapy appointment date, 1 (4.3%) said that they thought it would be worse if the hand was touched, 1 (4.3%) family said that they thought the hand would not heal.

Result: Physiotherapy initiated after hand burns is absolutely necessary to ensure joint range of motion and functional recovery. Orthoses performed by physiotherapists are very successful in preventing contractures, keeping hands in a safe position. As a factor in their lack of rehabilitation, it was another issue that attracted our attention that the treatment was irregular due to the fact that child patients were brought to treatment by the distant relative. We think that it will



Figure 1. 8-year-old patient who could not have any hand rehabilitation.

be beneficial to explain to the families, especially the first degree relatives of the pediatric patients that rehabilitation is the most important part of the treatment, depriving the patient of physiotherapy will decrease the gains of surgery and wound care and increase the probability of being disabled, and it will be useful to explain the types of contractures that might occur by supporting with visual materials.

OP-192

Investigation of movement imagery skills in musician

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Objective: Imagery is a cognitive process that can play an important role in the planning and execution of movements or actions. Although imagery occurs with sensory modalities (e.g., visual, auditory...), focus of movement imagery actually involves visual and kinesthetic images seen at the same moment. Our aim in this study is to evaluate the movement imagery skills of the conservatory students.

Methods: Twenty two musicians and 24 non-musicians (control group) were included in the study. After the demographic information of the individuals was taken, the Turkish version of the Movement Imagery Questionnaire-3 (MIQ-3) was applied. All statistical analyzes were performed using SPSS © 20 software. In terms of movement imagery, the difference between the two groups was assessed by the Student's t-test.

Results: The mean age of musicians (3 female, 19 male) was $23,68 \pm 4,71$ years while the control group (10 female, 14 male) was $22,95 \pm 3,5$ years. The mean

music education of musicians was $8,13 \pm 3,60$ years, while the mean age of starting to play was $13,63 \pm 2,30$ years. The mean kinesthetic imagery was $6,31 \pm 0,80$ in the musicians, $5,35 \pm 1,22$ in the control group; the mean internal visual imagery was $6,40 \pm 0,78$ in the musicians, $5,58 \pm 1,26$ in the control group and the mean external visual imagery was $6,48 \pm 0,67$ in the musicians, $5,70 \pm 1,03$ in the control group. There was a significant difference between the two groups in terms of three parameters ($p < 0.05$).

Conclusion: Mental imagery in the mind of a musical piece is widely used by professional musicians to rehearse the difficult parts of a musical passage. Our research findings show that musicians have more movement imagery skills than other individuals. There are studies in the literature which show that kinesthetic imagery is an effective complement to actively playing an instrument. For this reason, it is considered that training directed movement imagery in conservatories will increase musicians' play performance.

OP-202

Design and production of ring orthotics with 3D Printer

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Aim: Swan neck and buttonhole deformities reduce the active use of the hand, especially by influencing the grip pattern. Although ring orthoses are the most commonly used conservative treatment modalities for correction of these deformities, they are not widely used because they are difficult to manufacture and cosmetically unsatisfied patients. Aim is to design ring prototypes orthoses with 3D printing technologies.

Method: Finger was scanned with 3D with the Aicon Smart Scan scanner from Hexagon, which has 2 CCD cameras and 1 laser system. Point cloud of near 400 points was obtained. The resulting point cloud was converted to solid model via software. The solid model was modeled with CAD software and 3D prototype

was fabricated by printing with 3D printer. The suitability of the prototype was evaluated by the designer and hand therapist. ABS material was preferred as raw material in manufacturing.

Results: 3D printing technologies have gained a great advantage over traditional methods in terms of time and cost. Scanning of the finger, design of the ring orthosis, and manufacturing processes with 3D printer were completed in approximately 1.5 hours. As a result of the calculations, it was observed that the production was 10 times more cheaper than the existing methods. It was concluded that the splint is anatomically compatible, does not cause pain and discomfort, and provides correct positioning of the DIP and PIP joints during functional use, whereas the durability of the splint is insufficient due to the structure of the hammer.

Discussion: Splint with an aesthetic appearance, anatomically matched, briefly completed and low cost ring splint was obtained. In order to increase the strength of the splint, manufacturing is planned with more flexible but also more durable raw material. 3D printing technology, splint design and manufacturing are thought to provide great advantages in terms of aesthetics, time and cost in obtaining a patient-specific product.

OP-203

The relationship between smart phone addiction and musculoskeletal system problems in young adults

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Objective: The aim of this study is to examine the relationship between smartphone addiction and upper extremity musculoskeletal system problems in young adults.

Materials-Methods: This study was conducted on 84 individuals with a mean age of 20.25 ± 3.2 years. After receiving informed consent from participants, the individuals responded the smartphone addiction scale-short form. Then an online form which contains questions about the smartphone usage habits and pain

in the upper extremity were filled. The cervical region, shoulder and wrist pain at rest, activity and post-activity were assessed by Visual Analogue Scale (VAS).

Results: It was determined that most of the people use their smartphones; more than 4 hours a day (46,3%), most frequently in sitting position (64,3%) and for browsing the internet (53,6%). It was determined that pain in the cervical and shoulder regions were positively correlated with the smartphone addiction scale-short form total score. There were significant positive correlations between the smartphone addiction scale total score and the resting ($p < ,01$ $r = ,362$), activity ($p < ,01$ $r = ,293$) and after the activity ($p < ,01$ $r = ,465$) VAS scores of cervical region. There were significant positive correlations between the smartphone addiction scale total score and the resting ($p = ,012$ $r = ,274$), activity ($p = ,023$ $r = ,248$) and after the activity ($p = ,012$ $r = ,274$) VAS scores of shoulder region. There was no significant relationship between VAS scores of wrist and smartphone addiction scale-short form total score ($p > ,05$).

Conclusion: Because of the relationship between the smartphone addiction and pain in the cervical and shoulder regions, it is suggested that individuals with smartphone addiction have to be informed about musculoskeletal problems and that physiotherapists should be included in the instruction programs.

OP-217

The relation of electrical muscle activity to functional status after flexor tendon repair in zone II-III

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Objective: In this study, it was aimed to investigate the relation of electrical muscle activity to functional status in patients who had surgery due to zone II-III flexor tendon injury and were taken to the early hand rehabilitation program.

