depending on the size of the Hill Sachs lesion. Patients completed the ASES, Miss, WOSI, DASH, Rowe, Constant, and VR-12 patient-reported outcomes scores at final follow-up. Patients were asked to score their satisfaction with the outcome of their surgery on a scale of 1 (unsatisfied) to 10 (very satisfied). A sense of apprehension or a subluxation event was categorized as a failure and a dislocation event was categorized as a reinjury. Plain radiographs were independently reviewed for glenohumeral joint space decrease from preoperative films. The presence of OA, failure, and loss of motion were recorded in both groups. Patients were divided into 2 groups by age (<25 years old vs ≥25 years old) for analysis. Results: There were 26 patients in the younger, high risk group (<25 years) and 28 patients in the older patient group (≥25 years of age). The younger group were all males that participated in moderate to vigorous sports as categorized by American College of Sports Medicine, and 88% had traumatic dislocation prior to surgery. There were 2 (3.7%) failures requiring revision surgery and 3 (5.6%) reinjuries requiring surgery. All revisions were in male patients, who participated in high-risk sports (baseball, hockey, sailing). At mean 13-year follow-up, all patients in the younger, high risk age group and the older age group returned to sport activities. All patients in the younger, high risk group returned and only 71% (21/28) of patients the older group returned to sport activities at an equal level as prior to injury (p=0.014). No evidence of glenohumeral narrowing was noted on plain radiographs. No differences were seen in outcome scores between the cohorts at follow-up. Conclusion: We report excellent results in both young, high risk and older patients following arthroscopic labral reconstruction with a modified capsular shift at mean 13-year follow-up. The addition of glenoid-based arthroscopic labral reconstruction with a modified inferior capsular shift resulted in low failure rate, high return to sport rate with no loss of motion, and no evidence on plain radiographs of narrowing of the glenohumeral joint.

Category: Shoulder - Instability

Distal Clavicle Versus Traditional and Congruent Arc Latarjet: Comparison Of Surface Area and Glenoid Apposition With 3-Dimensional CT and MRI

Abstract ID# 22570

All Authors:
Billy Insup Kim BA UNITED STATES
Caroline Hudson MD UNITED STATES
Dean C. Taylor MD UNITED STATES
Oke A Anakwenze MD, MBA UNITED STATES
Jon F. Dickens MD UNITED STATES
Brian Chei-Fai Lau MD UNITED STATES

Summary:
This study reports on the feasibility of 3D MRI for evaluation of distal clavicle and coracoid autograft options in patients with glenohumeral instability. Data:
Background Limited studies have compared graft-glenoid apposition and glenoid augmentation area between the latarjet and distal clavicle grafts in glenohumeral stabilization. Additionally, pre-operative planning is typically performed using computerized tomography (CT), and few studies have used 3-dimensional magnetic resonance imaging (3D-MRI) reformations to assess graft dimensions. The purpose of the study was two-fold: 1) compare bony apposition, glenoid augmentation, and graft width among coracoid and distal clavicle bone augmentation techniques and 2) determine the viability of 3D-MRI to assess bone graft dimensions. Methods Twenty-four patients with recurrent glenohumeral instability and bone loss were included in this study. 3D-CT and 3D-MRI reformations were utilized to measure pertinent dimensions for 5 orientations of coracoid and distal clavicle autografts: (1) standard Latarjet (SLJ), (2) congruent arc Latarjet (CLJ), and (3) distal clavicle attached by its posterior surface, (DPC) and (4) inferior surface (DCI), and (5) resected end (DCR). Glenoid augment area was defined as the graft surface area contributing to the glenoid. Bone-on-bone apposition was defined as the graft-glenoid contact area for bone healing potential, and graft width was pertinent for fixation technique. Paired t-tests were performed to compare graft sizes between patients and compare 3D-CT vs 3D-MRI measurements. Results CLJ had the largest glenoid augmentation area (mean: 3188mm², sd: 74) while SLJ displayed the most apposition (mean: 3188mm², sd: 74). DCI had the largest graft width (mean: 211mm, sd: 4). Paired t-tests revealed no significant differences between Latarjet methods, whereas distal clavicle grafts varied significantly with orientation. All 3D-CT and 3D-MRI measurements were within 1mm of each other, and only two demonstrated statistically significant difference (coracoid width: 13.03 vs 13.98mm, p=0.010; distal clavicle thickness: 9.69 vs 10.77, p=0.002). 3D-CT and 3D-MRI measurements demonstrated strong positive correlation (r=0.6 and p<0.001 for all dimensions). Conclusion Glenoid augmentation, bony apposition, and graft width can vary with coracoid or distal clavicle graft type and orientation. Differences between 3D-CT and 3D-MRI were small and likely not clinically significant. 3D-MRI is a viable method for pre-operative planning and graft selection in glenoid bone loss.

