

## 10.1

### REVIEW OF CLAW HAND DEFORMITY CORRECTION

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**Introduction:** Claw hand deformity with hyperextension of the metacarpophalangeal joints (MCPJ) and flexion deformity of interphalangeal joints (IPJ) of the ulnar fingers could cause serious impairment to patients functionally and cosmetically. Various techniques have been described to address this deformity, some of which are technically demanding and lack subjective, patient-based outcomes. Zancolli's capsulodesis had been advocated as a static procedure to correct claw hand deformity. The aim of our study is to review the outcome of a modified technique of Zancolli's capsulodesis.

**Methodology:** We retrospectively reviewed 8 cases of modified Zancolli's capsulodesis between 2014 and 2018. Patient's objective outcomes were assessed: MCPJ motion, grip strength, hand opening position. Subjective outcomes were also assessed: Michigan Hand Questionnaire, patient's satisfaction and cosmetic outcome. We also scored the use of chopsticks, mobile phones and computers.

**Results and Analysis:** The mean age was 51, with M:F = 6:2. The mean follow up was 8 months. Average operating time was 43 minutes. 14 fingers were reviewed. Objective and subjective outcome measures all reflected excellent improvement. Average 3.4 degree of flexion contracture over the MCPJ was achieved. All patients would recommend the same procedure to patients with the same deformity.

**Discussion and Conclusion:** Volar capsulodesis is a simple and attractive procedure to restore MCPJ flexion in patients with claw hand deformity with no recurrence up to 3 years in our study. Patients who received this operation showed significant improvement in terms of function and cosmesis. No meticulous rehabilitation was needed. Disadvantages of this procedure are risk of digital nerve injury.

## 10.2

### COMPARISON OF THE EFFECTIVENESS OF LUMBRICAL SPLINT AND WRIST NEUTRAL SPLINT ON PATIENTS WITH CARPAL TUNNEL SYNDROME (CTS): A SINGLE-BLIND RANDOMIZED CONTROL TRIAL

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**Introduction:** This is a prospective single-blinded (blinded assessors) randomized pilot study with two treatment groups to evaluate the effectiveness of Lumbrical splint and wrist neutral splint for improving CTS symptoms and hand function on patients with mild-to-moderate CTS in Hong Kong.

**Methodology:** 30 patients were recruited with either Lumbrical splint (treatment group) or wrist neutral splint (conventional group) fabricated for nocturnal use for 12 weeks. Primary outcome measures were Symptoms Severity Scale (CTS-SSS) and Functional Status Scale (CTS-FSS) of Chinese (HK) version of the CTS questionnaire. Secondary outcome measures included Moberg pick-up test, frequency of nocturnal awakening, moving 2-point discrimination, hand strength and Disabilities of the Arm, Shoulder and Hand. Assessments were carried at baseline, 4-week and 12-week.

**Results and Analysis:** For Lumbrical splint, One-way Repeated Measures ANOVA revealed significant improvement for CTS-SSS from 29.08±7.51 to 24.08±9.12 ( $p=0.002$ ) and reduced frequency of nocturnal awakening from 4.03±3.23 to 2.25±2.89nights/week ( $p<0.001$ ). For wrist neutral splint, significant improvements for CTS-SSS from 26.00±4.61 to 21.07±7.62 ( $p<0.001$ ), reduced nocturnal awakening from 3.14±2.85 to 1.32±2.21nights/week ( $p<0.001$ ), grip strength from 18.36±5.81kgf to 20.45±4.84kgf ( $p=0.031$ ) and pinch strength from 5.57±1.64kgf to 6.20±1.20kgf ( $p=0.042$ ). However, no significant interaction effect for splint group x time with all  $p>0.05$  was concluded.

**Discussion and Conclusion:** Lumbrical splint and wrist neutral splint have similar effect in improving symptoms and hand function. This validates the nocturnal use of either splint design in improving CTS symptoms and reducing nocturnal awakening for patients with mild-to-moderate CTS.