Materials and Methods: Eight patients were included in the study who were aged between 18-56

(32.75±13.97) years and operated for the injury of at least one of the flexor digitorum superficialis (FDS) or flexor digitorum profundus (FDP) tendons in zone II-III. Tendon repairs were performed as core suture with 3/0 and 4/0 polydioxanone (PDS) and epitendinous running suture with 6/0 PDS. All cases were included in the early passive mobilization program according to the modified Duran protocol, and the cases started using the dorsal blocking splint on postoperative 3rd to 5th days. The exercise program was applied by the same physiotherapist 3 times a week, for 12 weeks. Splint use was terminated at 6 weeks postoperatively. Electrical muscle activity (by EMG Biofeedback device), range of motion (ROM, by Total Active Motion (TAM) protocol), activity and participation levels (by Michigan Hand Outcomes Questionnaire) were assessed at post-operative 5th and 12th weeks; grip and pinch strength at 12th weeks. The fine hand dexterity was assessed with the Purdue Pegboard Test, and the hand function with the Jebsen Taylor Hand Function Test (JTHFT) at 12th week.

Results: There were FDS and FDP tendon injuries in 11 fingers of 8 patients. Four of the cases were male and 4 were female (50.0% each). Two cases (25.0%) had injury in 2nd, 4 cases (50.0%) in 3rd, 1 case in both 2nd and 3rd (12.5%) and, 1 case in 2nd, 3rd and 4th fingers (12.5%). There was a significant relationship between FDS electrical muscle activity and TAM score at 5th week and, JTHFT card turning activity and FDP electrical muscle activity at 5th week ($p=0.037$, $r=0.738$; $p=0.023$, $r=0.778$, respectively). There was no significant relationship between FDS and FDP electrical muscle activity and functional outcomes at 12th week.

Conclusion: It is important to know the quality and quantity of muscle contraction in zone II-III flexor tendon injuries where significant functional problems are seen, in order to understand the role of muscle activity in functional impairment.

OP-219

Conservative follow-up results of ulnar styloid fractures associated with distal radius fracture

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Objective: The aim of this study was to investigate the clinical and functional results and its relation with fracture type and healing of conservatively treated ulnar styloid fractures concomitant with distal radius fractures.

Materials and Methods: A total of 22 patients, 9 female and 13 male, with ulnar styloid fractures accompanying distal radius fracture in the Orthopedics and Traumatology Clinic of Pamukkale University between 2015-2017 were prospectively followed. 2 patients with implant failure, two with ulnar fixation, one with DISI and five with radius malunion were excluded. A volar plate system was applied to all radius fractures. Patients were included in the 12-week hand rehabilitation program from the first day of the post operation. Early active motion, edema and pain management, scar care, progressive resistance training is provided. In the last follow-up at 6th months, pain with visual analogue scale (VAS), joint range of motion (ROM), activities of daily living with Quick-Disabilities of Arm Shoulder and Hand (Q-DASH), gross grip and finger strength evaluations, activity participation with Jebsen Taylor Hand Function Test (JTHFT) and Purdue Pegboard Test (PPT) were performed. According to the AO fracture classification, patients were grouped firstly as 2U3A1.1 (tip fracture) and 2U3A1.2 (base fracture) and secondly with and without ulnar styloid healing, then statistical analysis was performed.

Results: Six of the patients included in the study were female and 6 were male and the mean age was 45,50 ± 15,64 years. Return to work time was 63±26,5 days. According to the AO classification, 6 patients had tip (50%) and 6 patients had base fracture (50%). There were no union in 7 patients (58.3%) and union in 5 patients (41.6%) in ulnar styloids. There was no statistically significant difference in VAS, ROM, Q-DASH, gross grip and pinch strength, JTHFT and PPT between the groups according to AO classification and ulnar styloid healing state (Mann Whitney U Test, $p>0,05$).

Conclusion: In this study, the presence of ulna styloid fracture did not show any significant difference in clinical, functional status and activity participation results according to the literature according to fracture nature and union status.

OP-241

Assessment of hand rehabilitation awareness of physiotherapy and rehabilitation students

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Purpose: In our study, we aimed to evaluate the awareness of 3rd grade students who had theoretical courses related to hand rehabilitation and 4th grade students who had an internship in hand rehabilitation unit as well as the theoretical course of hand rehabilitation.

Materials and Methods: A total of 59 Physiotherapy and Rehabilitation Department students (24 in 4th grade, 35 in 3rd grade) included in the study. Participants have responded to survey questions that we have prepared. Question 1 (Q1): What is the department you think you will work after graduation? Question 2 (Q2): What are the factors that affect you in choosing this department? Question 3 (Q3) Do you think that the number of hand rehabilitation units in our country is sufficient? Question 4 (Q4) Do you have any information about the therapeutic modalities used in hand rehabilitation?

Results: According to the results of the questionnaire, 33.33% of the 4th grade and 11.44% of the 3rd grade in Q1 selected hand rehabilitation as the first field preference. In Q2, 75% of the 4th grade students who selected hand rehabilitation gave the experiential answer that was given to the internship, while 25% answered the consultant factor. In 3rd grade students 25% think that can easily find a job, 25% think that talent and knowledge accumulation is more likely, and 50% say it is a consulting teacher factor. In Q3, the 4th grade students say 75% no, the 3rd grade students say 50% no. 4th grade and 3rd grade students in Q4 have a 75% yes.

Discussion: When we look at the results of our study, it is seen that 4th graders choose the hand rehabilitation area as a future study area higher than the 3rd grade. It is observed that the students who are practicing on this field have increased awareness of hand rehabilitation with their interest. It is also a sign that most of the students are questioning the factors that affect the field preferences, and the vast majority of them point out the experience of their experiences at the internships. The

answer to the question of whether you have knowledge about therapeutic modalities is that equality is what this knowledge is about teaching the curriculum in previous educational years.

OP-242

Comparison of the validity and reliability of the three different methods used to measure wrist joint proprioception

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Introduction: Proprioception is a sensation created by muscle, tendon, joint capsule and skin stimuli. There are many different tools and methods used in the literature to evaluate the joint proprioception. However, the number of studies on the reliability of these methods is rather limited.

Objective: The purpose of our study; to compare the validity and reliability of Goniometer, Inclinator and JPSG (Joint Position Sense Goniometer) methods used in proprioception measurement.

Method: A total of 13 volunteer healthy participants (Age; 22,69 ± 3,47) were included in the study. Measurements were performed in a sitting position with an isokinetic dynamometer [Cybex NORM®, Humac, CA, USA] used to test the validity of these three methods. During the evaluation with the isokinetic dynamometer, the participants' elbow was in 90° flexion, the wrist was in full supine position and the forearm was stabilised by using a band. When the participants were assessed with a goniometer and an inclinometer, they were placed in the sitting position with the elbow on the desk, the forearm in flexion, the wrist in the neutral position and the fingers in the resting position evaluations were made at this position. JPSG consists of two wooden boards fixed in a 90° angle to each other. There were angle signs with sensitivity of 1° at the board which parallel to the ground. In evaluation with JPSG, the patient was positioned in the sitting position, the elbow in flexion, the wrist was on the board which parallel the ground. Statistical analysis was performed using SPSS 22 software. The spearman test and the Intraclass Correlation Coefficient (ICC) method were used for statistical analysis.

