

Current Concept Reviews :Oct-Dec 2016

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Current Concepts

It is a section devoted to give the readers a general panorama over all the news of other scientific sources out of Acta of Shoulder and Elbow Surgery.

In this edition you will find a brief summary, smaller than the abstract, of papers from the last editions of Arthroscopy Journal and Journal of Shoulder and Elbow Surgery. Our aim is that our reader can be in touch with all news from our and other sources. In a near future our team will work hard in order to add summaries from more periodicals.

This section was created by a collaboration of many shoulder and elbow surgeons as listed above in the authors list

Arthroscopy Journal Reviews

Suture Anchor Biomechanics After Rotator Cuff Footprint Decortication

Hyatt AE, Lavery K, Mino C and Dhawan A *Arthroscopy*. 2016 Apr;32(4):544-550.

The objective was to identify the biomechanical consequences of violating the cortical shelf when preparing the greater

tuberosity for suture anchor repair. Anchors were tested under cyclic loads followed by load-to-failure testing. Regression analysis showed positive correlations with female gender and decreased bone mineral density. Thereby, the decortication of the rotator cuff footprint significantly decreases the pullout strength of the suture anchor. Gender and bone mineral density also play a significant role in bone-anchor biomechanics and should be considered during repair. Therefore, caution should be exercised when preparing the rotator cuff footprint before suture anchor placement because of the significant risk of early repair failure at the bone-anchor interface.

Effect of Teres Minor Fatty Infiltration on Rotator Cuff Repair Outcomes

Kim JK, Yoo HJ, Jeong JH and Kim SH *Arthroscopy*. 2016 Apr;32(4):552-558

The objective was to observe changes in fatty infiltration (FI) of the teres minor without tear of the teres minor in a postoperative magnetic resonance imaging and to evaluate the influence of FI of the teres minor in the clinical outcomes of rotator cuff repair. Methods: Of 816 patients who underwent rotator cuff repair, 51

(6.3%) had FI of the teres minor without tear involvement and 30 cases were available for postoperative magnetic resonance imaging. Thus, it was verified the degree of FI was not related to the amount of tendon

involvement of a rotator cuff tear. All postoperative functional outcome scores significantly improved, and there were no significant differences compared with that of the control group. In most of the cases, FI of the teres minor was unchanged. With this, the conclusion was reached that FI of the teres minor without tear involvement can be observed in a rotator cuff tear as a possibly incidental finding of unknown clinical significance. Nevertheless, the functional outcomes of the repair were successful; therefore, rotator cuff repair can be performed without a great deal of concern in the presence of FI in the teres minor.

Which Is Better for Arthroscopic Tenodesis of the Long Head of the Biceps: Soft Tissue, or Bony Interference Fixation?

Hwang JT, Yang CJ, Noh KC, Yoo YS, Hyun YS, Lee YB and Liu X

Arthroscopy. 2016 Apr;32(4):560-567

To compare the outcome between arthroscopic soft tissue tenodesis (STT) at the rotator interval and bony interference fixation tenodesis (BIFT) at the distal bicipital groove for the long head of the biceps (LHB), were used American Shoulder and Elbow Surgeons scores, Constant score, and elbow flexion strength index (EFSI). Were checked preoperatively, postoperative 1 year and 2 years. Ultrasound imaging evaluation took place at 1 year and 2 years postoperatively as well. Thereby overall functional outcomes improved after surgery in both groups. However, the Arthroscopic BIFT for the LHB showed better improvement in EFSI than

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arthroscopic STT. In addition, the STT group showed a higher failure rate than the BIFT group.

The Effects of Arthroscopic Lateral Acromioplasty on the Critical Shoulder Angle and the Anterolateral Deltoid Origin: An Anatomic Cadaveric Study
Os efeitos da acromioplastia lateral artroscópica no ângulo crítico do ombro e a origem anterolateral do deltoide: um estudo anatômico em cadáveres.

Katthagen JC, Marchetti DC, Tahal DS, Turnbull TL and Millett PJ
Arthroscopy. 2016 Apr;32(4):569-575.
The objective was To investigate if an anterolateral acromioplasty and a lateral acromion resection alter the critical shoulder angle (CSA) without affecting the deltoid origin. First, the native CSAs of 10 human cadaveric shoulders were determined with the use of fluoroscopy. It was detected that: The mean native CSA was reduced significantly by acromioplasty and further reduced by lateral acromion resection. Anterolateral acromioplasty reduced the CSA by a mean of 1.4°, and in combination with lateral acromion resection, the CSA was reduced by a mean of 2.8°. In all specimens (5 of 5) with a presurgery CSA of 35° or greater, the CSA was reduced to the range of 30° to 35° by the combination of both techniques. The acromial deltoid attachment was found to be well preserved in all specimens. With this, it is concluded that: Arthroscopic anterolateral acromioplasty and a 5-mm lateral acromion resection each reduced the CSA significantly and did not damage the deltoid origin. Clinical Relevance: The combination of both techniques could potentially be used in clinical practice to reduce a CSA greater than 35° to the desired range of 30° to 35°.

Arthroscopic Treatment of Lateral Epicondylitis: Tenotomy Versus Debridement

Solheim E, Hegna J, Øyen J and Inderhaug E
Arthroscopy. 2016 Apr;32(4):578-585.
The objective was to compare the outcome of 2 arthroscopic techniques for treating lateral epicondylitis. Conducted during 2 different time periods: April 2005 to

October 2007 (tenotomy) and May 2009 to June 2010 (debridement). Thereby a total of 326 patients fulfilling the requirements for inclusion in the study, 283 patients were followed up, 204 in the tenotomy group and 79 in the debridement group. Therefore both arthroscopic methods lead to a significant improvement of pain and function, and no statistically significant difference was found in any outcome parameters between the 2 techniques at this minimum 4-year evaluation. The results indicate that tenotomy of the extensor carpi radialis brevis may be an unnecessary step in the arthroscopic treatment of lateral epicondylitis. Debridement only is a potentially less costly procedure, and the current finding of a mean 2 weeks shorter sick leave in the debridement only group proposes a substantial cost saving in a societal perspective.

Current Practice for the Surgical Treatment of SLAP Lesions: A Systematic Review

Kibler WB and Sciascia A
Arthroscopy. 2016 Apr;32(4):669-683.
The aim of this study was to analyze current literature reporting surgical treatment of SLAP lesions to examine the consistency of reported surgical details (surgical indications, surgical technique, and postoperative rehabilitation) that are deemed important for best treatment outcomes and to try to establish a consensus regarding treatment. Then a systematic review of papers reporting surgical treatment of a SLAP lesion was performed. Each paper was analyzed for the description of (1) the arthroscopic indications for surgery; (2) surgical aspects including type, location, and number of anchors and sutures; (3) description of criteria for determination of completeness of the repair; and (4) postoperative rehabilitation details. Therefore twenty-six papers were included, with 12 focused on isolated SLAP repair and 14 focused on combined SLAP repair with other lesions. Thereby, current practice of treating SLAP lesions is controversial, some of which results from imprecision in the treatment. This study demonstrated a wide variability in the reported arthroscopic indications for repair and the specific technical details to

accomplish the repair.

Factors Affecting Clinical Outcome in Patients With Structural Failure After Arthroscopic Rotator Cuff Repair

Nakamura H, Gotoh M, Mitsui Y, Honda H, Ohzono H, Shimokobe H et al.
Arthroscopy. 2016 May;32(5):732-739.
Retrospective study to compare clinical outcomes between patients with lesions of the large or massive rotator cuff that had healing or structural failures of post-operative repair (re-rupture after complete or partial repair) and (2) to identify factors associated with the results clinical in patients with post-operative structural failure.

Based on intraoperative findings and MRI at the end of follow-up, patients were divided into three groups: cured group, re-rupture group (after complete repair) and group partial repair.

The extent of tendon rehabilitation at the top facet, middle and lower and lower tuberosity were examined in magnetic resonance imaging at the end of follow-up. In re-break groups and partial repair, preservation of the tendon in the mean facet significantly affected the JOA score and UCLA.

The only clinical factor that affected patient outcomes was the healing of the tendon in the media facet. Thus the preservation of the tendon on the facet average was a predictor of good clinical outcomes in patients undergoing arthroscopic repair of the large or massive rotator cuff tears who had postoperative structural failure.

Clinical Results After Conservative Management for Grade III Acromioclavicular Joint Injuries: Does Eventual Surgery Affect Overall Outcomes? [Petri M, Warth RJ, Greenspoon JA, Horan MP, Abrams RF, Kokmeyer D et al](#)

Arthroscopy. 2016 May;32(5):740-746.
This study compares the clinical outcomes in patients with lesions of the acromioclavicular joint (AC) grade III in which conservative treatment was successful and those who have failed conservative treatment and progressed to surgical treatment.

The most important finding of this study

was that patients who have failed conservative treatment and underwent further joint reconstruction AC had similar results when compared to those who successfully completed the conservative treatment after a median follow-up period of 3.3 years. However at the end time of follow-up, patients who underwent joint reconstruction possible AC were more likely to return to its level of sports participation pre-injury intensity. Patients who presented clinical over 30 days after the initial injury were more likely to have failed conservative treatment and showed significant reduction in mean scores postoperative SANE and SF-12 PCS when compared with the rest of the group.

Clinical, Radiographic, and Surgical Presentation of Subscapularis Tendon Tears: A Retrospective Analysis of 139 Patients

[Naimark M, Zhang AL, Leon I, Trivellas A, Feeley BT and Ma CB.](#)

Arthroscopy. 2016 May;32(5):747-752. Retrospective study of 139 patients to evaluate and correlate clinical, radiographic and arthroscopic findings of subscapularis (SE) tears, either isolated or combined with other rotator cuff tendon lesion. The size of lesions were arthroscopically classified as upper third, two-thirds or full tears. All patients had a positive physical exam and MRI assessing associated injuries. Data were plotted according to the size of SE lesion. Diagnosis of SE tears remains a challenge because of limited sensitivity of MRI and physical exam. MRI sensitivity is directly proportional to size of SE tear, while physical exam does not depend on it. Additional factors that correlate to increased SE tear size identified in this study are history of trauma, supraspinatus and biceps tears.

Triple-Loaded Single-Row Versus Suture-Bridge Double-Row Rotator Cuff Tendon Repair With Platelet-Rich Plasma Fibrin Membrane: A Randomized Controlled Trial Barber FA

Arthroscopy. 2016 May;32(5):753-761 Prospective randomized trial comparing healing and clinical outcomes of triple-loaded single-rows versus suture-bridging double-row repairs of full-thickness rotator cuff tears, both constructs received platelet-

rich plasma fibrin membrane augmentation. Evaluation was done by magnetic resonance imaging (MRI) at 12 months postoperatively and by secondary clinical outcomes.

3 out of 20 triple-loaded single-row repairs and 3 out of 20 suture-bridge double-row repairs (15%) had tear relapse at 12 month follow-up MRIs. On the first group all tears failed at the original attachment site (Cho type 1), while tears on the second group failed medially to medial row at muscle-tendon interface (Cho type 2).

Clinical outcomes found no statistical difference between both groups postoperatively

The Impact of Fatigue on Baseball Pitching Mechanics in Adolescent Male Pitchers

[Erickson BJ, Sgori T, Chalmers PN, Vignona P, Lesniak M, Bush-Joseph CA et al](#)

Arthroscopy. 2016 May;32(5):762-71. Study to determine shoulder and elbow kinematics, pitching velocity and accuracy and pain changes during a simulated baseball game in adolescent pitchers. As pitchers progressed through a simulated game, their pitching throw velocity diminished, they got fatigued and pain increased. Core and leg muscles got fatigued earlier than upper-limb kinematics changed. Basis of these results, core and leg strengthening may be valuable adjuncts to prevent upper-limb injury in adolescent pitchers.