Category: Shoulder - Instability

Evaluation of External Rotation After Combined Bankart Repair And Remplissage for Anterior Shoulder Instability With Off-Track Hill-Sachs Lesion and Subcritical Glenoid Bone Loss <20%

Abstract ID# 22086

All Authors:
Mohammad Mahmoud Mahmoud Mahmoud Haidal MBCht, MSc(Orth) EGYPT
Ahmed El-Sayed El-Tantawy MD, PhD, Prof EGYPT
Tarek Ahmed Mohamed Aly MD, PhD, Prof EGYPT
Mahmoud Abdel-Monem El-Rosasy MD, PhD, Prof EGYPT
Ettore Taverna MD ITALY

Summary:
Hill-Sachs interval, number of anchors used in capsulotenodesis and time after operation are possible predictive factors of limitation of external rotation after combined Bankart repair and remplissage for anterior shoulder instability with off-track Hill-Sachs lesion and glenoid bone loss <20%. Data:
Purpose: Bankart repair and Remplissage (BR) has been advocated for anterior shoulder instability with off-track Hill-Sachs lesion (HSL) and subcritical glenoid bone loss (<20%). The purpose of this study was to evaluate the functional results after BR, with particular focus on external rotation (ER). Methods: 41 anterior shoulder instability patients with off-track HSL and glenoid bone loss <20% were treated with BR and followed for a median of 23 months. Functional outcome was assessed using the American Shoulder and Elbow Surgeons score (ASES) and the Western Ontario Shoulder Instability Index (WOSI). Shoulder range of motion (ROM) was assessed and compared to the opposite side including forward flexion (FF), external rotation at the side (ERa), external rotation in abduction (ERs) and internal rotations in abduction (ERa). Patient demographics, sports participation, number of dislocations, duration of instability, length of follow up, glenoid track, Hill-Sachs interval and number of anchors used for the remplissage were recorded for correlation with the results. Results: All patients showed marked improvement in the post-operative WOSI and ASES scores compared to preoperative status by a mean difference of 46.1% ± 19.5 and 29.2 ± 13.3 respectively. The mean reduction in ERs, ERa, FF and IRa were (22.5% ± 16.18), (13.09% ± 8.2), (2.46% ± 1.92) and (10.12% ± 6.) respectively. ERs limitation was significantly associated with time of final follow up (P=0.001, r=-0.711), HSI (P=0.001, r=-0.752), number of dislocations (p=0.013, r=-0.385), sport participation (p=0.010) and number of remplissage anchors (p=0.004). ERa limitation was significantly associated with time of final follow up (P=0.001, r=-0.569), number of remplissage anchors (p=0.003). Regression analysis revealed 3 significant predictive factors for ER limitation including time of final follow up, HSI and number of anchors. Conclusion: BRR results in good functional outcomes in patients with less than 20% glenoid bone loss and an off-track HSL. The results suggest that postoperative limitation in ER decreases overtime. Particular consideration and appropriate counselling should be undertaken in patients with large HSI and when more than one anchor for capsulotenodesis is anticipated due to an increased risk of ER limitation.

Category: Shoulder - Instability

Open Latarjet Using One-Screw Fixation Achieves a High Rate of Graft Fusion

Abstract ID# 23115

All Authors:
Antoine Catteeuw MD BELGIUM
Philippe Landreau MD UNITED ARAB EMIRATES

Summary:
One-screw fixation in the Latarjet procedure is an alternative to double screw fixation. It allows a high rate of fusion at 3 months. This technique can be used safely particularly if the surgeon judges that there is a risk of graft fracture like in
The Long Head Of the Biceps Tendon Does Not Provide A Clinically Significant Contribution To Anterior Glenohumeral Stability Even In the Setting of Glenoid Defects

Abstract ID# 22433
All Authors:
Alexander Otto MD GERMANY
Lauren K Szolomayer MD UNITED STATES
Joshua B. Baldino PharmD UNITED STATES
Mark P. Cote PT, DPT, MScTR UNITED STATES
ELIFHO OBOPILWE ME, BSc UNITED STATES
Andreas B. Imhoff MD, Prof. Emeritus GERMANY
Sebastian Siebenlist MD, MHBA, Prof. GERMANY
Augustus D. Mazzoceca MS, MD UNITED STATES
Julian Mehld M D GERMANY

Summary:
This biomechanical study evaluated the stabilizing effect of the long head of the biceps tendon and observed no clinical relevant contribution to glenohumeral stability.