Results: As a result of the analyzes, Goniometer (C-C [Correlation Coefficient]; 0,645, 0,589, $p < 0,01$, 0,034, respectively) and JPSG (CC; 0,585, 0,580, $p < 0,036$, 0,038, respectively) were found to be moderately valid on both dominant and non-dominant sides, and inclinometer (CC; 0,267, 0,239, $p < 0,378$, 0,231) was found to be not valid. According to the ICC test results; the inclinometer (ICC: 0,196, 0,072, respectively) is not reliable on both dominant and non-dominant sides, the goniometer (ICC: 0,403, 0,431, respectively) is moderate and JPSG (ICC; 0,790, 0,671, respectively) is well reliable on both sides.

Discussion: According to our study, Goniometer and JPSG can be used for wrist proprioception measurement, but the inclinometer does not have sufficient validity and reliability for this evaluation. However, this is a pilot study and the number of participants should be increased to reach more accurate information about this result.

OP-275

Effect of wrist problems on work and living quality in dentists

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Purpose: The aim of this study is to evaluate the effect of wrist problems caused by working conditions on the work and life quality in dentists

Material-methods: 50 dentists (M/F: 18/32) from different hospitals were included to this study between October 2015 and May 2016. The demographic data of the cases were recorded. Inclusion criteria were having one of three diagnoses; carpal tunnel syndrome (CTS), ganglion cyst (GC) or De Quervain's syndrome (DeQ). Exclusion criteria were having any neurological or orthopedic diagnoses, undergoing any operation related to musculo-skeletal problems, working less than 2 years in dentistry. Pain was evaluated by Visual Analog Scale (VAS), physical disability and symptoms effect on work-ability was measured by DASH-job model and quality of life was measured by SF-36. Wrist flexor and extensor muscles strengths were measured by manual muscle test.

Results: Distribution of participants were 52% CTS ($n=26$), 30% GC ($n=15$) and 18% DeQ ($n=9$). Mean ages of groups were 48.65 ± 12.3 years for CTS, 49.66 ± 10.71 years for GC and 49.0 ± 6.38 years for DeQ. The highest VAS score was in DeQ group with mean of 4.88 ± 1.36 , and all participants mean VAS score was 4.02 ± 1.95 . All subscales of SF-36, except from physical role, emotional role and pain were close to normal. Measured physical functioning, functioning-role physical-role, energy, mental-health, social functioning, pain and general health scores were; 82 ± 14 , 22 ± 18 , 40 ± 16 , 61 ± 13 , 79 ± 14 , 77 ± 18 , 64 ± 15 and 58 ± 14 respectively. There was a significant difference between CTS and GC groups in SF-36-Emotional-Role sub-parameter ($p < 0,05$). There was a significant difference between CTS and groups in SF-36-social-health sub-parameter ($p < 0,05$). The DAS-Job scores were 26.00 ± 25.32 , which was lower than the normal values stated in the literature and there was no significant difference between the groups ($p > 0,05$). The mean wrist flexor and extensor manual muscle-force scores were 4.08 ± 0.75 and 4.06 ± 0.73 , respectively. There was no significant difference between the groups ($p > 0,05$).

Conclusions: As a result of this study, It is shown that working constantly in static postures without having a break, using repetitive motions and having non-ergonomic working environments have caused to develop wrist problems which reduced working and social living quality in dentists.

OP-299

Effectiveness of functional physiotherapy approach in OBBP with glenohumeral deformity: Preliminary study

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Introduction: Obstetric brachial plexus palsy (OBPP) is a complex peripheral nerve injury leads poor function due to motor and sensory disturbances as well as changes in the muscle tissue and joint structures. One of the most important joint problems is posterior subluxation of humeral head.

Purpose: The purpose of this study was to investigate the α angle changing in shoulder and the relationship between motor performance and α angle changing after physical therapy treatment.

Method: Six children with upper trunk injury aged between 3-7 months were enrolled to study. Congruency of shoulder joint (α angle) analyzed with using Ultrasound Imaging. Shoulder motor performance was assessed with using Gilbert's Scale. Shoulder external rotation motion was assessed with using Active Movement Scale (AMS). Physiotherapy program was consisted of functional neurodevelopmental activities, muscle stretching, joint mobilization and airplane orthosis and lasted 10 weeks.

Results: Alpha (α) angle was decreased in all children after treatment ($p=0.028$) while Gilbert ($p=0.020$) and AMS ($p=0.026$) scores increased. Decrement in α angle did not affect Gilbert ($p=0.686$) and AMS ($p=0.055$) improvement.

Discussion: Physiotherapy seems effective to regain shoulder biomechanics as well as shoulder function in limited cases. Regular physiotherapy in OBPP should be maintained to prevent shoulder subluxation. It's a strong alternative to surgery for preserving the shoulder congruency.

OP-311

Effect of glenohumeral joint mobilization on shoulder internal rotation in children with brachial plexus birth palsy

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Introduction: Brachial plexus birth palsy is a complex peripheral nerve injury occurs during delivery. It leads many functional limitations including external rotation, forearm supination. Usually too much effort is exerted to obtain shoulder external rotation. Meanwhile internal rotation function is ignored.

Purpose: The purpose of this study was to investigate the effect of glenohumeral joint soft tissue mobilization on shoulder internal rotation. We also investigated the shoulder external rotation function after mobilizations.

Method: Fourteen children with Narakas Type 2 BP, aged between 16-36 months were included to the study. Active Movement Scale score was used to assess shoulder function. Glenohumeral joint mobilizations were taught to the mothers of children. They applied the program for 12 weeks. Stretching of glenohumeral joint capsule in the direction of internal rotation, traction of the glenohumeral joint in 90° abduction for 30 seconds were given in addition to the regular home exercise program.

Results: Both shoulder internal and external rotation functions were improved after glenohumeral joint mobilizations ($p=0.001$ and $p=0.008$, respectively).

Discussion: Manual therapy of the shoulder glenohumeral joint is an effective way to support regular home exercise programs. It should be implemented to the regular physiotherapy program earlier to acquire both agonist and antagonist function in shoulder rotation.

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Hand Therapy

Poster Presentations

(PP 96 - PP 308)

PP-96

The application of the upper extremity neuroprosthetics among hemiplegic patients: A systematic review

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Purpose: Neuroprosthetics are used to restore motor and sensory functions following spinal cord injuries, hemiplegia and other upper motor neuron disorders. These prosthetics make use of neuromuscular electrical stimulation (NMES) and functional electrical stimulation (FES). They contract the muscles in the hemiplegic upper extremity and help the patients become independent in their daily lives. This systematic review aims to determine the neuroprosthetic devices that are used to fix the upper extremity problems faced by the hemiplegic patients and to investigate the efficacies of the used upper extremity neuroprosthetics.