Does the Use of Platelet-Rich Plasma at the Time of Surgery Improve Clinical Outcomes in Arthroscopic Rotator Cuff Repair When Compared With Control Cohorts? A Systematic Review of Meta-analyses

[Saltzman BM, Jain A, Campbell KA, Mascarenhas R, Romeo AA, Verma NN et al.](#)

Arthroscopy. 2016 May;32(5):906-918. Systematic review of meta-analyses evaluating use of platelet-rich plasma (PRP) at the time of arthroscopic rotator cuff repair and determine its effect on re-rupture rates and clinical outcomes. Seven meta-analyses and a total of 3,193 patients with 12 to 31 months of mean follow-up. Overall, when compared to controls, the use of PRP at the moment of the rotator cuff repair had

no significant results in lowering rates of re-rupture neither improving clinical scores. However a subgroup of 3 meta-analyses showed best results in the following scenarios: solid matrix PRP against liquid matrix; small or medium rotator cuff tears against large or massive ones; injection of PRP in tendon-to-bone interface against injection on tendon; and, double-row attachment against single-row. Level of Evidence: Level III, systematic review level II and III studies.

Treating Subscapularis and Lesser Tuberosity Avulsion Injuries in Skeletally Immature Patients: A Systematic Review. [Vavken P, Bae DS, Waters PM, Flutie B and Kramer DE.](#)

Arthroscopy. 2016 May;32(5):919-928.

Study to develop evidence-based recommendations for the diagnosis and treatment of subscapularis injury and injuries spare the small tuberosity in young patients

We identified 32 publications on 60 patients with a mean age of 13.5 / 1.7 years. The most common physical examination found at diagnosis was anterior shoulder pain, followed by weakness of the subscapularis muscle. The sensitivity of the X-ray image was 16% and 95% for MRI. The average time of diagnosis was two months. 60 patients, 10 (17%) underwent successful conservative treatment. Fifty patients (83%) underwent surgical correction, with no differences in clinical outcomes after open versus arthroscopic repair. Five cases (8%) when identified and treated late, were associated with sub-optimal results and shoulder pain continues.

Subscapularis avulsion injuries and less tuberosity in young patients are more commonly seen in males during early adolescence. It should be suspected in patients with anterior shoulder pain and weakness of the subscapularis muscle, especially after a fall on the outstretched arm or on eccentric external rotation. MRI should be considered early even if the radiographic findings are negative. open and arthroscopic repair are effective in restoring function, the setting respects the immature bone less tuberosity.

Surgical Versus Nonoperative Treatment in Patients Up to 18 Years Old With

Traumatic Shoulder Instability: A Systematic Review and Quantitative Synthesis of the Literature

[Longo UG, van der Linde JA, Loppini M, Coco V, Poolman RW and Denaro V. Arthroscopy. 2016 May;32\(5\):944-952.](#) Study to compare the results of surgical treatment and conservative in patients 18 years or less with traumatic instability of the shoulder. Fifteen articles, a total of 693 patients with 705 shoulders with 18 years or less. 411 shoulder, 293 (71.3%) treated with a conservative approach had redislocation compared with shoulders 55 of 314 (17.5%) who had been surgically treated. The results of the quantitative synthesis of recurrence rate was significantly lower in the surgical group compared to the conservative group. The recurrence rate is lower in patients undergoing surgery. More studies are needed to clarify several points in the treatment of young patients with traumatic instability of the shoulder.

Comparison of Treatments for Superior Labrum-Biceps Complex Lesions with Concomitant Rotator Cuff Repair: A Prospective, Randomized, Comparative Analysis of Debridement, Biceps Tenotomy, and Biceps Tenodesis.

[Oh JH, Lee YH, Kim SH, Park JS, Seo HJ, Kim W et al. Arthroscopy. 2016 Jun;32\(6\):958-967.](#)

Compared clinical outcomes in patients with concomitant superior labrum-biceps complex (SLBC) lesions and rotator cuff tears who underwent arthroscopic rotator cuff repair, according to 3 different treatment methods (simple debridement, biceps tenotomy, or biceps tenodesis) for the SLBC lesions. One hundred twenty patients who underwent arthroscopic rotator cuff repair with SLBC lesions (biceps partial tears <50%, partial pulley lesions, and type II SLAP lesions) were enrolled in this prospective comparative study and randomly assigned to 1 of 3 treatment groups. Patients with isolated subscapularis tears or osteoarthritis were excluded. Finally, 86 patients (Deb in 28, BTo in 27, and BTd in 31) were analyzed (mean follow-up, 22.1 ± 7.72 months; mean age, 58.98 ± 7.8 years). Pain; functional, clinical, and

radiologic outcomes; and the strength index of elbow flexion and forearm supination were analyzed.

All 3 treatments improved pain and function. Simple debridement showed the lowest risk of the Popeye deformity and preserved forearm supination strength. Biceps tenotomy and tenodesis may be preferable for selected patients: biceps tenotomy for patients with definite bicipital groove tenderness and biceps tenodesis for patients, especially male patients, with bicipital groove tenderness who want to preserve supination strength.

Morphology of the Lesser Tuberosity and Intertubercular Groove in Patients with Arthroscopically Confirmed Subscapularis and Biceps Tendon Pathology.

[Shah SH, Small KM, Sinz NJ and Higgins LD. Arthroscopy. 2016 Jun;32\(6\):968-975.](#)

Evaluated association between the morphology of the lesser tuberosity and intertubercular groove and subscapularis tendon tears and biceps tendon pathology. Sixty-six patients with arthroscopically confirmed subscapularis tendon tears were compared with 59 demographically matched control patients who underwent magnetic resonance imaging or computed tomography arthrography examination of the shoulder. Measurements of the lesser tuberosity and intertubercular groove included maximum depth of the intertubercular groove, intertubercular groove depth at the midpoint of the glenoid, lesser tuberosity length, length from the top of the humeral head to the point of maximum depth of the intertubercular groove, length from the top of the humeral head to the top of the lesser tuberosity, and medial wall angle and depth. Patients with subscapularis tears showed a significantly decreased depth of the intertubercular groove at the mid glenoid ($P = .01$), shorter length of the lesser tuberosity ($P = .002$), and greater distance from the top of the humeral head to the top of the lesser tuberosity ($P = .02$). There was a trend toward a decreased medial wall angle ($P = .07$) and greater distance from the top of the humeral head to the point of maximum intertubercular groove depth ($P = .06$). Patients with biceps tendon

pathology showed a significantly decreased depth of the intertubercular groove at the mid glenoid ($P = .001$), shorter length of the lesser tuberosity ($P = .0003$), greater distance from the top of the humeral head to the top of the lesser tuberosity ($P = .01$), and decreased medial wall angle ($P = .01$) and depth ($P = .03$).

There are several morphologic factors related to the lesser tuberosity and intertubercular groove that are associated with both subscapularis tendon tears and biceps tendon pathology.

SLAP Lesions: Trends in Treatment.

[Erickson BJ, Jain A, Abrams GD, Nicholson GP, Cole BJ, Romeo AA et al. Arthroscopy. 2016 Jun;32\(6\):976-981.](#)

To determine the trends in SLAP repairs over time, including patient age, and percentage of SLAP repairs versus other common shoulder arthroscopic procedures, The records of 4 sports or shoulder/elbow fellowship trained orthopaedic surgeons were used to identify the total number of common shoulder arthroscopic cases performed between 2004 and 2014 using current procedural terminology codes (CPT): 29822, 29823, 29826, 29827, 29806, 29807, 29825, and 29828. The number of SLAP repairs (CPT code 29807) as a combined or isolated procedure were recorded, and the classification of SLAP type was undertaken using operative reports. Patient age was recorded. Linear regression was used to determine statistical significance.

There were 9,765 patients who underwent arthroscopic shoulder procedures using the defined CPT codes between 2004 and 2014 by our 4 orthopaedic surgeons. Of these, 619 underwent a SLAP repair (6.3%); average age 31.2 ± 11.9 . The age of patients undergoing SLAP repair significantly decreased over time. Most SLAP repairs were performed on type II SLAP tears. The percentage of SLAP repairs compared with the total number of shoulder arthroscopic surgeries and total number of patients who underwent SLAP repair significantly decreased over time. Conversely, the number and percentage of biceps tenodeses are increasing over time. Over the past 10 years, the total number of biceps tenodeses has increased, whereas the

number and relative percentage of SLAP repairs within our practice have decreased. The average age of patients undergoing SLAP repair is decreasing, and most SLAP repairs are performed for type II SLAP tears.

Effect of Coracoid Drilling for Acromioclavicular Joint Reconstruction Techniques on Coracoid Fracture Risk: A Biomechanical Study.

[Martetschlager F, Saier T, Weigert A, Herbst E, Winkler M, Henschel J, et al.](#)

[Arthroscopy. 2016 Jun;32\(6\):982-987.](#)

To biomechanically compare the stability of the coracoid process after an anatomic double-tunnel technique using two 4-mm drill holes or a single-tunnel technique using one 4-mm or one 2.4-mm drill hole. For biomechanical testing, 18 fresh-frozen cadaveric scapulae were used and randomly assigned to one of the following groups: two 4-mm drill holes (group 1), one 4-mm drill hole (group 2), or one 2.4-mm drill hole (group 3). After standardized coracoid drilling, load was applied to the conjoined tendons at a rate of 120 mm/min and ultimate failure load, along with the failure mode, was recorded.

There was no significant difference between groups regarding load to failure. Mean load to failure in group 1 was 392 N; group 2, 459 N; and group 3, 506 N. However, the failure mode for the group with one 4-mm drill hole and the group with two 4-mm drill holes was coracoid fracture, whereas the group with one 2.4-mm drill hole showed 5 tears of the conjoined tendons and only 1 coracoid fracture.

Although there was no significant difference regarding load-to-failure testing between groups, the failure mechanism analysis showed that one 2.4-mm drill hole led to less destabilization of the coracoid than one or two 4-mm drill holes.

Qualitative Assessment and Quantitative Analysis of the Long Head of the Biceps Tendon in Relation to the Pectoralis Major Tendon Humeral Insertion: An Anatomic Study.

[Nossov SB, Ross JR, Robbins CB and Carpenter JE.](#)

[Arthroscopy. 2016 Jun;32\(6\):990-998.](#)

To qualitatively assess and to quantitatively

analyze the long head of the biceps tendon (LHBT) in the region of the pectoralis major (PM).

From 11 fresh cadaveric donors, 20 cadaveric shoulders without operative scars were dissected-mean age, 76.9 years. The LHBT circumference was measured at the anterior edge of supraspinatus, suprapectoral, midpectoral, and subpectoral. The muscle was then removed from the LHBT and the circumference was again measured at the supra-, mid-, and subpectoral levels. These data were used to calculate the area of the tendon. All measurements were performed by 2 independent observers. Statistical analysis was performed to assess reliability of data and the difference between serial measurements.

The mean calculated percentage tendon decreased from 86.7% at the superior edge of the PM to 49.8% at the midpoint of the PM and to 17.5% at the inferior edge of the PM. Distal to the PM, the LHBT was composed of a small percentage of tendon to muscle, which may have implications for the mechanical strength of fixation of tenodesis. The anatomic location of the musculotendinous junction of the LHBT began proximal to the superior edge of the PM tendon, which implies that restoration of anatomic tensioning may require a more proximal docking site than previously described. Tenodesis performed between the midpoint of the PM insertion and more distal points involves a significant portion of muscle, which may not be optimal.