# Free Paper Session X: Hand and Upper Limb

## 10.3

### PROSPECTIVE COMPARATIVE STUDY OF SEVERE CARPAL TUNNEL SYNDROME WITH THENAR WASTING: OPEN CARPAL TUNNEL RELEASE + CAMITZ OPERATION VS ENDOSCOPIC CARPAL TUNNEL RELEASE + RING FINGER FLEXOR DIGITORUM SUPERFICIALIS OPPONENSPLASTY (ECTR+FDS IV OPPONENSPLASTY)

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**Introduction:** Camitz operation is a classical operative treatment for severe carpal tunnel syndrome with thenar wasting. However, other alternatives such as ECTR+FDS IV opponensplasty have some potential advantages over Camitz operation. The aim of this study is to explore if the outcomes of ECTR+FDS IV opponensplasty are comparable with those of Camitz operation.

**Methodology:** All patients who suffered from severe carpal tunnel syndrome with thenar wasting from June 2015 onwards were recruited. 7 patients received Camitz operation and 6 received ECTR+FDS IV opponensplasty. Assessments were done pre-operatively, and upon 3rd and 6th month post-operatively. Patients were assessed in terms of range of motion, Kapandji score, grip strength, pulp pinch strength, DASH score, Purdue-Pegboard score, CTS score and monofilament test. Mann-Witney U test and Wilcoxon Signed-Rank test were used to compare the results.

**Results and Analysis:** Mean age of the patients was 61.2 year-old at the time of operation. Both groups improved post-operatively in Purdue-Pegboard score (single hand) and monofilament test. In addition, when compared with Camitz group, ECTR+FDS IV opponensplasty group performed better in IPJ movement, Kapandji score, pulp pinch strength, DASH score, Purdue-Pegboard score (single hand) and CTS (function) score. In other aspects, both groups have comparable results.

**Discussion and Conclusion:** The better performance in ECTR+FDS IV opponensplasty in early post-operative period could be due to smaller wounds and hence less wound pain and less scar complications. These findings might imply that ECTR+FDS IV opponensplasty could be considered as a good alternative to the traditional Camitz operation.

## 10.4

### PREVALENCE OF ABSENCE OF THE PALMARIS LONGUS TENDON IN HONG KONG CHINESE POPULATION, CONFIRMATION BY ULTRASOUND IMAGING

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**Introduction:** Palmaris longus (PL) is a wrist flexor and is commonly used for tendon transfer or as a graft source. It's known that there is variation in the prevalence of absence of PL tendon among different ethnicity. This is the first study that combines the use of clinical tests and sonography imaging to detect the presence of PL tendon. We aim at reporting an accurate prevalence of absence of PL in Hong Kong Chinese Population.

**Methodology:** 174 subjects were randomly recruited from wards and clinic. Subjects were asked to perform Schaeffer's test. In case of clinical absence of PL, bedside ultrasound scan will be done to confirm the absence of PL. All subjects' hand grip strength of both hands was also tested by using a hand dynamometer.

**Results and Analysis:** With confirmation by sonography, the prevalence of absence of PL in HK Chinese population is 4.0%. The absence of PL tendon was found to be symmetrical in 3 subjects and asymmetrical in 4 subjects. There was no significant difference in prevalence between male and female. No correlation could be detected between the absence of PL and hand grip strength.

**Discussion and Conclusion:** Our current study provides the information of anatomically absent PL while the other previous studies provide information of clinically absent PL. However, whether a clinically absent but sonographically present PL provides a normal function and can be used for tendon transfer need to be further investigated.

## 10.5

### WIDE AWAKE SURGERY UNDER LOCAL ANAESTHESIA WITHOUT TOURNIQUET FOR ULNAR NERVE DECOMPRESSION AND MEDIAL EPICONDYLECTOMY: A PROSPECTIVE STUDY

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**Introduction:** Cubital tunnel syndrome is the second most common entrapment neuropathy. In situ decompression with or without adjunctive procedure is one of the most commonly performed operations for cubital tunnel syndrome. Conventionally ulnar nerve decompression with medial epicondylectomy was performed under general anesthesia or regional anesthesia despite its modest magnitude. Starting from 2015, our center began to perform this procedure under WALANT (wide awake surgery under local anaesthesia with no tourniquet). To investigate the efficacy of the use of WALANT under this condition, a prospective single arm study was conducted.