Materials and Method: The review consists of articles that were published between January, 2000 and November, 2017. The articles were accessed through PubMed database on EndNote X7. The article search consisted of the words "neuroprosthetics", "hemiplegia", "stroke", "rehabilitation", "functional electrical stimulation", "neuromuscular electrical stimulation"; and the combinations of the keywords: "hemiplegia and neuroprosthetics", "hemiplegia rehabilitation", "functional recovery", "upper extremity rehabilitation". The review did not exclude any studies based on the design or the sample size of the studies, every accessed article that was published in English or Turkish was included in the study.

Results: The number of accessed articles was 487. A total of 11 articles were excluded that were duplicates or where the full text was not accessible. It was determined that the application of the neuroprosthetics improve upper extremity functions. Furthermore, the hand functions of the patients that underwent "mirror

therapy and FES" and those that underwent "conventional therapy and mirror therapy" were compared. It was found that the hand functions of the neuroprosthetic group significantly increased.

Conclusion: The review of the literature indicates that there aren't enough studies regarding the application of neuroprosthetics for the treatment of the upper extremity hemiplegia. The clinically applicable hand neuroprosthesis system is able to provide many functional benefits, but it is still not widely used. The neuroprostheses may be beneficial for the reacquisition of the hemiplegic hand and upper extremity functions. Similarly, there are only a few studies that investigate the application of neuroprosthetics for shoulder subluxation and pain syndrome. It is recommended that further studies should investigate the applicability of the neuroprostheses for shoulder subluxation and the shoulder-hand syndrome (the most common problems faced by the upper extremity hemiplegic).

PP-118

Clinical characteristics of patients with tendon injury

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Background: The aim of this study was to examine the demographic, etiological and clinical characteristics of patients with tendon injuries.

Material and methods: Data was retrospectively reviewed from files of 86 hand injured patients who applied to the Physical Therapy and Rehabilitation Polyclinic of Trakya University Medical Faculty Hospital between 2014 and 2017. The data of 72 patients with tendon injuries were included in the study. The demographic characteristics of the patients and information related to the injuries were reviewed.

Results: Flexor tendon repair was performed in 69.4% of the patients and extensor tendon repair was performed in 51.4% of the patients with tendon injuries. Most injuries (36.1%) occurred at flexor zone 5 level. The most frequently injured tendons were FDP dig. II (29,2%), FDS dig. III (27,8%) and FDP dig.

IV (27,8%). 44.4% of the patients had nerve injuries accompanied. 84.7% of the cases were male patients. 86.1% of the injuries were caused by work accidents and 47.2% were by machine.

Conclusions: According to the results of retrospective evaluation of patient files it is observed that most of the patients with tendon injury were male patients in working class and injuries mostly occur in form of work accidents. It is thought to increase consciousness of work safety; via taking precautions and training employer-employee are necessary.

PP-133

Examination of the factors affecting the use of orthosis from the perspective of individuals using upper extremity orthosis

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Purpose: Using of orthosis is an important part of the intervention in individuals with orthopedic problems. In the literature, it is said that individuals are affected negatively by the factors originating from material such as splint appearance, and weight. In this study, we aimed to examine the factors that can affect both the individual and the material that may affect the use of individuals in splints, and in particular, from the perspective of the individual, how these factors have an impact on individuals.

Materials and Methods : Our study was carried out using qualitative interview method for individuals who applied splint to Hacettepe University Occupational Therapy Department because of orthopedic hand injury. Demographic information was recorded. A total of 10 adults were included in the study, with a mean age of 35.5 +- 13.27 and 3 female and 7 male, respectively. Semi-structured qualitative interviews with individuals who were splinting an average of 22.4 hours a day were performed with the diagnosis of the tendon injuries. Outputs of the interviews were analyzed by coding, short note writing and theoretical sampling methods.

Conclusion: It was determined that the most important factor influencing the use of splints by individuals was the priorities of the individual. In the age range of 18-25, when the individuals giving priority to be affect-

ed emotionally by the appearance of splint. The priority of the Individuals in the age range of 26-65 is to heal as soon as possible, and they are physically adversely affected by the discomfort given by the night use. The most important result of the study is that all the individuals involved in the study are adversely affected by daily life activities, leisure activities and producing activities.

Discussion : Considering these factors affecting the use and duration of orthosis, considering the priorities and wishes of the individual, it is concluded that the negative effects of splint use will be reduced and intervention will be activated by making the splint more ergonomic and more cosmetically appealing.

PP-165

Effect of limbic bar splint applied after combined median and ulnar nerve injuries on joint range of motion

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Objective: This study at investigating the effect of the lumbar bar splint on claw hand and finger joint range of motion.

Methods: 16 patients (3 female, 13 male) who were admitted to our clinic with zone 5 injury between 2015 and 2018 were included in the study. Patients with bone fractures and FCU, FCR and PL results were excluded from the study. Patients were randomly assigned into 2 groups. Operation of all patients was performed by the same surgeon. Flexor tendons are repaired multi-strand core suture techniques. Group fasciculation's were performed under the microscope with 8/0 prolane for the reparation of nerve. Dorsal gypsum was removed on post-op 12. day which was applied during operation. Both groups received kleinert splint and rehabilitation started again on 12. day. All patients underwent 10 re-active passive flexion movements per hour with kleinert splint. Fingers were fixed at night from dorsal side. On the 21st day, active flexion movements started. On the 28th day, active extensor exercises and tendon-shifting exercises without dorsal block were

performed in the presence of physiotherapist. Kleinert splint was removed at Week 6. In the group 1, kleinert was applied until the end of the 10th week of the atrium with the fixation on the thumb opacity after the atrophy. Patients were followed for 3 days a week for 10 weeks. At the end of the study Buck Gramko scorer was performed to the patients.

Findings: The mean age of group 1 was 36.125 (17-58) and mean age of group 2 was 34.125 (19-60). 31.25% (5 patients) of patients had dominant hand injury. Post-operative measurements were made at week 10 by the same investigator. In group 1 Buck gramko score were found very good in 81.25%, good in 15.625% good, worse in 3.125%. In group 2 Buck gramko score were found 50% very good, 18.75% good and 31.25% bad. There was no statistically significant difference between the groups in the 2nd and 3rd digits. The improvement of the fourth and fifth fingers were statistically significant in favor of the group 1 using the lumbar splint.

Conclusion; We believe that Buck gramko score has improved and joint range of motion increased by the use of posterior kleinert splint in median and ulnar nerve combined injury.

PP-174

Relationship between upper extremity functional level, self-esteem and individualistic sense of coherence in adult hemiplegic cerebral palsy

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Purpose: In our study, it was aimed to evaluate the relationship between upper extremity function, self-esteem and sense of coherence in adult hemiplegic cerebral palsy individuals.