Major Peripheral Nerve Injuries After Elbow Arthroscopy.

[Desai MJ, Mithani SK, Lodha SJ, Richard MJ, Leversedge FJ and Ruch DS.](#)

[Arthroscopy. 2016 Jun;32\(6\):999-1002.](#)

To survey the American Society for Surgery of the Hand membership to determine the nature and distribution of nerve injuries treated after elbow arthroscopy. An online survey was sent to all members of the American Society for Surgery of the Hand under an institutional review board approved protocol. Collected data included the number of nerve injuries observed over a 5-year period, the nature of treatment required for the injuries, and the outcomes observed after any intervention. Responses were anonymous, and results were securely

compiled. We obtained 372 responses. A total of 222 nerve injuries were reported. The most injured nerves reported were ulnar, radial, and posterior interosseous (38%, 22%, and 19%, respectively). Nearly half of all patients with injuries required operative intervention, including nerve graft, tendon transfer, nerve repair, or nerve transfer. Of the patients who sustained major injuries, those requiring intervention, 77% had partial or no motor recovery. All minor injuries resolved completely. Our results suggest that major nerve injuries after elbow arthroscopy are not rare occurrences and the risk of these injuries is likely under-reported in the literature. Furthermore, patients should be counseled on this risk because most nerve injuries show only partial or no functional recovery. With the more widespread practice of elbow arthroscopy, understanding the nature and sequelae of significant complications is critically important in ensuring patient safety and improving outcomes.

The Safety of Using Proximal Anteromedial Portals in Elbow Arthroscopy with Prior Ulnar Nerve Transposition.

[Park SE, Bachman DR and O'Driscoll SW.](#)

[Arthroscopy. 2016 Jun;32\(6\):1003-1009.](#)

To report the safety of using the proximal anteromedial portal, using a simplified ulnar nerve management strategy derived from an earlier study, in a series of patients with previously transposed ulnar nerves. A retrospective review of all elbow arthroscopies performed by a single surgeon from 2009 to 2014 was performed. The following techniques were used if, by palpation, localization of the ulnar nerve was considered to be certain (group 1) or uncertain (group 2): In group 1 (certain) the proximal anteromedial portal was established in the normal antegrade fashion. In group 2 (uncertain) a 1 to 3cm incision was made at the planned proximal anteromedial portal site, and blunt dissection down to the capsule was performed without identification of the nerve. The nerve was not visualized but sometimes was palpated through the wound to confirm its location anteriorly or posteriorly. If there was a disparity between the prior operative records and the physical examination findings, the nerve was

explored through a 3- to 4-cm incision. We reviewed 394 elbow arthroscopy cases, 22 of which had a prior transposed ulnar nerve (21 subcutaneous and 1 submuscular) that required anterior-compartment arthroscopic surgery. Group 1 (certain location) consisted of 9 elbows (41%), whereas group 2 (uncertain location) consisted of 13 (59%). In 2 cases in group 2, the ulnar nerve was explored because of the disparity between the previous medical records and the physical examination findings. There were no operative ulnar nerve injuries related to the use of the proximal anteromedial portal. The proximal anteromedial portal was able to be used safely in patients with prior transposition of the ulnar nerve. This was achieved by using an algorithm based on the degree of certainty with which the nerve can be localized in the region of the planned portal by clinical palpation. Level of Evidence: Level IV, therapeutic case series

Evaluation of factors affecting acute postoperative pain levels after Arthroscopic Rotator Cuff Repair.

Cuff DJ, O'Brien KC, Pupello DR and Santoni BG. *Arthroscopy*. 2016 Jul;32(7):1231-6.

181 patients underwent arthroscopic RC surgery along with subacromial decompression.

Preoperative subjective pain tolerance, notably those patients rating themselves as having an extremely high pain tolerance, was the most significant predictor of high VAS pain scores on both postoperative day 1 ($P = .0001$)

Pre operative narcotic use was also significantly predictive ($p=.010$) of high pain scores on postoperative day 1 and day 7 ($p=.019$) along with nonsmokers ($p=.008$) and younger patients ($p=.006$) being predictive on day 7. There were no patients factor that were predictive of VAS Scores 3 months postoperatively ($p=.567$).

Preoperative subjective pain tolerance, notably those patients rating themselves as having an extremely high pain tolerance, was the strongest factor predicting high acute pain levels after arthroscopic rotator cuff surgery. Preoperative narcotic use, smokers, and younger patients were also predictive of higher pain levels during the first

postoperative week.

The Cost-Effectiveness of using Platelet-Rich Plasma during Rotator Cuff Repair: A Markov Model Analysis.

Eric M. Samuelson, Susan M. Odum, James E. Fleischli. *Arthroscopy*. 2016 Jul;32(7):1237-1244.

The cost per quality-adjusted life-year (\$/QALY) of RCR with and without PRP was \$6,775/QALY and \$6,612/QALY, respectively. In our base case, the use of PRP to augment RCR was not cost-effective because it had exactly the same "effectiveness" as RCR without augmentation while being associated with a higher cost (additional \$750). Sensitivity analysis showed that to achieve a willingness-to-pay threshold of \$50,000/QALY, the addition of PRP would need to be associated with a 9.1% reduction in retear rates. If the cost of PRP were increased to \$1,000, the retear rate would need to be reduced by 12.1% to reach this same threshold. This compared with a necessary reduction of only 6.1% if the additional cost of PRP was \$500.

This cost-utility analysis shows that, currently, the use of PRP to augment RCR is not cost-effective.

Biomechanical Comparison of All-Suture Anchor Fixation and Interference Screw Technique for Subpectoral Biceps Tenodesis..

Florence L. Chiang, Chih-Kai Hong, Chih-Hsun Chang, Cheng-Li Lin, I-Ming Jou, Wein-Ren Su. *Arthroscopy*, 32(7): 1247-1252.

To compare the biomechanical characteristics of the subpectoral Y-knot all-suture anchor fixation with those of the interference screw technique.

The all-suture anchor fixation is an alternative technique for subpectoral biceps tenodesis even at greater displacement when compared with the interference screw fixation during cyclic and failure loading.

Outcomes of Bankart Repairs Using Modern Arthroscopic Technique in an Athletic Population.

Charles Milchteim, Scott A. Tucker, Darin D. Nye, Richard J. Lamour, Wei Liu, James R. Andrews, Roger V. Ostrander. *Arthroscopy*, 32(7): 1263-1270.

A retrospective analysis of all patients with a history of trauma to their shoulder resulting in an anterior shoulder dislocation was performed. Both primary and revision arthroscopic Bankart repairs using bioabsorbable anchors with at least two-year follow-up were included. The recurrence rate was 6/94 (6.4%) at a mean follow-up of 4.3 years (range 2.3 - 8.3). The mean postoperative scores were as follows: ASES=91.5/100; Rowe=84.3/100; VAS=0.8/10; satisfaction=8.8/10. Return to sports at the previous level for at least one season was possible in 88% of patients. Statistical analyses revealed a significant increase in risk of recurrence amongst high school and recreational athletes. No recurrences were observed amongst professional or college level athletes. No significant difference in recurrence rates were observed in regards to age, time to surgery, type of athlete (collision vs limited contact), repair of SLAP lesion, number of anchors, overhead athlete or revision surgery.

In conclusion, arthroscopic Bankart repairs can yield excellent results in highly active patients. Particular attention should be paid to the younger, underdeveloped athletes as they may be at higher risk for recurrence.

Treatment of Ulnar Collateral Ligament Injuries and Superior Labral Tears by Major League Baseball Team Physicians.

Erickson BJ, Harris JD, Fillingham YA, Cvetanovich GL, Bush-Joseph CA, Bach BR Jr., Romeo AA and Verma NN. *Arthroscopy*, 32(7): 1271-1276.

Seventy-four MLB team orthopedic surgeons were surveyed via an online survey system. A 14-question survey was used to assess surgeon experience, technique, and graft choice for UCL reconstruction (UCLR), treatment of type II SLAP tears, and other common pathologic conditions. Thirty team orthopaedic surgeons (41%) responded (mean experience as team physicians: 9.37 ± 6.33 years). Seventeen (56.7%) surgeons use the docking technique for UCLR whereas 20% use the modified Jobe technique. Nineteen (63.3%) use palmaris longus autograft in UCLR. Overall, 28 (93.3%) do not routinely perform elbow arthroscopy or perform an obligatory transposition of the ulnar nerve

in patients without preoperative ulnar nerve symptoms. Twenty-eight (93.3%) would repair a type II SLAP tear, whereas only 1 (3.3%) would debride the tear. No surgeon would perform a concomitant biceps tenodesis, either open or arthroscopic

Effect of Additional Sutures per Suture Anchor in Arthroscopic Bankart Repair: A Review of Single-loaded Versus Double-loaded Suture Anchors.

Chen JS, Novikov D, Kaplan DJ and Meislin RJ. *Arthroscopy*, 32(7): 1415-1420.

To directly compare single-loaded suture anchors (SSA) with double-loaded suture anchors (DSA) to help surgeons optimize the operative technique, time, and cost of Bankart repairs.

A total of two studies were included, both of which were cadaveric laboratory studies. A total of 28 shoulders were tested.

Conclusions: Based on limited cadaveric study, DSA are at least equivalent biomechanically to SSA, and may be superior. By using DSA, surgeons create repair constructs that are as strong as, or stronger than, those made with SSA, but with fewer anchors. This reduces the amount of holes drilled and implants placed in the glenoid, while also minimizing cost.

Journal of Shoulder and Elbow Surgery Review

Causes of poor postoperative improvement after reverse total shoulder arthroplasty.

Werner BC, Wong AC, Mahony GT, Craig EV, Dines DM, Warren RF, Gulotta LV.

J Shoulder Elbow Surg. 2016

Aug;25(8):e217-222.

The study evaluated reverse shoulder arthroplasty(RSA), presenting at least 2-year follow up, using ASES score and its relationship with patient risk factors.

150 shoulders were assessed.

Improvements in ASES score were poorer in patients presenting the following characteristics: Male sex, intact rotator cuff at the time of surgery(these maybe associated to higher baseline ASES), depression and higher number of comorbidities.

Factors such as patient age and indication for surgery were not found to correlate with poor improvement after RTSA.

A new posterior triceps approach for total elbow arthroplasty in patients with osteoarthritis secondary to fracture: preliminary clinical experience.

Celli A. *J Shoulder Elbow Surg.* 2016

Aug;25(8):e223-231

The present study presents an alternative posterior elbow approach for elbow arthroplasty(EA) minimizing damage risks to the extensor mechanism.

It uses the lateral anconeus-triceps lateral flap approach, which preserves the olecranon insertion of the medial portion of the triceps proper tendon.

The analysis was carried out by using 20 patients, 2 years minimal follow up.

Mayo Elbow Performance Score rose from 41.3 to 94.3. The mean pain score on the visual analog scale fell from 7.1 to 1.1. There were no patients with insufficiency, secondary detachment of the triceps tendon. These preliminary data suggest that preservation of the insertion of the medial portion of the triceps proper tendon enables earlier active rehabilitation.

Irreducible anteromedial radial head dislocation caused by the brachialis tendon: a case report

Cates RA, Steinmann SP and Adams JE.