**Methodology:** A prospective single arm study was performed with 15 patients. 10 males and 5 females, with age ranging from 39 to 69, were included. There were 3 patients in McGowan stage 1, 1 in stage 2, and 11 in stage 3. Medial epicondylectomy were performed under local anesthesia with either 0.5 % or 1% lignocaine with 1:1000000 adrenaline without tourniquet. Subjective and objective parameters included DASH scores, Visual Analog scale, Grip and pinch power were assessed preoperatively, intraoperatively and postoperatively.

**Results and Analysis:** The mean VAS score during nerve dissection was 22. The mean VAS score during medial epicondylectomy was 12. The mean patient satisfaction with the pain control during the operation was 94 out of 100. The mean DASH scores preoperatively were 26.4 versus 13.5 postoperatively. There were no complications found in all patients included.

**Discussion and Conclusion:** This is the first report of the WALANT technique being applied to open bony procedure. Ulnar nerve decompression with medial epicondylectomy under WALANT is a safe procedure which provides a bloodless field and adequate anaesthesia for the patient.

## 10.6

### FEASIBILITY OF USING WIDE-AWAKE LOCAL ANESTHESIA AND NO TOURNIQUET (WALANT) IN TENDON TRANSFER SURGERY

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**Introduction:** WALANT allows us performing hand surgery without sedation or general anaesthesia and avoid tourniquet discomfort. The aim of the study is to assess the efficacy and safety in applying WALANT in tendon transfer surgery.

**Methodology:** From January 2014 to July 2017, 23 consecutive patients had tendon transfer surgeries performed under WALANT. Two cases received more than one tendon transfer in single operation. Retrospective study was performed and assess subjective effectiveness of WALANT via phone interview and questionnaires.

**Results and Analysis:** Eight male and twelve female patients were recruited. Average age was 57.4 (range 28 to 74). All procedures were completed without switching the anaesthetic mode or using tourniquet. Average operation time was 85.2 minutes (range 51-233 minutes) and 40.1 ml of 0.5% lignocaine with 1:100,000 adrenaline (range: 24-83 ml) was given during the procedure. Overall VAS pain score was 2.25 (multiple transfer VAS 1, range 0-10) and tendon manipulation is perceived as the most painful part of the procedure. 35% (multiple transfer 50%) of patients experienced no pain during the whole procedure at all and 40% did not take the analgesics after the operation. Only one case had mild wound ischaemia which healed uneventfully. 85% of patients prefer to use WALANT as the method of anaesthesia for their next hand surgery.

**Discussion and Conclusion:** WALANT technique is feasible and desirable in tendon transfer surgery. It allows accurate tensioning of the transfer, permits patient feedback to evaluate tendon transfer result during operation, and enables a safe procedure with adequate anaesthesia for the patient.

# Free Paper Session X: Hand and Upper Limb

## 10.7

### ARTHROSCOPIC ASSISTED REDUCTION VERSUS FLUOROSCOPIC REDUCTION AND INTERNAL FIXATION IN TREATMENT FOR UNSTABLE INTRA-ARTICULAR AO TYPE C DISTAL RADIUS FRACTURE. A REVIEW OF FUNCTIONAL AND RADIOLOGICAL OUTCOME BETWEEN TWO METHODS

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**Introduction:** Articular step off more than 2 mm in Distal radius fracture lead to poor functional results and radio-carpal arthritis. The aim of the study is to compare the functional and radiological outcome between arthroscopic assisted reduction and fluoroscopic reduction in treating unstable intra-articular distal radius fracture.

**Methodology:** Between April 2016 and March 2018, 24 patients (15 males, 9 females, average age 57.3, follow-up time 12.5 months) were recruited and randomly assigned to two groups. All patients had open reduction and fixed with volar distal radius locking plate. In Arthroscopic group, articular fragment is reduced and stabilised with K-wire arthroscopically. Signs of associated soft tissue injuries were assessed and treated accordingly. Active range of motion, grip strength, Modified Mayo Wrist (MMWS) score and Quick Disabilities of the Arm, Shoulder, and Hand (DASH), radiological assessment in distal radius parameters were assessed.