Methods: The study included 16 volunteer individuals with hemiplegic cerebral palsy (mean age:28.87±4.83 years). Bimanual Fine Motor Function (BFMF), Jebesen Hand Function Test (JHFT), Motor Activity Log-28 (MAL-28) Quality of Movement (QOM) scale and Amount of Use (AOU) scale were used for assess

upper extremity functions; self-esteem evaluation was performed with Coopersmith Self-Esteem Inventory (CSEI) and Sense of Coherence Scale (SCS) was used for individualistic sense of coherence assessment.

Results: There was a significant, positive and moderate correlation between the scores of CSEI and MAL-28-AOU ($p:0,03$; $r:0,543$); and correlation between the CSEI and MAL-28-QOM scale scores was significant, positive and moderate ($p:0,032$; $r:0,537$). There was no statistically significant correlation between CSEI and JHFT ($p>0,05$). There was no statistically significant correlation between SCS and MAL-28 ($p>0,05$) when there was significant, negative and moderate correlation between SCS and JHFT-picking up small objects (right hand) ($p:0,047$; $r:-0,503$).

Conclusion: It was determined that self-esteem scores increased as movement quality and amount of use increased in our study. The lack of a significant association with JEFT was attributed to the low level of motor skills of the participants according to BFMF. It has been determined that focusing on the development of the upper limb function in the long term and at every stage is an important strategy that the clinicians as well as the hemiplegic individual will notice.

PP-179

Examination of hand gripping strength in different upper extremity positions in healthy young individuals

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Objective: The purpose of this study was to examine the grip strength at different shoulder positions in healthy subjects and to compare the hand grip strength between the dominant and non-dominant limbs.

Material and Method: 40 healthy university students (F :20/ M:20) between the ages of 18-25 were included in the study. The demographic data of the cases were recorded. Exclusion criteriae included deformities or postural disturbances, pain, limitation of movement that could the affect upper extremity function. Hand grip strength was assessed using the "Jamar Plus + Hand

Dynamometer" digital hydraulic hand dynamometer. Measurements were taken at standard test position and at 0°, 45°, 90°, 135° and 180° shoulder flexion and abduction angles on each dominant and non-dominant sides.

Results: The mean age of women was 22.20 ± 0.95 years, while that of men was 22.4 ± 1.66 years. There was no significant difference between anthropometric measurements of dominant and non-dominant limb length of the subjects ($p > 0,05$). There was no significant difference between the standard test position in the dominant and non-dominant extremities and the muscle forces in 45°, 90° and 135° shoulder flexion ($p > 0,05$). On the dominant and non-dominant side, however, there was a significant difference between the grip strength at 180° shoulder flexion and the grip strength at other angles ($p < 0.05$). There was a significant difference between the non-dominant side grip strength at 45°, 90° and 180° shoulder abduction and the other grip strength values ($p < 0,05$). In all cases, grip strength was found to be about 10% higher in the dominant hand than in the non-dominant hand. There was a significant difference between the values of grip strength on dominant and non-dominant sides with the same flexion and abduction angles ($p < 0.05$).

Conclusion: As a result of the study, it is thought that shoulder flexion and abduction by 180° increase the maximum grip strength due to increased shoulder stabilization provided by the back muscles. We believe that future studies with larger data and with electromyographic techniques for evaluating hand grip strength and muscle activity of the back muscles in different shoulder positions are warranted for further investigation.

PP-201

Investigation of the functional status in dupuytren contracture surgery after early hand rehabilitation program

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Objective: The aim of this study was to investigate the effects of the early hand rehabilitation program after Dupuytren contracture surgery on range of motion and grip strength.

Materials and Methods: Thirty-four patients aged from 40 to 70 (mean age 61.76 ± 9.21 years) years who were operated due to Dupuytren's Contracture Tubiana stage III and IV between 2014 and 2017 were included in this study. All cases were followed-up once a week for wound care, edema control, pain control, splinting and active joint motion exercises for all joints from the first postoperative week for 8 weeks. A static dorsal hand-finger splint was used the affected finger or fingers for early positioning. After the sutures were removed, the splint was changed to volar side of the hand and directed for 3 months use only nights. At 8th week mild resistance exercises were started. The hand therapy program continued for 18 weeks. The descriptive information of the cases were recorded. ROM (by distance measurements) at 8th and 18th weeks after injury, and the grip strengths at 12th and 18th weeks were evaluated. The results were analyzed by Paired Samples t test.

Results: Six cases were female (17.6%) and 28 cases were male (82.4%). All cases had right hand dominance. 16 cases (47.1%) had contracture on dominant and 18 (52.9%) had on nondominant side. Surgical procedures were longitudinal incision and Z plasty for 32 cases (%94.1), grafting for 1 case (%2.94) and tenolysis for one case (%2.94) used. At 12th week the mean Q-DASH score was 22.20 ± 16.81 . At 18th week, flexion of the 2nd, 3rd and 4th fingers were significantly higher when compared to the 12th week results ($p < 0.05$). However, there was no significant difference in hand and pinch grip strength at 12th and 18th weeks ($p > 0.05$).

Conclusion: As a result of this study, we think that early hand rehabilitation program after Dupuytren Contracture surgery is important to achieve lost joint range of motion and regain upper extremity functional status.

PP-218

Long term results in zone I-II extensor tendon injuries

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Objective: The aim of this study was to evaluate the results related to long term functional status and activity participation in patients with extensor tendon injuries in zone I-II who treated surgically and recieved hand rehabilitation program.

Materials and Methods: In the study, a total of 9 patients (11 fingers) aged between 16-65 years were prospectively followed up in Hand Rehabilitation Unit between 2015 and 2017. 2 fingers were isolated, 8 fingers were accompanied by fracture, 1 finger was accompanied by digital nerve and artery involvement. Tendon repairs were performed with 4/0 and 5/0 prolen, arterial repairs with 10/0 ethilon and nerve repairs with 8/0 ethilon. K-wire is applied in the presence of fracture. After the operation, immobilization was applied for 8 weeks with static volar finger splint. Later, controlled active motion was initiated with individual progression, edema and pain management, scar care have been made. At the 18th week, DIP joint range of motion, grip and pinch strength were evaluated, Michigan Hand Outcome Questionnaire (MHOQ) and 9th Hole Peg Test were applied at 24th week.