J Shoulder Elbow Surg. 2016

Aug;25(8):e232-235

This paper is a case report about a rare condition, the Anteromedial radial head dislocations. These dislocations often occur in the setting of trauma and are associated with fractures and ligamentous injuries. The open reduction is required when Soft tissue interposition occur, leading to an irreducible radial head. Several structures have been reported to be interposed in the radiocapitellar joint in those cases, including the annular ligament, anterior capsule, biceps tendon, and brachialis tendon. This paper presents a case of an irreducible anterior radial head subluxation caused by the brachialis tendon, and demonstrates in a cadaver dissection, that both the biceps tendon and the superficial tendon of the brachialis can lead to an anteromedial radial head dislocation or subluxation

Drug eruption secondary to vancomycin-laden spacer in the shoulder: a case report

Xu S, Ponce BA, Pavlidakey PG and Brabston EW III

J Shoulder Elbow Surg. 2016

Aug;25(8):e236-240.

The article describes the case of a 69-year-old, 78 Kg male patient with skin eruption caused by the parenteral use of vancomycin, associated with shoulder spacer using the same antibiotics. The case reports a post-operative shoulder arthroplasty infection by reverse prosthesis that evolved into an infection identified as p.acnes. The patient was treated with the withdrawal of the prosthesis, infusion of vancomycin and the use of a spacer.

The patient evolved with evident clinical signs of fever, pustule and eruptions. He underwent the withdrawal of the spacer and the substitution for vancomycin and gentamicin showing fast clinic improvement. The conclusion is that drug eruption can occur after both systemic and local diffusion from antibiotic-laden cement spacers.

Rotator cuff tear and sarcopenia: are these related?

J Shoulder Elbow Surg. 2016

Sep;25(9):e249-255.

Chung SW, Yoon JP, Oh KS, Kim HS, Kim YG, Lee HG et al

Sarcopenia is the loss of muscle mass and consequent loss of muscle function with aging. We evaluated (1) the difference in the prevalence of sarcopenia between patients with rotator cuff tear and controls and (2) the sarcopenia severity according to the size of the rotator cuff tear. Group 1 included 48 consecutive patients with chronic symptomatic full-thickness rotator cuff tears (mean age, 60.1 ± 6.5 years; range, 46-76 years), and group 2 included 48 age- and sex-matched patients. The sarcopenic index was evaluated by using the grip strength of the asymptomatic contralateral side and the skeletal muscle mass. The sarcopenic index was significantly inferior in the rotator cuff tear group than in the age- and sex-matched control groups. The results showed that sarcopenia was more severe in patients with a chronic symptomatic full-thickness rotator

cuff tear than in the age- and sex-matched control population and was correlated with the size of the tear.

Short-term outcomes after arthroscopic capsular release for adhesive capsulitis

[Barnes CP, Lam PH and Murrell GA.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):e256-264.

Little is known about the short-term temporal outcomes of an arthroscopic capsular release for adhesive capsulitis. The study included 140 shoulders in 133 patients with idiopathic adhesive capsulitis who underwent a complete arthroscopic release of the shoulder capsule. Patient-reported pain and shoulder function were evaluated with the use of Likert scales, and an independent examiner assessed shoulder strength and range of motion preoperatively and at 1 week, 6 weeks, 12 weeks, and 24 weeks postoperatively. Arthroscopic capsular release resulted in immediate improvements in pain, functional outcomes, and range of motion. Passive range of shoulder motion improved at 1 week, deteriorated slightly at 6 weeks, and then continued to improve at 12 and 24 weeks. Before surgery, 38% of patients reported extreme pain. This proportion reduced to 30% at 1 week postoperatively and 2% at 24 weeks postoperatively. Patients who underwent an arthroscopic capsular release for idiopathic adhesive capsulitis experienced significant reductions in pain, improvements in range of motion, and improvements in overall shoulder function in the first postoperative week and continue to improve at 6, 12, and 24 weeks postoperatively.

Recovery of active external rotation and elevation in young active men with irreparable posterosuperior rotator cuff tear using arthroscopically assisted latissimus dorsi transfer

[Petriccioli D, Bertone C and Marchi G.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):e265-275.

Massive irreparable posterosuperior rotator cuff tears represent a serious functional disablement for young and active patients in their daily activities. Latissimus dorsi (LD) muscle-tendon transfer can restore elevation and external rotation where supraspinatus

and infraspinatus function is lost. Between 2009 and 2013, 33 patients participate in this retrospective study. For 8 patients, we used a standard passage of the LD through the plane between the infraspinatus-teres minor and the deltoid muscles. For 25 patients, we transferred the LD tendon in front of the triceps muscle according to a personal described technique. The follow-up period was 35.7 months. Final follow-up included assessment by standard radiographs, bipolar surface electromyography, pain score by visual analog scale, Constant-Murley shoulder score, and Disabilities of the Arm, Shoulder, and Hand score. For quantitative strength evaluation measurements, a dynamometer was used. Arthroscopic LD tendon transfer for irreparable posterosuperior rotator cuff tears can achieve good clinical outcomes at a midterm follow-up, especially in active men 60 years of age or younger and in patients with low preoperative elevation ($<80^\circ$) but an intact or reparable subscapularis tendon

Is radiographic measurement of acromiohumeral distance on anteroposterior view after reverse shoulder arthroplasty reliable?

[Werner BS, Jacquot A, Molé D and Walch G](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):e276-280.

This study evaluated the reliability of the acromiohumeral distance in determining arm lengthening, resulting from a reverse shoulder arthroplasty. Forty four patients with a minimum 6 months follow up followed, a standardized protocol including preoperative and postoperative radiographs on anteroposterior view in neutral rotation, measured independently in random order by 2 orthopedic surgeons. The average lengthening was 2.5 cm, with significant differences in interobserver and intraobserver variability ($P < .01$). The mean inpatient difference was 0.5 cm. The study concluded that the acromiohumeral distance is not a reliable measurement technique to determine arm lengthening after reverse shoulder arthroplasty.

Intra-aortic migration of a Kirschner pin: hybrid surgical repair

[Tesson P, Ammi M, Ghomri D, Daligault M,](#)

[Péret M and Picquet J.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):e281-283.

An 85-year-old-woman was treated for recurrent shoulder dislocation by a glenohumeral stabilization with 2 Kirschner pins. At day 30, an X-ray showed that one of the pins suffered intra-aortic migration, without any cardiorespiratory symptom. For extraction of the pin, hybrid surgery was performed, with an uneventful postoperative course. Shoulder movement associated to bone resorption can explain the intrathoracic migration of the pins. Then, pulmonary movements and the pin's weight made it progress to a mediastinal position. Dementia also facilitates such migration, leading to the difficulties of immobilization. To avoid similar recurrent events, we propose a bending or a collar lock to secure the pin at the skin. However, there still remains a risk of breakage and migration of the medial segment. The learning point of this case is that these orthopedic devices should be used with consideration, particularly for patients who would not be able to respect the immobilization.

The yield of subsequent radiographs during nonoperative treatment of radial head and neck fractures

[Burton KR, Mellema JJ, Menendez ME,](#)

[Ring D and Chen NC1.](#)

J Shoulder Elbow Surg. 2016

Aug;25(8):1216-1222.

This study, considering radial head or neck fractures selected to nonoperative treatment, evaluated formerly, the null hypothesis that there are no patient, surgeon or injury factors associated with alteration in patient management based on subsequent radiographs and then the null hypothesis that the use of subsequent radiographs is not associated with patient, surgeon, and fracture characteristics. During 2013 and 2014, 415 adult patients with nonoperative radial head or neck fractures (Broberg and Morrey modified Mason type 1 or 2) were analyzed through bivariate and multivariable logistic regression modeling. Displaced fractures, in multivariable analysis, were more often to have subsequent radiographs, but surgeon-to-surgeon variation was the more influential

factor. After the diagnosis, subsequent radiographs did not alter treatment of these fractures.

This paper suggests the necessity for quality improvement initiatives among orthopedic surgeons.

The morphologic change of the ulnar collateral ligament of elbow in high school baseball pitchers, with and without symptoms, by sonography

Tajika T, Yamamoto A, Oya N, Ichinose T, Shimoyama D, Sasaki T et al
J Shoulder Elbow Surg. 2016 Aug;25(8):1223-1228.

In this study, ultrasonography (US) was used to assess the ulnohumeral joint space width, with and without valgus stress, to evaluate changes of the ulnar collateral ligament (UCL) in a group of high school pitcher's elbows, with and without elbow symptoms. US of the medial aspect of both elbows were obtained, with and without a valgus stress, being the elbows at 30° of flexion. Still, a questionnaire related to the pitching performance and elbow joint pain during the prior 3 years was applied to 122 high school baseball pitchers. Pitchers with elbow symptoms showed difference between the UCL thickness on the throwing side, when compared with asymptomatic patients ($P=.0013$). This morphologic change might reflect an early pathological finding in pitching.

Factors associated with adverse events after distal biceps tendon repair or reconstruction.

Beks RB, Claessen FMAP, Oh LS, Ring D and Chen NC

J Shoulder Elbow Surg. 2016 Aug;25(8):1229-1234.

Between January 2002 and March 2015, 373 adult patients who underwent repair or reconstruction of a distal biceps tendon tear were analyzed about factors associated with adverse events after their surgery. In the end, 82 patients (22%) had an adverse event (the most common one was lateral antebrachial cutaneous nerve neurapraxia); 5,3% were major adverse events; single-incision and obesity were associated to a higher rate of adverse events. 15 patients (18% of patients with an adverse event; 4% of all patients) had a second surgery after index distal

biceps surgery. Based on this study, authors suggest that patients should be advised that 1 in 5 patients will have a minor adverse event and 1 in 20 patients will have a major complication after repair or reconstruction of a distal biceps tendon tear.

Press-fit bipolar radial head arthroplasty, midterm results

Kodde IF, Heijink A, Kaas L, Mulder PGH, Dijk N and Eygendaal D
J Shoulder Elbow Surg. 2016 Aug;25(8):1235-1242.

The advantages of a bipolar radial head prosthesis compared with a monopolar one are: better radiocapitellar alignment accommodation, less capitellar abrasion and less occurrence of "stress shielding" over the bone-implant interfaces. Twenty seven out of 30 patients treated with a press-fit bipolar radial head arthroplasty were evaluated in this study. The mean follow-up was 48 months (28-73); a revision surgery had to be performed in 3 cases (2 capitellar abrasions and 1 prosthesis instability); in all such revisions, the stems appeared to be well fixed. The average flexion-extension final ROM was 136° (120°-145°); pronation-supination final ROM was 138° (70°-180°). According to the Mayo Elbow Performance Score, excellent and good results were obtained in 70% of the included patients. Authors end concluding that a press-fit bipolar radial head prosthesis shall be considered in the treatment of acute comminuted radial head fractures.

Application of the suture bridge method to olecranon fractures with a poor soft-tissue envelope around the elbow:

Modification of the Cha-Bateman methods for elderly populations

Cha SM, Shin HDAE and Lee JW
J Shoulder Elbow Surg. 2016 Aug;25(8):1243-1250.

The Cha-Bateman transosseous modified technique can be used for Mayo's types IIA or IIIA olecranon fractures in elder patients with osteoporotic bone and poor soft-tissue envelope. This technique is based on tension-band and suture-bridge methods using high-strength braided sutures and two anchors to enhance healing process and mechanical strength without the need of future hardware removal. Series of 13

fractures in patients with mean age of 69.7 years and at least one comorbidity showed union and excellent functional outcomes.