**Results and Analysis:** Arthroscopic group had statistically better restoration in volar tilt and ulnar variance with less articular stepping and gapping as well as wrist extension and flexion, forearm pronation and supination and percentage of grip strength compared with contralateral side. Arthroscopic group had 2 excellent, 2 good and 8 satisfactory results whereas fluoroscopic group had 1 good, 8 satisfactory and 3 poor results with better mean MMWS score (P=0.02). However, Quick DASH score failed to show any difference.

**Discussion and Conclusion:** Our study showed arthroscopic assisted technique precisely restore the distal radius radiological parameters with good functional outcome. Also, missing intra-articular soft tissue injury can be avoided and treated simultaneously.

## 10.8

### FIRST LOCAL CLINICAL TRIAL OF INTRA-ARTICULAR AUTOLOGOUS MESENCHYMAL STEM CELLS INJECTION FOR TREATMENT OF CHONDRAL DEFECT IN THE WRIST JOINT

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**Introduction:** Bone marrow-derived mesenchymal stem cells (BM-MSCs) are reported to promote articular cartilage regeneration in hip, knee and ankle. There is no local clinical trial nor established logistic providing MSC therapy and no such trial performed on wrist joint in literature. This is the first local clinical trial utilizing patient's autologous BM-MSC and injected into patients' wrist joint after expansion in local laboratory.

**Methodology:** Nine patients with recalcitrant post-traumatic wrist pain despite previous treatment were recruited. The clinical sign and symptom correspond to the chondral defect shown on previous arthroscopy and MRI. Arthroscopic chondral lesion debridement and bone marrow harvesting from iliac crest were performed. The marrow aspirate was subjected to BM-MSC isolation and characterization before injecting into the wrists 4 weeks later. Functional assessment and MRI were performed before, 3 and 6 months after treatment. One year follow-up arthroscopies were completed in 8 patients.

**Results and Analysis:** There was no infection or other perioperative complication noted. MRI revealed evidence of possible fibrocartilage regeneration in one patient. Arthroscopy revealed fibrous tissue covering the defects but no fibrocartilage histologically.

**Discussion and Conclusion:** Wrist joint with small traumatic defect is chosen because literatures report better result with this group. With fundamental culture medium we proved the safety and feasibility of our work-flow logistics. This first local clinical trial of autologous BM-MSC therapy for wrist chondral defect demonstrated the feasibility and safety of our workflow which lays the foundation for the development of MS therapy in local centers.

## 10.9

### LONG TERM OUTCOMES OF USING A SPHERICAL ULNAR HEAD PROSTHESIS FOR FAILED SAUV&EACUTE:-KAPANDJI PROCEDURES

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**Introduction:** Symptomatic radio-ulnar convergence continues to be the most disturbing complication following Sauv&eacute;-Kapandji (SK) procedures. This study aims to evaluate the long-term outcome of using ulnar head prosthesis (UHP) in these failed SK cases.

**Methodology:** 17 patients with confirmation of unstable ulnar stumps both clinically and radiographically were studied. The etiology for the initial SK procedure included post-traumatic distal radioulnar joint incongruity, primary DRUJ arthrosis and dysplastic DRUJ. All but 3 patients had a minimum of 2 and a maximum of 6 operations prior to having UHP. All patients suffered from severe pain with difficulty in performing work and daily activities.

**Results and Analysis:** The average follow-up was 6 years (range 4-17 years). The reduction of pain was statistically significant with 11 patients remained pain free. The range of motion of the wrist and power grip maintained to have statistically significant improvement at the late follow-up. The DASH score also significantly improved from 77 to 41. No signs of loosening of the prosthesis was noted at the late follow-up. The only 2 patients who had received cobalt chrome instead of ceramic head prosthesis developed significant osteolysis as well as pain and had to be revised to the Scheker total DRUJ prosthesis. Two patients who suffered from traumatic dorsal subluxation of the prosthesis were treated with radial osteotomy. Satisfactory outcome was noted.