Results: Two of the patients were female (22.2%) and 7 were male (77.7%). The average age is 36.90 ± 14.93 years. The dominant extremity was right in 8 patients (88.8%) and left in 1 patient (11.1%). The second, then third, fourth, and fifth fingers were affected, respectively. Ten of the affected fingers (90.9%) were open and 1 (9.1%) were closed traumas. The DIP joint range of motion was excellent (18.2%), good (27.3%) and moderate (54.5%) according to Crawford classification. Mean extension loss was $15.00 \pm 10.24^\circ$. Compared with the unaffected extremity, there was a significant difference in gross grip, pulp and lateral strength measurements (Wilcoxon test, $p < 0.05$). While, there was a significant difference in MHOQ ADL subscale when compared to the unaffected extremity (Wilcoxon test, $p < 0.05$), there was no statistically significant difference in total subscore (Wilcoxon test, $p > 0.05$). Also, there was no significant difference in the 9-Hole Peg Test, which showed long-term, time-based activity performance of the affected hand (Wilcoxon test, $p > 0.05$).

Conclusion: Surgically treated patients with extensor tendon injuries in zone I and II had satisfactory results in accordance with the literature in terms of long-term range of motion and extensor deficit. Also, compared to the unaffected extremity, approximately 60% recov-

ery of grip and pinch strength, and approximately 85% recovery in functional results were provided. We think that, grip force, functional level and returning to the activity should be taken into consideration in long-term follow-up.

PP-224

Results of rehabilitation after pollicization surgery: A case report

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Objective: Purpose is to investigate effectiveness of rehabilitation program after pollicization surgery in congenital mirror hand deformity.

Methods: A 5 year old male patient who was referred to rehabilitation after surgery was evaluated for hand function and activities of daily living (ADL) after 4 weeks immobilization period and the functional change and independence level after rehabilitation were analyzed. Grasp,nine-hole peg test(NHPT) was used to assess hand functions;WeeFIM was used to assess ADL. Evaluations were repeated in first and last sessions. The rehabilitation program was planned 45 minutes for 2 days in a week,continued for 12 weeks.

Results: The right hand of case is effected and he use his left hand more actively in daily living. In initial evaluation, finger position, contact area and force of all types of grasping were found to be weak. NHPT placement right/left 43/15 seconds; the extraction was found to be right/left 19/10 seconds. WeeFIM score was 118 because of independence bathing and dressing- upper activities. In second evaluation,the force was perfect; contact area, finger position in the middle gripping type showed improvement but not excellent. Placement in NHPT was right 35, left 15; the extraction was right 11,left 11. WeeFIM score was 121.

Conclusion: The case shows that early rehabilitation program after pollicization surgery has a critical point in terms of independence in ADL and adaptation of the affected hand to daily life.We think that long-term rehabilitation shouldn't limited clinically, it should be implant life of child and child's family due to have the same functional level for the child's peers.

PP-225

Comparison of cold intolerance in individuals with peripheral nerve injury

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Objective: Cold intolerance is an abnormal or exaggerated reaction that causes the injured part to avoid cold or become uncomfortable when exposed to cold. The size of the dermatome area of the median and ulnar nerves and the functional losses of these nerves after injury are different. The aim of our study is to compare the severity of cold intolerance after ulnar or median nerve injury.

Materials and Methods: Thirty-five individuals (21 female, 14 male) aged 18-65 years with median or ulnar nerve injury were included in the study. Cold intolerance was assessed by the Cold Intolerance Symptom Severity Scale (CISS-T). According to this scale, as the score increases, the cold intolerance increases and it is accepted as pathological cold intolerance above 30 points. Because of the cold intolerance of individuals, activities such as dressing, leisure time, work were analyzed in detail considering the final question of the scale.

Findings: The mean age of the individuals was 43.32 ± 14.74 . Individuals with median nerve injury ($n = 22$) had carpal tunnel syndrome in 13, and nerve cutting in 9. Individuals with ulnar nerve injury ($n = 13$) had cubital tunnel syndrome in 4, thoracic outlet syndrome in 2, and nerve cutting in 7. The mean CISS-T score was $46,13 \pm 21,36$ in patients with median nerve injury and $44,76 \pm 25,12$ in patients with ulnar nerve injury. The mean functional loss after cold intolerance was 7.04 ± 4.79 for the median nerve and 7.07 ± 5.66 for the ulnar nerve. There was no difference between the two groups in terms of functional loss after cold intolerance and cold intolerance ($p > 0,05$).

Conclusion: There are different prevalence ratios in the literature for cold intolerance after ulnar or median nerve injury. Our results showed that cold intolerance was observed after both nerve injuries but there was no difference between the two nerves due to the functional problems of cold intolerance and cold intolerance severity. Although the numbers of the fascicles of the median and ulnar nerves are different, indifference in terms of sympathetic fiber distribution between the

two nerves support our findings. In the rehabilitation of individuals who have suffered nerve injury in the clinic, we recommend planning the treatment considering the cold intolerance of these individuals.

PP-235

Examination of patient specific functional scale according to ICF in upper limb injuries

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Objective: The Patient Specific Function Scale (PSFS) is based on verbal expression of the three most difficult functions of the patient in daily life due to injury or disease. The aim of this study was to examine the problems that patients with upper limb injuries express within the context of PSFS within the framework of the International Classification of Functioning, Disability and Health (ICF) model.

Materials and Methods: Thirty-five patients receiving treatment for upper extremity injuries were included in the study. Patients' age, sex, dominant side influence, working status and area of injury were recorded. Each of the patients was asked about the three activities that were most challenging in everyday life according to the PSFS. A total of 40 separate items, expressed by the patients were matched to ICF model components by thematic analysis techniques by an occupational therapist.

Conclusions: The average age of the patients 36 ± 15 and the female sex ratio were found to be 43%. All of the analyzed items (100%) could be matched with the ICF model components. 65% of the items indicated by the patients were assigned to the activity component, 25% to the participation component and 2.5% to the impairment component. Additionally, 7,5% of the items overlap and are included in both the activity and participation components.

Discussion: Activity component was the most affected one within the ICF model for the patients with upper limb problems. Participation was less and impair-

ment was least affected component in those patients. Therefore, PSFS items expressed by the patients may remain limited in reflecting the impairment component. For this reason, it may be appropriate to support this scale with clinical outcomes regarding impairment evaluation.

PP-247

Validity and reliability analysis of Turkish version of Edinburgh handedness inventory

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The Edinburgh Handedness Inventory (EHI) is the most common measure in determining the hand preference. It consists of 10 daily life activities and asks the patient which hand he chooses for those activities. The validity and reliability of the Turkish version of the scale were not analyzed. Therefore, the aim of this study was to adapt the EHI for Turkish speaking population and to test its validity and reliability.

The translation of EHI into Turkish was performed by 2 physiotherapists working in the hand therapy field and back-translation was done by a physiotherapist with native English. For the validity and reliability analysis of the Turkish version, healthy volunteers aged 18-30 years were included in the study. Individuals with a history of upper extremity injury within the previous year were excluded from the study. Age, gender and dominant side of the participants were recorded. Participants filled the scale twice with a 7-day interval. Test-retest reliability of the questionnaire was analyzed with Pearson's correlation analysis method.