Selected anteromedial coronoid fractures can be treated nonoperatively

Chan K, Faber K, King G and Athwal G
J Shoulder Elbow Surg. 2016 Aug;25(8):1251-1257.

Nonoperative treatment of anteromedial coronoid fractures subtype 2 of O'Driscoll's classification (rim and tip) may be considered for patients that meet all the following criteria: (1) fragment size ≤ 5 mm, (2) minimally displaced (≤ 3 mm), (3) concentrically reduced elbow joint seen on both plain radiographs and CT, (4) stable elbow range of movement to a minimum of 30° of extension, and (5) normal findings on hyperpronation and gravity varus stress testing. Series of 10 cases treated nonoperatively with mean follow-up of 50 months showed consolidation with excellent functional outcomes. However, treatment success depends on patient compliance with the splinting and supervised exercises protocol and be available for serial follow-up monitoring.

Long-term results after a free vascularized adipofascial graft for congenital proximal radioulnar synostosis with an average follow-up of 10 years: a series of four cases

Kanaya K, Iba K and Yamashita T
J Shoulder Elbow Surg. 2016 Aug;25(8):1258-1267.

A free vascularized adipofascial graft interposition with radial osteotomy (Kanaya surgery) for congenital proximal radioulnar synostosis is a unique procedure for children, providing long-lasting rotational motion of the forearm and satisfactory functional outcomes. A 10-year follow-up analysis of 6 forearms in 4 patients treated with this technique demonstrated no recurrence rate. Extension, flexion and pronation range of movement achieved postoperatively persisted throughout follow-up. However, supination decreased by a mean of 16° from 1 year postoperatively to the final follow-up and it must be kept in mind when indicating this procedure together with other possible complications like radio head hypertrophy, epiphyseal

arrest, flap congestion and transient radial nerve palsy.

Anatomic cadaveric study of the extensile extensor digitorum communis splitting approach for exposing the ulnar coronoid process

Sukegawa K, Suzuki T, Ogawa Y, Ueno K, Kiuchi H et al.

J Shoulder Elbow Surg. 2016

Aug;25(8):1268-1273.

The extensile extensor digitorum communis (EDC) splitting approach provides sufficient exposure to the coronoid process. It may be clinically applied to cases of complex elbow instability centering on the lateral components and coronoid process fractures. Dissection of 20 fresh frozen cadaveric upper limbs at 70° of elbow flexion showed an average distance of 10mm between the most distal site of the EDC splitting and the posterior interosseous nerve, indicating that the splitting must be carefully performed and not extended longer than 40mm distally to the lateral epicondyle.

Long-term results after a free vascularized adipofascial graft for congenital proximal radioulnar synostosis with an average follow-up of 10 years: a series of four cases

The effect of myofibroblasts and corticosteroid injections in adhesive capsulitis.

[Hettich CM, DiCarlo EF, Faryniarz D, Vadasdi KB, Williams R and Hannafin JA.](#)

J Shoulder Elbow Surg. 2016

Aug;25(8):1274-1279.

Adhesive capsulitis is a condition that results in restricted glenohumeral motion. Fibroblasts has been implicated in the disease process; however, their role is not well understood.

In this paper, The authors hypothesized that myofibroblast prevalence in capsular biopsy specimens from patients with adhesive capsulitis would be increased compared with controls and that patients treated with an intra-articular injection of corticosteroid would have fewer myofibroblasts. The study prospectively enrolled 20 consecutive patients with adhesive capsulitis scheduled for capsular release and matched

controls. Tissue samples were collected from the posterior and anterior capsule for histomorphologic and immunohistologic analyses. Identical sectioning and preparation was performed in 14 additional adhesive capsulitis specimens from patients who had not received corticosteroid injections. Results confirmed that Patients with adhesive capsulitis not treated with preoperative corticosteroid demonstrated more histologic evidence of fibromatosis, synovial hyperplasia, and an increase in positive staining for α -smooth muscle actin. The paper concludes that Intra-articular steroid injection decreases the presence and amount of fibromatosis, vascular hyperplasia, fibrosis, and the presence of fibroblasts staining for α -smooth muscle actin. This supports the use of steroid injections to alter the disease process by decreasing the pathologic changes found in the capsular tissue.

Delayed administration of recombinant human parathyroid hormone improves early biomechanical strength in a rat rotator cuff repair model

[Duchman KR, Goetz JE, Uribe BU, Amendola AM, Barber JA, Malandra AE et al](#)

J Shoulder Elbow Surg. 2016

Aug;25(8):1280-1287

In this paper the authors hypothesized that administration of rhPTH beginning on postoperative day 7 would result in improved early load to failure after acute rotator cuff repair in an established rat model. Recombinant human parathyroid hormone (rhPTH) has been shown to improve healing at the tendon-to-bone interface in an established acute rat rotator cuff repair model,

They made 108 acute rotator cuff repairs in male Sprague-Dawley rats. Fifty-four rats received daily injections of rhPTH beginning on postoperative day 7 until euthanasia or a maximum of 12 weeks postoperatively. The remaining 54 rats received no injections and served as the control group. Animals were euthanized at 2 and 16 weeks postoperatively and evaluated by gross inspection, biomechanical testing, and histologic analysis.

At 2 weeks postoperatively, rats treated with

rhPTH demonstrated significantly higher load to failure than controls. No difference in load to failure was found between the 2 groups at 16 weeks postoperatively, blood vessel density appeared equivalent between the 2 groups at both time points, but increased intracellular and extracellular vascular endothelial growth factor expression was noted in the rhPTH-treated group at 2 weeks.

Delayed daily administration of rhPTH resulted in increased early load to failure and equivalent blood vessel density in an acute rotator cuff repair model.

They believe that the early improvement in biomechanical properties of the repaired rotator cuff after administration of rhPTH has some promise considering the relatively high reported rate of mechanical failure of rotator cuff repairs in humans without biologic augmentation, and that the results of their study warrant further investigation of both the biomechanical and histologic effects of rhPTH on rotator cuff healing while considering the optimal dose and duration of rhPTH administration.

Fatigue failure of reverse shoulder humeral tray components of a single design

[Lewicki KA, Martin AJ, Bell JE and Van Citters DW.](#)

J Shoulder Elbow Surg. 2016

Aug;25(8):1288-1296.

This Study aimed to determine the impact on geometry and materials used for modular humeral trays from a single manufacturer. Modularity in shoulder arthroplasty provides surgical flexibility and facilitates less complex revision surgery. Modular designs must fit in the glenohumeral joint space, necessitating minimal thickness and careful material selection. The potential for fatigue fracture is higher, and fatigue fracture has been experienced by patients. They retrieved 8 humeral trays of nearly identical designs: 4 Ti-6Al-4V (Ti) and 4 CoCrMo (CoCr). Optical microscopy and scanning electron microscopy were used, along with metallurgical techniques. Finite element and fatigue analyses of the stresses at the humeral tray taper informed observation interpretation. Scanning electron microscopy showed cracking in 2 Ti trays and no evidence of

cracking in the CoCr components. A geometric difference in the CoCr devices resulted in a 25% decreased stress under simulated activities of daily living. The fatigue failure envelope ranged from 1000 to 1 million cycles for Ti and from 30,000 to >10 million cycles for CoCr. All Ti humeral trays retrievals fractured in vivo or were cracked at the taper fillet. No CoCr retrievals showed signs of cracking. Finite element and fatigue analyses predict a 10-fold lifetime increase for the CoCr devices compared with the Ti devices. The results showed that failure of a clinical lifetime is within the realistic spectrum for titanium components and is less likely for cobalt chrome components. Furthermore, cracks in titanium are more likely to propagate to a critical length, especially in a thin component such as the humeral tray. This study shows that fatigue failure is a concern for some reverse shoulder components and should be carefully considered when designing and testing prostheses.

The osseous morphology of nondegenerated shoulders shows no side-related differences in elderly patients: an analysis of 102 computed tomography scans

[Bockmann B, Soschynski S, Lechler P, Schwarting T, Debus F, Soca B et al](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1297-1302.

The aim of this study was to identify side-dependent differences in the osseous anatomy of the shoulder joint. A precise understanding of glenohumeral anatomy is required to optimize preoperative planning in shoulder joint arthroplasty, which is difficult in the presence of degenerative disease. In unilateral disease, the contralateral shoulder can be used as a representation of normal anatomy; however, intrasubject differences in shoulder morphology have not been investigated. A retrospective study of all patients aged >65 years who received whole body computed tomography at their trauma center from 2010 through 2014 was conducted. Right and left shoulder computed tomography scans were examined, and the following anatomic parameters were measured: humeral head

diameter in anteroposterior and axial views, glenoid diameter in anteroposterior and axial views, glenoid surface, scapula neck depth, neck-shaft angle, glenoid inclination, glenoid/head ratio, and glenoid version. Patients with inadequate scan quality, osseous lesions, pre-existing anatomic abnormality, or metallic implant at the shoulder region and significant osteoarthritis were excluded. Statistical analysis of CT scans from 102 individuals failed to reveal any significant difference between left and right shoulder joint anatomy. Limitations of this study include the inclusion of only Caucasian subjects; it would be useful to extrapolate the study to those of differing ethnic backgrounds. There are no significant side-dependent differences in the osseous anatomy of the glenohumeral joint. In cases in which severe monolateral glenohumeral degeneration limits anatomic assessment, measurement of the contralateral shoulder will provide a reliable representation of the patient's normal shoulder anatomy.

2013 Neer Award: predictors of failure of nonoperative treatment of chronic, symptomatic, full-thickness rotator cuff tears

[Dunn WR, Kuhn JE, Sanders R, An Q, Baumgarten KM, Bishop JY et al](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1303-1311.

Prospective, multi-center, cohort study for define the indication for rotator cuff repair from identifying the predictors of failure of nonoperative treatment, examining risk factors for failing the rehabilitation. Dependent variable was time of surgery; the independent variables were tear severity and baseline patient factors: age, activity level, body mass index, sex, clinical score, pain scale, education, handedness, comorbidities, symptom duration, strength, employment, smoking and patient expectations. From 433 patients with full-thickness cuff tears in MRI, only 87 patients underwent surgery, with 93-88% follow-up in 1-2 years. Median age was 62 years, 49% were female. Stronger predictors for surgery were: expectations regarding physical therapy ($p<0.0001$), higher activity level ($p=0.011$), and not smoking ($p=0.023$). The Authors also

concluded that patient symptoms and anatomic cuff features may not be the best features when deciding for surgery.

Does application of moderately concentrated platelet-rich plasma improve clinical and structural outcome after arthroscopic repair of medium-sized to large rotator cuff tear? A randomized controlled trial

[Pandey V, Bandi A, Madi S, Agarwal L, Acharya KK, Maddukuri S et al](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1312-1322.

This randomized study compares if Platelet-rich plasma (PRP) application after repair of degenerative postero superior medium/large cuff tears leads to superior structural and clinical outcome, especially after single-row repair. PRP group (52 patients) and control group (50 patients) were included for arthroscopic repair with a minimum follow-up of 2 years. Patients were evaluated with 4 different clinical scores and ultrasound to assess retear and vascularity pattern of the cuff. Clinical scores results were controversial, varying from lower, higher or equal for PRP, depending of the score in use. At 24 months, the re-tear difference was significantly lower in the PRP group, for large tears only. Doppler ultrasound examination showed significant vascularity in the PRP group repair site at 3 months postoperatively and in peribursal tissue until 12 months.

Gender differences in expectations and outcomes for total shoulder arthroplasty: a prospective cohort study.