**Discussion and Conclusion:** This study illustrates that the late results of ceramic spherical ulnar head prosthesis for failed SK procedures in this small but representative patient series are encouraging.

## 10.10

### OUTCOMES OF STAGE III THUMB CARPOMETACARPAL JOINT OSTEOARTHRITIS TREATED WITH ARTHROSCOPIC ARTHRODESIS

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**Introduction:** The thumb carpometacarpal joint (CMCJ) is one of the most common sites of pathology in the hand. No previous studies had reported on the results of arthroscopic arthrodesis for Eaton III Thumb CMCJ Osteoarthritis. This study prospectively evaluates the subjective and objective results of arthroscopic arthrodesis.

**Methodology:** From Jan 2015 to June 2017, 11 patients with Eaton Stage III thumb CMCJ osteoarthritis were treated with arthroscopic arthrodesis. They were evaluated objectively with grip strength, pinch strength, range of motion and Kapandji score. They were also evaluated subjectively with Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the visual analog scores (VAS) for pain. These were assessed before surgery, 3 months, 6 months and 12 months after surgery.

**Results and Analysis:** The average age was 62.2 with M:F = 2:9. The pre-treatment pain score (VAS) was average 6.4. There was improvement of pain score at post-op 3 months (VAS 3.1,  $p < 0.001$ ), 6 months (VAS 1.2,  $p < 0.001$ ) and 12 months (VAS 0.2,  $p < 0.001$ ). There was improvement of grip strength and pinch strength at 12 months ( $p < 0.001$ ). The Dash score improved at 6 months ( $p = 0.003$ ) and 12 months ( $p < 0.001$ ). There was no significant change in range of motion and Kapandji score.

**Discussion and Conclusion:** Arthroscopic arthrodesis is a feasible treatment option for Stage III thumb CMCJ osteoarthritis. It provides excellent pain relief, improvement in grip strength and pinch strength, improves hand function without compromising the thumb mobility.

### EVOLUTION OF SUBCHONDRAL BONE AND CARTILAGE CHANGES IN FIRST CARPOMETACARPAL JOINT OSTEOARTHRITIS

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**Introduction:** In osteoarthritis (OA), changes of the subchondral bone along disease progression have not been characterized. We hypothesized that in the first carpometacarpal joint (CMCJ), subchondral trabecular bone change could be an early structural feature leading to cartilage loss. Our aim was to determine the in vivo changes of subchondral microarchitecture compared with cartilage volume from early to advanced OA.

**Methodology:** A cross-sectional study on bone and cartilage morphology in patients with different severities of CMCJ OA was performed. 33 patients consecutively seen by a hand surgeon in our orthopaedic unit from August 2017 to June 2018 were recruited. Normal asymptomatic contralateral CMCJs of the patients were used as controls. Severity was staged according to the Eaton and Glickel 1987 radiographic staging. Subchondral bone analysis was done by individual trabecular segmentation of images acquired by high-resolution peripheral quantitative CT. Cartilage volume was obtained from segmentation of MRI images with an in-house program.

**Results and Analysis:** Osteoarthritic trapezia had decreased subchondral bone density vs controls (590.7 versus 631.3mgHA/mm<sup>3</sup>,  $p=0.036$ ) and decreased cartilage volume (8.76 vs 26.78  $p<0.001$ ) that correlated with disease staging. There was a significant decrease in rod thickness across the stages starting from stage 1 ( $p=0.01$ ), and a significant increase in plate-to-rod ratio from stage 2 ( $p=0.049$ ).

**Discussion and Conclusion:** This is the first in vivo study of subchondral bone microarchitecture in osteoarthritis using high-resolution CT, and demonstrated trabecular changes early osteoarthritis. Early increase in P-R ratio and transformation of rod-like to plate-like trabeculae in advanced OA may causes change in load-bearing properties, and ultimately cartilage damage.

## 10.12

### TFCC FOVEAL TEAR ARTHROSCOPIC REINSERTION: PERIFOVEAL REINSERTION COMPARED TO TRANS OSSEOUS TECHNIQUE

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**Introduction:** Several arthroscopic techniques are described to repair foveal tear of the Triangular Fibro Cartilage Complex (TFCC). This study compares perifoveal reinsertion of TFCC foveal tear to trans osseous reinsertion.