A total of 110 participants (80 females and 30 males) included in the study and the average age was $22,5 \pm 1,9$. Only 8 participants reported their dominant side as left. It was seen that the dominant side that the participants reported completely (100%) matched with the dominant side calculated from the scale scores. It means that the right-handed individuals had a positive EHI score and the left-handed ones had negative results. EHI test and re-test scores were correlated in an "excellent" level ($r: 0.899; p < 0.01$).

Determination of hand dominance in a reliable manner

is essential for various fields from education and culture to the clinical conditions. The Turkish version of the EHI can be confidently used to determine the hand dominance in this population.

PP-251

Process of return to work for people with hand injuries

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Objective: Aim of this study is to examine the prognostic factors that affect the process of return to work patients' with hand injuries

Method: Forty five patients who had a hand injury between 2006-2016 and return to work (RTW) was participated to the study. Patients' demographic characteristics' such as age, gender, marital status, dominant hand, sick leave and time off, worker's compensation, place of injury, job change and current work performance and satisfaction (with Visual Analog Scale) was asked by a telephone interview.

Results: 30 males and 15 females were included and mean age was 38.95 ± 11.69 years. 66% of the participants were married and 51% of participants had dominant hand injuries. 76% of patients have experienced hand injuries outside the workplace Time of RTW and sick leave is respectively 62.57 ± 87.45 and 84.97 ± 88.01 days. After the injury, 13% of the participants started to work in a different job/workplace. Patients' with fracture (n=17), tendon injury (n=7), nerve injury (n=12) and crush/replantation/amputation (n=9) time of RTW is also respectively 50.71 ± 34.95 , 33.57 ± 32.52 , 44.5 ± 82.95 and 131.67 ± 141.86 . There is no difference between type of injuries and RTW ($p > 0.05$). Current work performance and satisfaction score is 8.4 ± 1.67 , 7.64 ± 3.11 . There is no difference between gender, marital status, place of injury, injury to the dominant side, worker's compensation claim and RTW ($p > 0.05$).

Conclusion: In the process of return to work, the duration of the sick leave has decreased within the sick leave period and a large part of the patients can return to work regardless of the type of injury.

PP-260

Evaluation of Semmes-Weinstein monofilament test in different conditions in healthy individuals

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Objective: It is recommended that the Semmes-Weinstein monofilament test be applied in a quiet environment, with the patient's eyes open with a file or screen so that the test cannot be seen. The aim of our study is to compare the values of the Semmes-Weinstein monofilament test applied to healthy subjects in these different conditions.

Materials and Methods: 30 individuals (23 females, 7 males) between 18-65 years of age were included in the study. Semmes-Weinstein monofilament test was applied to the individuals. The applications were repeated in three different scenarios: eyes open (EO), eyes closed (EC) and noisy environment. The test was explained to the individuals and tried. EO and EC evaluations were performed in a quiet environment. An average of 76 decibels / second noise was generated to provide a noisy environment. The test was applied in the dominant hand, 2 points in the ulnar side (1: 5th finger palmar surface of distal phalange, 2: 5th finger palmar surface of proximal phalanges) and 3 points in the median side (3: palmar surface of the distal phalanges of the second finger, 4: 2nd finger palmar surface of proximal phalange, 5: 1st finger tip).

Findings: The mean age of the individuals was 33.90 ± 11.36 (minimum 22, maximum 59). 29 of the individual's were right hand dominant, one's was left hand dominant. When EO and EC values were compared in the median region, there was a significant difference ($p < 0.05$) on the 4th and 5th surface, and there was no difference on the 3th surface ($p > 0.05$). In the ulnar region, EO and EC test were different in both points ($p < 0.05$). When the differences between the noisy and noiseless environments were compared, there was only difference between the 2 and 4 surface ($p < 0.05$).

Conclusion: As a result of the evaluations, the results of the Semmes-Weinstein monofilament test show some differences depending on the conditions. Ac-

ording to this, especially in the ulnar side, making the eyes open is more successful than the closed eyes. In a noisy and noiseless environment, the indifference in many points may be due to the fact that the individuals are mostly formed in the young population and due to working conditions. In the clinic, we think that this test should be done in a noise environment of no more than 80 decibels, so that do not disturb the hearing system and the eyes are open. However, we recommend working with larger sample groups to generalize the results.

PP-264

Investigation of smartphone usage habits in young adults

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Objective: The use of mobile phones has become a new activity in daily life, especially in young people. It has been mentioned in the literature that the recurring compulsive movements caused by long-term smartphone use in an unnatural static posture may cause musculoskeletal system problems in the upper extremity also the importance of determining smartphone usage habits at this point. The purpose of this study is to examine the habits of smartphone usage in young adults.

Materials-Methods: The study included 28 people with a mean age of $20,32 \pm 1,18$ years. Individuals' smartphone usage habits were questioned by a questionnaire structured by researchers and individuals were asked to use their smartphones and were assessed observational.

Results: 85.7% of the individuals were female, 14.3% were male and 89.3% were right-handed. It was found that people used their smartphones most frequently in sitting position (71.4%) as secondarily in supine position (28.6%), 64.3% in neutral position of the forearm and 67.9% in extension of the wrist. It was found that individuals used their smartphones most frequently for browsing the internet (75%), secondary for messaging (14.3%) and It was found that 50% of individuals use their mobile phones more than 4 hours a day. 57.1%

of the individuals were holding their smartphones on the right hand and using with their right thumb, 32.1% of them holding their smartphones on both hands and using both thumbs.

Conclusion: The usage of smartphones is quite common nowadays in the young population. As a result of the study, it has been found that individuals used their smartphones in unnatural postures for a long time. This give rise to thought that protective strategies should be developed to prevent problems that may occur in the musculoskeletal system.

PP-266

Is ankylosing spondylitis affecting hand functions in male patients?

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Aim: Although Ankylosing Spondylitis (AS) is characterized by involvement of the axial joint, involvement of the peripheral joints can also be seen throughout the disease course. The frequently affected peripheral joints in this disease are proximal joints such as the hip and shoulder. While functional deficits for these joints are mentioned in the literature, studies on hand functions are limited. Grip strength was investigated in AS patients in a limited number of studies; but the results of these studies are also conflicting. In the literature, there have been no studies investigating hand function ability in AS patients. In the light of this information, the aim of this study is to search for the answer to the question "Is the hand function affected by the AS patients?"

Method: Twenty-four patients (age: $40,08 \pm 11,09$ years, body mass index: $26,39 \pm 4,19$ kg / m²) who were diagnosed with AS according to Modify New York Criteria and 24 healthy subjects who have similar demographic characteristics ($40,04 \pm 12,69$ years, body mass index: $28,08 \pm 3,74$ kg / m²) were included. The grip strength of the cases was assessed by hydraulic hand dynamometer, hand skill level assessed by Nine-hole Peg Test (9-HPT). SPSS 20 software was used for the statistical analysis of the data obtained as a result of

the evaluations. Independent Sample T Test and Mann Whitney U Test were used to compare the measurement results of AS group and healthy control group.