[Jawa A, Dasti U, Brown A, Grannatt K and Miller S.](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1323-1327.

Andrew Jawa, Umer Dasti, Amy Brown, Kathryn Grannatt, Suzanne Miller Gender may have an impact on the expectations and outcomes of orthopedic procedures, and limited data suggest that women may have worse outcomes in total shoulder arthroplasty (TSA). The objective of this study is compare the expectations and post operative outcomes between men and women. A group of 63 patients with a minimum of 3 years follow-up, 36 men, 27

women, answered a preoperative survey and were measured post operatively with 2 clinical scores. The main expectation in men were related to exercise and sports (lower age average), while in women were maintain the daily routine and chores. The second biggest expectations were related to sleep quality in both genders. In general, the expectations were high. The clinical scores revealed an increase in scores after surgery, without difference between genders.

Predominance of the critical shoulder angle in the pathogenesis of degenerative diseases of the shoulder

[Blonna D, Giani A, Bellato E, Mattei L, Caló M, Rossi R et al.](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1328-1336.

Davide Blonna, Andrea Giani, Enrico Bellato, Lorenzo Mattei, Michel Caló, Roberto Rossi, Filippo Castoldi
As the Critical Shoulder Angle (CSA) may be one of the responsible for rotator cuff tears RCT and concentric osteoarthritis. This cohort study aim to assess the association of CSA wit RCT, excluding potential confounding factors. Group has 200 patients, divided as 40 with osteoarthritis, 40 with isolates supraespinatus tear, 40 with at least supraespinatus and infraespinatus tears, and 80 with no shoulder problem (control). Larger CSAs are associated with increased risk of symptomatic cuff tears, larger cuff tears, and the severity of eccentric osteoarthritis. Smaller angles increased the risk and severity of concentric symptomatic osteoarthritis. These associations remained significant even after removal of some of the potentially confounding variables.

Outcomes in the treatment of periprosthetic joint infection after shoulder arthroplasty: a systematic review.

[Nelson GN, Davis DE and Namdari S.](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1337-1345.

This systematic review synthesizes the available literature on shoulder periprosthetic joint infection, to quantify and compare treatment effectiveness. In April 2014, from 663 initial articles, 30 high quality articles were used. Principal bacteria

were *Propionibacterium acnes* (38,9%) followed by *Staphylococcus* sp. Principal risk factors were previous surgery, increased age, male gender, increased body mass index, and diabetes mellitus. Other data analyzed was: white blood cell count, erythrocyte sedimentation, and C-reactive protein. No difference was found in the success rates of 1-stage or 2-stage nor resection arthroplasty revision, all with a >90% success. As confounding variables may occur in retrospective patients, more direct comparisons of 1-stage and 2-stage treatment are needed, comparing cost, morbidity and functional outcomes.

Outcome of lower trapezius transfer to reconstruct massive irreparable posterior-superior rotator cuff tear

[Elhassan BT, Wagner ER and Werthel JD.](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1346-1353.

The authors describe the lower trapezius transfer technique, associated with the use of an Achilles tendon allograft, for the treatment of irreparable rotator cuff tears. 33 patients were included in this study, all of them presenting with advanced fatty degeneration (Goutallier III / IV) and irreparable postero-superior rotator cuff tears, retracted at the level of the glenoid in their respective MRIs. 2/3 of these patients had been previously operated for a rotator cuff repair, without success. The average age of these patients was 53 years old. The authors report good clinical results using this technique, with a minimum 02 years follow-up, with significant improvement in shoulder pain; in terms of shoulder function, improvements were best in external rotation, although shoulder elevation and abduction have also significantly increased, especially in those patients who had 60° (or more) of shoulder elevation, preoperatively. This study has evidence level IV.

Total shoulder arthroplasty using an inlay mini-glenoid component for glenoid deficiency: a 2-year follow-up of 9 shoulders in 7 patients

[Davis DE, Acevedo D, Williams A and Williams G.](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1354-1361.

The authors describe retrospectively the results and complications of the use of a "mini-glenoid" component in TSA (Total Shoulder Arthroplasty), in patients with dysplastic glenoids and in glenoids with significant bone loss. For each of the 09 shoulders involved in this study, a specific mini-glenoid component was "customized" from pre-operative tomographic 3D images. All surgeries were performed using a standard delto-pectoral approach, and the original glenoid retroversion was not changed during the operation. The authors report, in a 02 years follow-up, significant improvement in pain, and, clinically, in forward elevation and in external rotation. This technique, thus, can be an option in the management of a notoriously difficult situation - the use of glenoid components in dysplastic glenoids and in glenoids with significant bone loss.

Reverse shoulder arthroplasty with a cementless short metaphyseal humeral implant without a stem: clinical and radiologic outcomes in prospective 2- to 7-year follow-up study.

[Levy O, Narvani A, Hous N, Abraham R, Relwani J, Pradhan R et al](#)

J Shoulder Elbow Surg. 2016 Aug;25(8):1362-1370.

The authors describe their clinical and radiological results using a reverse prosthesis with a new kind of humeral component, without the presence of a stem. 98 shoulders were operated, with an average age of 74 years, and the humeral (stemless) component was always used without cement - authors fixed it in "press-fit" fashion into the proximal humerus, making the fixation, thus, more biological. The authors insist that the presence of osteoporosis is not a contraindication to the technique. Good clinical and radiological results were reported in a follow-up from 2 to 7 years. Still, the preservation of the proximal humerus bone stock in fact shall favor a possible surgical revision, in future.

Loose glenoid components in revision shoulder arthroplasty: is there an association with positive cultures?

[Lucas RM, Hsu JE, Whitney JJ, Wasserburger J and Matsen FA 3rd.](#)

J Shoulder Elbow Surg. 2016

Aug;25(8):1371-1375

In this study, the authors analyzed a series of 221 total shoulder arthroplasties that underwent surgical revision, to assess whether there would be a relationship between glenoid component loosening and positive intraoperative cultures. 2/3 of the patients had loosening of the glenoid component, while in 1/3 the glenoid component was still well fixed, and stable. None of these patients had clinical signs of infection. Intraoperative cultures revealed that, in patients with loosening of the glenoid component, 54% had positive cultures, while in patients with the glenoid component still well fixed, 51% had positive cultures. The authors end concluding that there must be a high suspicion of infection anytime a shoulder surgeon is facing a total shoulder arthroplasty revision.

Effect of surgeon-sonographer interaction on ultrasound diagnosis of rotator cuff tears: a five year cohort study in 775 shoulders.

[Kurz AZ, Kelly MJ, Hackett L and Murrell GA.](#)

J Shoulder Elbow Surg. 2016 Sep;25(9):1385-1394.

The study aims to determine whether the surgeon-sonographer interaction improves the accuracy at predicting rotator cuff injuries. It is a cohort study that assessed 775 shoulders.

The authors used three interactions between surgeon and ultrasonographer per patient – (1) within the surgeon's clinic, (2) at surgical center, (3) preoperatively and postoperative.

Variables assessed by presence of cuff injury and size of the cuff injury.

The authors divided the patients also into 5 groups, each one by assessment year. Sensitivity and specificity increased when compared to the group 5 with group 1, with variation from 93% to 99% in sensitivity, and 68% to 93% in specificity. There was an improvement in the correlation of the ability to estimate the size of rotator cuff tears from ultrasonography to surgery in both full- and partial-thickness tears.

Surgeon-ultrasonographer interaction can improve the diagnosis of rotator cuff injury particularly with respect to the overall accuracy.

Effects of two stretching methods on shoulder range of motion and muscle stiffness in baseball players with posterior shoulder tightness: a randomized controlled trial

[Yamauchi T, Hasegawa S, Nakamura M, Nishishita S, Yanase K, Fujita K et al](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1395-1403.

This study aims to evaluate the effects of 2 stretching methods, the modified cross-body stretch (MCS) and the modified sleeper stretch (MSS), on shoulder ROM and muscle stiffness in young baseball players with posterior shoulder tightness. These stretching methods were modified by Wilk from cross-body stretch and sleeper stretch.

The authors evaluated twenty-four college baseball players with ROM limitations in shoulder internal rotation. The baseball players were randomly assigned to the MCS or MSS group. They were asked to perform 3 repetitions of the stretching exercises every day, for 30 seconds, with their dominant shoulder.

The authors measured shoulder internal rotation and horizontal adduction ROM and assessed posterior shoulder muscle stiffness with ultrasonic shear wave elastography before and after a 4-week intervention.

Shoulder internal rotation and horizontal adduction ROM were significantly increased in both groups, but the stiffness of the teres minor decreased in the MCS group and the stiffness of the infraspinatus decreased in the MSS group.

These stretching techniques can be performed by players without the help of a therapist, which enables them to treat or to prevent posterior shoulder tightness.

This study demonstrated that the MCS and MSS are effective for increasing shoulder internal rotation and horizontal adduction ROM and decreasing muscle stiffness of the infraspinatus or teres minor, but to assess long-term results this study should continue.

The ultrasonographic evaluation with anatomical parameters and top rated member position may also represent a method of evaluation to be improved because of variables that can occur, but

clinical improvement should always be considered.

Length of stay after shoulder arthroplasty - the effect of an orthopedic specialty hospital

[Padegimas EM, Zmistowski BM, Clyde CT, Restrepo C, Abboud JA, Lazarus MD et al.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1404-1411.

This study assesses hospital length of stay (LOS) in patients that underwent to primary arthroplasty shoulder in 2 different hospital types: an orthopedic specialty hospitals (OSH) versus a tertiary referral center (TRC).

The authors evaluated the data of 136 patients of OSH and 1138 of TRC from January 1, 2013 to July 1, 2015. LOS and readmissions were assessed. The surgical procedures were performed by the same team of experts in shoulder surgery in both hospitals.

The patients evaluated in these hospitals presented balance in the baseline, making comparisons between hospitals very reliable.

The LOS of OSH was on average 1.31 days, while in TRC was 1.85 days on average, and the rehospitalization rate was similar among hospitals.

The authors demonstrate that LOS difference is relevant and that this is due to rapid rehabilitation and orthopedic protocols performed in OSH, believing that this decrease demand lower rates of infection and improved patient satisfaction with the procedure.

Surgical management of midshaft clavicle nonunions is associated with a higher rate of short-term complications compared with acute fractures.

[McKnight B, Heckmann N, Hill JR, Pannell WC, Mostofi A, Omid R et al](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1412-1417.

This study reports the perioperative complication rates after surgical management of nonunions versus acute fractures. The patient for this study were enrolled by using the American College of Surgeons National Surgical Quality Improvement Program database using Current Procedural Terminology to identify

patients between 2007 and 2013. The authors evaluated a total of 1215 patients, 1006 with midshaft clavicle fractures and 209 with midshaft nonunions. On multivariate analysis, Patients undergoing surgical fixation for nonunion had a higher rate of total complications compared with the acute fracture group with 5.26% vs. 2.28% in analysis for the first 30-day of postoperative clavicle's ORIF. This study concludes that the nonunion group presented increased risk of short-term complications comparing with acute fractures. The authors believe that study provides additional information to consider in making management decisions for these common injuries. Monitoring for longer periods and evaluation of the causes of midshaft clavicle nonunion can contribute to understand the complications found in this study and improve additional information for surgical decisions.

Younger patients report similar activity levels to older patients after reverse total shoulder arthroplasty

Walters JD, Barkoh K, Smith RA, Azar FM and Throckmorton TW
J Shoulder Elbow Surg. 2016 Sep;25(9):1418-1424.