**Methodology:** This retrospective study compared 17 patients with foveal tear of the TFCC: 10 was treated with perifoveal technique (Group A) and 7 patients with trans osseous reinsertion (Group B). The average age was 40-year-old (range 21 to 58). The two groups were comparable according the age, the follow up and the delay before surgery. All patients had isolated foveal tear diagnosed by a painful DRUJ instability and positive arthroscopic tests (Hook test and Trampoline test). Operations were performed under regional or local anaesthesia. In group A, TFCC reinsertion was performed by an inside-out technique using 19G epidural needle to introduce multiple stitches of 2'0 PDS suture surrounding the foveal region to fix the TFCC in horizontal mattress manner. In group B, TFCC tear was fixed with an outside-in technique through drill hole at distal ulna. Post-operative rehabilitation protocol was same. We evaluated pre and postoperative range of motion, grip strength and pain with Visual Analogue Scale (VAS). Functional results were evaluated with the Disability of Arm Shoulder and Hand (DASH) score, the Modified Mayo Wrist Score (MMWS) and the Prince of Wales Hospital (PWH) Wrist Performance score.

**Results and Analysis:** At a mean follow up of 19.5 months (range 6 to 157), the mean VAS score was 1.8 and mean grip strength was 82.7% compared to the opposite side with no statistical significant difference between the two groups. Mean prono-supination was 156.4° with a significant better improvement in group A ( $p=0.04$ ). Concerning the functional outcomes, mean DASH score was 22.9, PWH Wrist Performance score was 35 out of 40 and MMWS was 70 with no significant statistical difference. Two patients had recurrence of DRUJ instability, one in each group. No persistent injury of the dorsal ulnar nerve branch was observed. Age, delay before surgery and ulnar variance did not influence the postoperative DRUJ stability and functional outcomes.

**Discussion and Conclusion:** In summary, our study showed that both perifoveal TFCC repair and trans-osseous techniques can provide satisfactory results. In our experience, perifoveal reinsertion is an effective technique easy to perform even under local anesthesia without tourniquet, enables multiple stitch application to restore the foot-print of TFCC, and gives a better functional range of motion.

## 10.13

### EFFECTIVE PERIOD OF CONSERVATIVE TREATMENTS IN PATIENTS WITH CALCIFIC PERIARTHRITIS OF THE HAND

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**Introduction:** Calcific periartthritis of the hand is a relatively uncommon painful condition with juxta-articular deposits of amorphous calcium hydroxyapatite. Although conservative treatments including nonsteroidal anti-inflammatory drugs (NSAIDs) medication has been generally regarded effective, there is not much evidence about how long they could be effective.

**Methodology:** We retrospectively reviewed 11 patients who were diagnosed as calcific periartthritis of the hand from January 2015 to June 2018. We recommended the use of warm baths, NSAIDs and limitation of the activity as an initial treatment. If the pain persisted in spite of the at least 3-months conservative treatments, we explained surgical treatment options. If the pain improved, we recommended gradual range of motion exercises with continuation of daily NSAIDs. Each visual analog scale (VAS) for pain at every 3 months visit (3 months, 6 months, 9 months) were compared with that of previous visit using paired sample t-test to investigate whether the pain had decreased or not during each time interval.

**Results and Analysis:** Except one patient with immediate surgical reconstruction of collateral ligaments, 10 patients continued the conservative treatments for average 11.1 months. Average pain VAS score at initial visit was 7, while that of 3 months, 6 months and 9 months were 4.3, 3.3 and 2.9 respectively. There was significant reduction in pain VAS scores between at initial and 3 months, and between at 3 months and 6 months ( $P$ -value = 0.004 and 0.009 respectively). However, there was no significant change of pain VAS scores between at 6 months and 9 months ( $P$ -value = 0.598).

**Discussion and Conclusion:** Patients with calcific periartthritis of the hand suffered from pain for relatively prolonged period. Those who continued the conservative treatments including NSAIDs medication showed relieved pain up to 6 months follow up.