Results: As a result of the study, it was seen that the grip strength of male patients with AS was decreased in both dominant side (p: 0,002) and non dominant side (p: 0,004) according to healthy cases. It was seen that the hand skill level was similar in both the dominant side (p: 0,151) and the non-dominant side (p: 0,564).

Conclusion: As a result of our study, hand skill level of AS patients is not affected but grip strength is decreased. Because of the greater activity of the distal muscles during 9-DPT may be reason of these results. while hand intrinsic muscles take primary role in activities requiring fine skill, extrinsic muscles of hand work more in tasks that require power. this may be the cause of the results we find.

PP-269

Investigation of the relationship between wrist strength, wrist proprioception and function: Pilot study

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Aim: The purpose of this study is to investigate the relationship between wrist flexion strength, gross grip strength, wrist proprioception and function.

Method: Thirteen healthy participants (age: 23,46 ± 3,86 BMI, 23,28 ± 4,43) were included in the study. The wrist flexion and extension strength was measured in a sitting position with the digital dynamometer. The hand was hanged from desk while this assessment. The gross gripping strength was assessed by digital hand dynamometer while the participant was seated, the elbow positioned at 90 ° flexion and the shoulder was at neutral position and contact with the body. Proprioception measurement was performed at sitting position and with Cybex isokinetic dynamometer. The proprioception assessment was made in 90 ° flexion of elbow, in a full supine position of the wrist, and in a support position of forearm. Purdue Pegboard hand function test was performed both unilaterally and bilaterally for both limbs in order to evaluate the function. SPSS 22

software was used for statistical analysis. The Spearman test was used to analyze the relationship between these four parameters of the wrist.

Results: As a result of analyzes, it was found that there is no relation between proprioception and any other parameter on both extremities, while there is a good relationship between gripping strength and wrist flexion and extension strengths on the dominant side (p; 0,637, 0,625, respectively). On the non-dominant side, there was a very good correlation (p; 0.868) between the wrist flexion and grip strength and a good correlation (p; 0.479) between the wrist extension strength and grip strength.

Conclusion: The absence of any relationship between wrist strength, proprioception, and function may depends on the number of participants. More accurate results can be obtained about the relationship between these parameters by increasing the number of participants.

PP-276

Examination of the validity and reliability of a mobile goniometric measurement application for the measurement of wrist normal joint motion: A pilot study

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Objective: Range of motion (ROM) measurement is frequently used during clinical practice. A universal goniometer, inclinometer, 3D analysis systems are often the preferred measurement tools for evaluation. However, nowadays smartphones are preferred in the evaluation and treatment stages of rehabilitation, with the development of technology and its place in health care applications. This allows mobile applications to be used for ROM measurement. It is necessary to determine that these applications, which have advantages over other methods in terms of being easier to implement and accessible, are valid and reliable measures in order to be used clinically. The aim of this study is to assess the validity and reliability of a free mobile application, Angle Meter, in terms of wrist flexion and extensor NEH measurements.

Material – Methods: Nineteen healthy volunteers were included to study. Participants' wrist flexion and extension movements were measured by using universal goniometer and Angle Meter. The relationship between goniometer and Angle Meter measurements was assessed for validity. The measurement with Angle Meter was repeated after 3 days to evaluate the reliability of the application. The relationship between the two measurements was evaluated by calculating the Intraclass Correlation Coefficient (ICC).

Results: According to the analysis of 38 hands involved in the study, it was found that there was a correlation between the Angle Meter and the goniometer measurements for the movement of the flexion ($p = 0,004 - r = 0,460$) and for the movement of the extension ($p = 0,000 - r = 0,594$). In the reliability analysis, the values for the flexion movement ($p = 0,000 - ICC = 0,712$) and for the extension movement ($p = 0,000 - ICC = 0,543$) were obtained.

Conclusion: According to findings, Angle Meter has good reliability for wrist flexion ROM measurement and moderate reliability for wrist extension ROM measurement. However, although there is a statistically significant correlation between the universal goniometer and Angle Meter for both measurements of ROM, the correlation coefficients obtained are not sufficient to support that Angle Meter application is a valid material for wrist flexion and extrinsic ROM measurement. It is thought that the analysis should be done with more participants.

PP-308

Is DASH an adequate outcome measure to show the functional improvements in patients with trigger finger?

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Objective: DASH is one of the most commonly used outcome measure to show functional status in patients with upper extremity problems. The questionnaire consists of thirty items and of the 30 items first 21 questions attempt to determine the amount of difficul-

ty a patient has when doing an activity. There is a debate in the literature whether activity range is suitable to measure functional improvements in different hand problems. The purpose of our study was to investigate the effectiveness of the first 21 questions of the DASH in addressing to show the functional improvements in two different hand problems.

Method: Sixteen (14 women ($56,64 \pm 8,15$ yo)), (2 men ($68,5 \pm 2,12$ yo)) trigger finger patients who had been treated conservatively included in the study. Eight patients were right, 8 patients were left hand affected. Mean follow-up of the patients was $9,06 \pm 2,48$ weeks with conservative physiotherapy. Pain severity (VAS), number of triggering (10 active fist test) and DASH were performed before and after treatment. To demonstrate the effect of the DASH on functional recovery, twenty-eight patients with distal radius fracture (DRx) (20 women $54 \pm 12,42$ yo) (8 men with $44,125 \pm 12,02$ yo) were included in the study that were treated in the same clinic and the same time period. Fourteen patients were right, 14 patients were left hand affected. Mean follow-up of the patients was $11,42 \pm 2,33$ weeks with conservative physiotherapy. Pain severity, grip strength and DASH were assessed. The responses given for each of the first 21 questions of the DASH-questionnaire in both groups were also analyzed. Pre- and post-treatment scores were compared with the Wilcoxon test.

Results: The VAS score and the number of triggers of the trigger finger patients decreased after treatment ($p < 0,05$). However, scores of only 1, 2, 5, 6, 14 questions of the DASH-questionnaire were improved ($p < 0,05$). Improvement in pain and grip strength ($p < 0,05$) and a decrease in score of 21 questions of DASH-questionnaire ($p < 0,05$) were recorded in patients with DRx.

Discussion: It was found that the scores of the 21 activities were changed following treatment in DRX patients; however, of the 21 questions, 16 could not be able to reflect the functional recovery in patients with trigger finger. It was concluded that in addition to region-specific surveys there is a need for specific outcome measures that consider personal perceptions and priorities in daily life of patients when assessing treatment effects.

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