The purpose of this study was to evaluate patient-reported activities after RTSA in two cohorts, patients younger than 65 years and patients older than 65 years at the time of surgery. 46 patients answered a visual analog score (VAS) for pain, patient reported range of motion, patient-reported strength on a scale from 1 to 10, narcotic use, and additional demographic data. The postoperative activity levels, pain, range of motion, strength, and number of activities were similar in patients of different age groups. Such findings are encouraging because RTSA has been shown to have better outcomes than hemiarthroplasty, the typical alternative in younger patients, despite its relatively high complication rate. Although it is logical to suggest that younger patients will place increased stress on RTSA implants, leading to premature implant failure, our data indicate that patients younger than 65 years did not perform more high-demand activities than their older

counterparts. Thus, the same wear rate could be expected in the 2 groups; however, even if wear rates are similar, the longer life expectancy of the younger cohort would still be expected to result in more overall prosthetic wear complications in the long term, and these data are not meant to be predictive of implant survival or revision rates.

Reverse total shoulder arthroplasty with structural bone grafting of large glenoid defects

Jones RB, Wright TW and Zuckerman JD
J Shoulder Elbow Surg. 2016 Sep;25(9):1425-1432.

Large structural grafts from the humeral head or iliac crest have been used to reconstruct posterior, superior, and anterior defects. More recently, extended pegged baseplates have been used to assist fixation to the native scapula. This study quantified the clinical outcomes and compared results using a structural allograft or autograft placed behind the glenoid baseplate to address large structural defects of the glenoid during RTSA.

Preoperative and postoperative data were analyzed from 44 patients (20 men and 24 women), with an average age of 69.1 ± 7.4 years, who received primary RTSA or revision RTSA requiring a structural bone graft behind the baseplate for a severe glenoid defect. The average follow-up was 40.6 ± 16 months. These patients were evaluated and scored preoperatively and at the latest follow-up using the ASES, Constant, simple shoulder test (SST), and shoulder pain and disability index (SPADI) scoring metrics. Daily pain, active abduction, forward flexion, and external rotation were also measured. RTSA presents a more favorable environment for graft incorporation compared with anatomic TSA. This is due to the ability to achieve graft compression and fixation with screws placed through the baseplate in conjunction with a long peg or cage into the native glenoid. Although the RTSA with bone graft does show significant improvements, these patients still do not reach the same level of improvement as those who do not require bone grafts. An autograft humeral head/iliac crest or allograft femoral head may be used during

RTSA to reconstruct large glenoid defects with no clinical difference between than in this report. Excellent clinical outcomes can be expected, as evidenced by improvements in postoperative function and clinical outcome measures 2 years postoperatively.

Quantitative diffusion-weighted magnetic resonance imaging for the diagnosis of

partial-thickness rotator cuff tears

Lo HC, Hung ST, Kuo DP, Chen YL and Lee HM. J Shoulder Elbow Surg. 2016 Sep;25(9):1433-1441.

This study investigated diffusion-weighted (DWI) magnetic resonance imaging (MRI) as an alternative to fat-suppressed T2-weighted imaging (FS-T2WI) for assessment of partial-thickness rotator cuff tears (RCTs). Patients with arthroscopy proven partial-thickness RCTs who also received MRI (FS-T2WI and DWI) before surgery were prospectively included.

Included were 146 patients, with a mean age of 48.3 years (range, 19-86 years), of whom 43 had full-thickness RCTs, 67 had partial-thickness RCTs, and 36 had no tears.

Two observers (H.C.L. and Y.L.C., with 20 and 5 years of musculoskeletal MRI experience, respectively) retrospectively and independently reviewed conventional FS-T2WI and combined DWI images. The observers were blind to the arthroscopy results and clinical diagnosis; the surgeons, however, had reviewed the MRI results before surgery. FS-T2WI and DWI images were interpreted at the same session because DWI was felt to provide better sensitivity and additional information regarding detection of partial-thickness RCTs when FS-T2WI and DWI images were interpreted at the same time. Images were analyzed in 2 sessions, 4 to 6 weeks apart.

They concluded that DWI is more accurate and sensitive than FS-T2WI for diagnosing partial-thickness RCTs and can distinguish them from full-thickness tears. Thus, DWI can be used as an alternative means of diagnosing partial-thickness tears when they are not easily differentiated using FS-T2WI.

Core decompression and arthroplasty outcomes for atraumatic osteonecrosis of the humeral head

Kennon JC, Smith JP and Crosby LA

J Shoulder Elbow Surg. 2016

Sep;25(9):1442-1448.

The objective of the study was to analyze the effectiveness of the treatment strategy used at the institution for patients with AVN. They attempted to stimulate angiogenesis and prevent humeral head collapse by combining standard core decompression with ultrasound bone stimulation in the treatment of stage I and II patients. This study used resurfacing as a treatment for stage III patients and arthroplasty for stage IV/V patients in an attempt to analyze the outcome and determine efficacy with these treatment modalities..

The study population represents etiology primarily due to CSI osteonecrosis or SCD. They documented radiographic progression and functional outcomes after procedures for HAAVN and determine efficacy of core decompression and arthroplasty treatments. Between 2009 and 2014, 25 shoulders (20 patients) were treated surgically for HAAVN at a single institution by a single surgeon and principal investigator (L.A.C.). The results suggest core decompression for early AVN in SCD patients does not alter the progression of osteonecrosis and progression to humeral head collapse, necessitating further surgical treatment. Patients who develop humeral head osteonecrosis secondary to SCD are at increased risk of progression when treated with core decompression during the early stages of the disease.

Based on their patient series, they would consider bypassing core decompression in favor of resurfacing and arthroplasty options, which may prove more beneficial. Resurfacing, hemiarthroplasty, TSA, and RTSA displayed favorable results across all risk factors. Using resurfacing or hemiarthroplasty for stage III and performing TSA or RTSA for stage IV/V disease is a viable treatment algorithm for improving clinical outcomes with stage III, IV, or V disease. The addition of ultrasound bone stimulation does not appear to add any beneficial aspects to the treatment of HAAVN.

Comparison of implant cost and surgical time in arthroscopic transosseous and transosseous equivalent rotator cuff

repair

Black EM, Austin LS, Narzikul A, Seidl AJ,

Martens K and Lazarus MD

[J Shoulder Elbow Surg. 2016](#)

[Sep;25\(9\):1449-1456.](#)

This study analyzed differences in implant costs and surgical time between 2 cohorts of patients—one undergoing arthroscopic transosseous equivalent (TOE) rotator cuff repair and other undergoing arthroscopic transosseous rotator cuff repair.

Operative time did not significantly differ between TOE and transosseous groups

However, there was a substantial increase within the TOE group in surgical time by upwards of 35 minutes between small and massive rotator cuff repairs (with a semilinear increase in the medium and large categories). In the transosseous group, this case time increase was less (9-16 minutes longer for massive tears compared with small and medium tears, respectively).

The overall cost of implants was significantly less in the arthroscopic transosseous repair by an average of \$336.05 ($P < .0001$). This cost difference was magnified with larger tear sizes—transosseous repair was \$153.25 less with small- sized tears, \$275.28 less with medium-sized tears, \$409.01 less with large-sized tears, and \$791.29 less for massive-sized tears.

We determined that implant costs are significantly lower in transosseous repair than in TOE repair, by an average of \$336.05 per case. In large and massive tears, this number was even higher (\$409.01 savings per case for large tears and \$791.29 for massive tears).

Arthroscopic transosseous rotator cuff repair can afford substantial cost savings compared with TOE repairs. This cost savings is magnified with increasing tear sizes.

Is the arthroscopic modified tension band suture technique suitable for all full-thickness rotator cuff tears?

Bae KH, Kim JW, Kim TK, Kweon SH,

Kang HJ, Kim JY et al

[J Shoulder Elbow Surg. 2016](#)

[Sep;25\(9\):1457-1463.](#)

The purpose of this study was therefore to explore whether the modified tension band suture technique, is appropriate for

arthroscopic repair of full-thickness rotator cuff tears of all sizes.

47 patients were enrolled in this study.

For tendon-to-bone repair, we used a modified tension band suture technique (a modified version of the tension band suture technique) and a knotless suture anchor.

Overall, the mean VAS score improved.

At the final follow-up, the clinical results showed significant improvements compared with those at the preoperative evaluations.

We found that clinical improvements were unsatisfactory and the retear rates were excessively high in the group with large to massive tears (69%) compared with those in the group with small to medium tears (6%). We suggest that the modified tension band suture technique, as described here, has more advantages than does a traditional tension band suture technique. By using a knotless suture anchor, the operating time was shortened.

Isokinetic shoulder strength correlates with level of sports participation and functional activity after reverse total shoulder arthroplasty

Wang A, Doyle T, Cunningham G, Bratty

M, Campbell P, Bharat C et al

[J Shoulder Elbow Surg. 2016](#)

[Sep;25\(9\):1464-1469.](#)

The aims of this study were to measure isokinetic strength after RTSA and to evaluate the correlation of various strength parameters on participation in sports and recreation and patient- reported outcome scores.

A retrospective study was performed of all patients having undergone RTSA during the period 2008 to 2013. RTSA was performed using the uncemented SMR Modular Shoulder System (Lima Corporate, Udine, Italy) in all cases.

The survey included 51 patients at a mean of 29.5 months (range, 12-60 months) after surgery. Mean age was 74.1 years. Patient-reported sporting activity was classified as low, medium, or high demand.

Reported sporting activity was high demand in 35% and moderate demand in 43%.

There was a large variation in shoulder isokinetic strength parameters especially for internal and external rotation.

In this study, 78% of subjects had returned to moderate- or high-grade recreational or

sporting activity in the short term after RTSA. This is a rate of participation similar to that reported in previously published patient surveys after RTSA as well as after anatomic TSA and hemiarthroplasty. In addition, our study reports a high level of patient satisfaction and clinical function with RTSA.

Increased isokinetic shoulder strength correlates with greater participation in sports and recreational activity after RTSA. The importance of internal rotation strength after RTSA has been highlighted by this study.

Shoulder arthroplasty for chondrolysis

Schoch B, Werthel JD, Cofield R, Sanchez-Sotelo J and Sperling JW
[J Shoulder Elbow Surg. 2016 Sep;25\(9\):1470-1476.](#)

Between January 2000 and January of 2013, 23 consecutive shoulders with chondrolysis were treated.

Shoulder arthroplasty significantly reduced pain.

Overall, 15 patients were satisfied, rating their shoulder as much better or somewhat better. Four patients rated their shoulder the same, and 4 reported being worse than before arthroplasty.

This is the largest series of shoulder arthroplasty for chondrolysis. The results of our study indicate that shoulder arthroplasty can be expected to provide pain relief and improved motion for patients with chondrolysis. However, outcome scores and subjective satisfaction are variable, with 35% of patients reporting that their shoulder is the same or worse than before surgery.

The high early rates of reoperation after shoulder arthroplasty for chondrolysis are significantly higher than those reported for TSA for the treatment of osteoarthritis in patients younger than 55 years.

The shoulder arthroplasty is a good option to give the pain relief. But the high revision rates (22%) and no satisfaction rates (35%) are concerns.

Prevalence of posterior elbow problems in Japanese high school baseball players

Kida Y, Morihara T, Furukawa R, Sukenari T, Kotoura Y, Yoshioka N et al
[J Shoulder Elbow Surg. 2016 Sep;25\(9\):1477-1484.](#)

Posterior elbow problems with pain are related to baseball player and the study aimed to determinate the prevalence and diagnoses associated and the post-treatment recovery time for returning to the sport. 576 Japanese high school baseball players were enrolled in the study. The elbow of each player's throwing arm was assessed by use of a questionnaire and physical examination. When problem detected, players visited the hospital and were initially treated conservatively and underwent surgery if necessary. Retrospectively, players with positive physical examination results associated with posterior elbow pain, defined as olecranon tenderness and/or a positive elbow extension impingement test, were selected. Those problems were found in 76 players (13.2%). Of these, 33 agreed to visit the hospital for further diagnostic imaging and 25 players (75.8%) were diagnosed with posteromedial elbow impingement. By the next spring, 87.9% of players returned to sport, and 100% of players returned to sport before the next summer. The average recovery period was 77 ± 47 days.

Articular shear injuries of the capitellum in adolescents

Frank JM, Saltzman BM, Garbis N and Cohen MS
[J Shoulder Elbow Surg. 2016 Sep;25\(9\):1485-1490.](#)

Fractures of the capitellum are rare and classified into 4 types in adolescents, being studied 3 type II cases, that involves a shear injury with a mostly articular cartilage component and little subchondral bone, so the diagnoses can be difficult in the immature skeleton. Those cases were treated conservatively by misdiagnosing and rapidly developed radiocapitellar arthrosis. They were then operated with a postoperative follow up of 49 months with good results, but one of them needed 2 subsequent operations, despite the fact that all of them demonstrated advanced degenerative changes on imaging. Results demonstrates that by the unknown long term prognosis, better imaging and a high index of suspicion is necessary and maybe a early intervention might have altered the outcome for these patients.

Interosseous membrane reconstruction with a suture-button construct for treatment of chronic forearm instability

Gaspar MP, Kane PM, Pflug EM, Jacoby SM, Osterman AL and Randall Culp RW
[J Shoulder Elbow Surg. 2016 Sep;25\(9\):1491-1500.](#)

This study reports outcomes of interosseous membrane (IOM) reconstruction with a suture-button construct for treatment of chronic longitudinal forearm instability, by a retrospective review with prospective follow-up of patients who underwent ulnar shortening osteotomy and IOM reconstruction. Preoperative and postoperative were compared with QuickDASH score, range of motion, grip strength and ulnar variance. Ten patients were included, 8 post-traumatic sequelae of Essex-Lopresti-type injuries, 1 forearm instability secondary to previous elbow surgery, and 1 instability secondary to trauma and multiple elbow surgeries. Surgeries were performed an average of 28.6 months from injury with a mean follow-up of 34.6 months. Significant improvement in elbow and wrist flexion-extension arc, Quick DASH score and ulnar variance was observed. Three patients underwent for an additional surgery, but it concluded that IOM reconstruction using a suture-button construct is an effective treatment option for chronic forearm instability.

Inhibition of p38 mitogen-activated protein kinase signaling reduces fibrosis and lipid accumulation after rotator cuff repair

Wilde JM
[J Shoulder Elbow Surg. 2016 Sep;25\(9\):1501-1508.](#)

Because there are no known pharmacologic treatments available to effectively prevent degeneration or cause regeneration of torn rotator cuff muscles after repair, using a preclinical rat model of rotator cuff injuries, we sought to determine the ability of a small molecule inhibitor of p38 MAPK, SB203580, to reduce muscle tissue damage from inflammation, fatty degeneration, and muscle atrophy after rotator cuff repair. Adult rats underwent a bilateral supraspinatus tenotomy that was repaired 30 days later. Rats were treated with SB203580 or vehicle every 2 days, with

injections beginning 3 days before surgery and continuing until 7 days after surgery. Two weeks after surgical repair, muscles were analyzed using histology, lipid profiling, gene expression, and permeabilized muscle fiber contractility. In this study, inhibition of p38 MAPK at the time of rotator cuff repair resulted in a clinically favorable decrease in lipid accumulation, which is a hallmark in the rotator cuff degenerative cascade and predictive of clinical outcomes. Inhibition of p38 MAPK was also effective at reducing collagen content and inflammatory biomarkers. In addition, we found that it is possible to markedly reduce fat accumulation and fibrosis without affecting muscle fiber force production.

Fracture Mapping of Displaced Partial articular Fratures of the Radial Head.

Mellena JJ and Eygendaal D

J Shoulder Elbow Surg. 2016

Sep;25(9):1509-1516.

We tested the null hypothesis that there is no difference in fracture line distribution and location of displaced partial articular radial head fractures between specific patterns of traumatic elbow instability. Fracture line distribution and location of 66 acute displaced partial articular radial head fractures were identified using quantitative 3D computed tomography reconstructions that allowed reduction of fracture fragments and a standardized method to divide the radial head into quadrants with forearm in neutral position. Based on qualitative and quantitative assessment of fracture maps, the association between fracture characteristics of displaced partial articular radial head fractures and specific elbow fracture patterns was determined. Most fracture lines entered the posterolateral quadrant and exited the radial head through the anterior quadrants (77% and 98%, respectively) and parts of the posteromedial quadrant were involved in a minority of the fractures (15%). The highest fracture line intensity was located in the anterolateral quadrant near the center of the radial head, indicating that most fracture lines pass through the radial head through the anterolateral quadrant slightly anterolateral to the center of the radial head.

This suggests a common mechanism of radial head fractures. Furthermore, we demonstrated that the radial head fracture location did not differ between the fracture patterns of the elbow. Thus our fracture maps demonstrated no association between fracture line distribution and location of displaced partial articular fractures of the radial head and specific patterns of traumatic elbow instability, suggesting one common fracture mechanism that involves the anterolateral part of the radial head in most patients.

Joint capsule attachment to the coronoid process of the ulna: an anatomic study with implications regarding the type 1 fractures of the coronoid process of the O'Driscoll classification.

[Shimura H, Nimura A, Nasu H, Fujishiro H, Imatani J, Okawa A et al](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1517-1522.

This is an anatomic study using embalmed cadavers. We used 17 arms (8 right and 9 left) from embalmed cadavers. The relationship between the joint capsule attachment and the coronoid process was examined macroscopically and microscopically.

The length of the capsule attachment at the radial side of the coronoid (11.9mm) was greater than that at the ulnar side (6.1 mm). The bone thickness on the coronoid tip from the proximal edge of the joint capsule attachment was 1.9 mm; together, the cartilage and bone thickness was 4.7 mm. At the radial side of the coronoid, the thickness of the joint capsule at the proximal aspect of the attachment of 2 samples was 0.6 mm and 0.3 mm, and that at the tip of the coronoid was 2.6 mm and 1.7 mm, respectively. Based on this result, the classification between subtypes 1 and 2 of coronoid tip fractures with the O'Driscoll classification could be proved to be anatomically meaningful because it distinguishes the inclusion of the capsule attachment implying on a much larger fragment including joint cartilage and the attachment of the anterior capsule.

Comparison of shoulder internal rotation passive range of motion in various positions in nonathletic persons

and the establishment of normative values for the side lying position

[Cierninski CJ, Kelly SM, Nawrocki TJ, Indrelie AJ, Klaers H and Stelzmler MR.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1523-1531.

To determine shoulder internal rotation (IR) range of motion (ROM) in three different positions (sidelying, semi-side lying and supine) and establish normative values for IR ROM in this positions, 204 nonathletic persons were evaluated. The sidelying IR showed the highest level of intra-rater and inter-rater reliability among positions analysed. Sidelying IR ROM was 47.1° for dominant side and 53.9° for nondominant shoulder, which were significantly smaller than values on semi-sidelying (56.9° / 62.1°) and supine (57.4° / 63.3°).

It was suggested that sidelying position limits the anterior tilt of scapula reducing IR. Men showed less IR ROM when compared to women for all 3 positions. IR ROM decreases with aging on both dominant and nondominant shoulders.

An anthropometric analysis to derive formulae for calculating the dimensions of anatomically shaped humeral heads

[Humphrey CS, Sears BW and Curtin MJ.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1532-1541.

For the 79 humeral heads used, the average difference between D(diameter)F(frontal plane) and DS(sagittal plane) measurements at the base of the head was 4.3 mm but the average difference clearly increased in value as humeral head size increased. The elongation of the elliptical shape of the head base that occurs with increasing head size may be demonstrated by the evidence that DS lengthens at a slower rate than DF as head size increases and also because results show that if the difference between DF and DS is plotted relative to the length of DF results show that the value of (DF – DS) increases as the head size increases. To substantiate these linear regression analysis results, they compared (DF – DS) values between small, medium, and large head sizes. They conclude that on average, small humeral heads are closer to being spherically shaped, whereas with larger humeral heads, the elliptical shape at the

base of the head is typically more elongated. It was observed that females have smaller humeral heads in general than males, but the dimensional changes that occur with increasing head size appear to happen predictably and proportionally for both males and females.

This is the first study to report that on average the elliptical shape of the base of the humeral head elongates with increasing humeral head size; the biomechanical and clinical implications of this phenomenon are not yet well understood. The methods and findings of this study may have implications for future prosthetic shoulder design in which the goal is to replicate normal anatomy.

Distal tibia allograft for glenohumeral instability: does radius of curvature match?

[Decker](#)

[MM, Strohmeier GC, Wood JP, Hatch GM, Qualls CR, Treme GP et al](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1542-1548.

This study evaluated radius of curvature (ROC) as the glenoid mismatch as measured on CT scans between the glenoid, distal tibia, and humeral head. Bilateral CT images were formatted giving 20 specimens per anatomic location. The mean \pm standard

deviation ROC was 2.9 ± 0.25 cm for the glenoid, 2.3 ± 0.21 cm for the distal tibia, and 2.5 ± 0.12 cm for the humeral head. The most significant finding in our study was that when a distal tibia was randomly assigned to a given glenoid, the mean difference between the distal tibia and the glenoid ROC was 0.55 ± 0.31 cm. Only 22% of randomly paired distal tibias and glenoids had a difference in ROC of 0.3 cm or less. CT measurement of the ROC of the glenoid, distal tibia, and humeral head is reliable and reproducible. The probability of obtaining a random distal tibia allograft with a similar ROC to the glenoid is low. Obtaining ROC measurements of the injured glenoid and the distal tibia allograft specimen before use for glenoid reconstruction may be useful.

Redislocation risk after an arthroscopic Bankart procedure in collision athletes: a systematic review

[Alkaduhimi H, van der Linde JA,](#)

[Willigenburg NW, Paulino Pereira NR, van Deurzen DF and van den Bekerom MP.](#)

J Shoulder Elbow Surg. 2016

Sep;25(9):1549-1558.

The purpose of this review was to determine the redislocation risk for collision athletes after an arthroscopic Bankart repair

and to compare the redislocation rate between collision athletes and noncollision athletes after an arthroscopic Bankart repair. Screening all relevant literature of arthroscopic Bankart procedures mentioning redislocation rates in collision athletes. There were 1012 studies screened and finally 20 studies were included. Fourteen studies reported increased redislocation rates for collision athletes in comparison to noncollision athletes (absolute risk difference varying from 0.4% to 28.6%), whereas 2 studies reported decreased rates (absolute risk differences of -6% and -2.4%). A combined analysis revealed that collision athletes have an increased absolute risk from 3.61 to 12.57% for development of postoperative instability in comparison to noncollision athletes ($P = .001$). Collision athletes have an increased risk for redislocation in comparison to noncollision athletes after an arthroscopic Bankart repair, although there were no differences in return for sport.

Conflict of Interest: NIL
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