Data:
Purpose The long head of the biceps tendon (LHBT) has been implicated as a common source of pain in the shoulder, but there is no consensus as to its effect on glenohumeral stability. The purpose of this study was to investigate the stabilizing effect of the LHBT in anterior glenoid defect models to determine if it contributes to anterior glenohumeral joint stability. Methods Twenty-four fresh-frozen cadaveric shoulders (age 60.1 ± 8.6 years) were randomized to 3 different defect groups (isolated soft-tissue Bankart lesion, 10% anterior glenoid defect, 20% anterior glenoid defect) which were mounted in a shoulder-testing system allowing 6 degrees of freedom. Glenohumeral translation was measured in the vulnerable ABER position by a 3D-digitizer as the difference between the start and end positions in the XY-plane after an anterior force was applied. Each specimen was tested under 18 conditions: 3 glenoid states (nateve, defect, repair), 3 anterior loads (20 N, 30 N, 40 N), and 2 LHBT tensions (0 N, 10 N). A linear mixed-effects model was generated to determine the effect of LHBT tensioning on glenohumeral stability. Results LHBT load had a statistically significant, but negligible, effect on glenohumeral translation in the anterior-posterior direction, decreasing it by 0.03 mm/N (72(1) = 5.87, p = 0.0154, 95% CI: [-0.06, -0.006]). There was no significant effect of LHBT tensioning in the superior-inferior direction. Conclusion In the context of soft tissue Bankart lesions and anterior glenoid bone defects up to 20%, load on the LHBT confers some anterior-stability to the glenohumeral joint, although this effect is so small as to not be clinically significant. The LHBT does not contribute to superior-inferior stability. Consequently, biceps tenotomy or tenodesis is a viable treatment for biceps pain in the setting of concurrent instability with a low probability to increase adverse events as glenohumeral instability.

Category: Shoulder - Instability

The Swing Test - Usefulness of a New Functional Examination to Evaluate Change of the Defensive Muscle Tonus of Thorax in Response to Anterior Shoulder Instability

Abstract ID# 22732
All Authors:
Yasunari Fujii MD JAPAN
Hironori Kakoi MD JAPAN
Hideyasu Kaieda Assistant Professor JAPAN
Toshikiho Izumi MD,PhD JAPAN

Summary:
We introduce the Swing test (ST), which is a new functional examination to evaluate change of the defensive thorax muscle tonus in response to anterior shoulder instability. Irrespective of sense of apprehension, in cases with the positive ST, when examiners tried to rock subjects’ shoulder back and forth, their shoulder was not swung at all due to defensively increased thorax muscle tonus. Data: Purpose: Shoulder disorders, such as rotator cuff tear, throwing shoulder injury, and instability are greatly correlated with scapular dyskinesis and other disorders of thorax, spine, and hip which cause a malfunction of kinetic chain. However, improvement of kinetic chain by conditioning of these disorders has a good effect on keeping a good shoulder condition and preventing shoulder injuries. Proprioceptive function by the central nerve system plays an important role in preventing shoulder instability using the feedforward system which makes shoulder abductor muscles contracted beforehand. We introduce a new functional method, the Swing test (ST) based on this feedforward system to evaluate shoulder instability quantitatively. Methods: We evaluated 25 shoulders with anterior shoulder instability using the ST (the mean of age with 25.3yrs). The ST evaluates change of thorax muscle tonus such as pectoralis major and latissimus dorsi during the anterior apprehension test which is a defensive reaction to avoid anterior shoulder instability. In cases with the positive ST, the thorax muscle tonus at instability side was clearly increased, irrespective of sense of apprehension. When examiners tried to rock subjects’ shoulder back and forth at the anterior apprehension test, their shoulder was not swung so well, while at healthy side, as the thorax muscle tonus was relaxed, their shoulder was swung well. At the time when they feel severe pain and apprehension around 90 degree’s abduction and external rotation, their shoulder was not swung at all owing to high thorax muscle tonus of thorax and trunk. Increased trunk muscle tonus in cases with the positive ST could be improved as soon as either horizontal abduction or external rotation of the shoulder was slightly decreased, and their shoulder swung well like healthy shoulders. Results: All of the 25 shoulders showed the positive ST result. Especially, at 80–100 degrees’ abducted position they showed thorax muscle tonus was even higher than that at the other abducted position, and their shoulders did not move at all. Discussion: Our all 25 shoulders exhibited the ST positive and in order to prevent anterior instability, defensive thorax muscle tonus was clearly increased and their shoulder was not moved against passive swing, especially around 90 degrees’ abducted position. The ST was one of the most useful tests to evaluate anterior shoulder instability functionally and quantitatively by comparing thorax muscle tonus between injured and healthy side during anterior apprehension test. This test enabled only examiners but also subjects to evaluate change of shoulder swing following defensive thorax muscle tonus together, and so subjects can notice what position makes their shoulder unstable, which plays an important role in prevention of their shoulder anterior dislocation and subluxation.

Category: Shoulder - Instability

Analysis of Bipolar Bone defects Pattern in Anterior Shoulder Instability

Abstract ID# 23317
All Authors:
Maristella Francesca Saccomanno MD, PhD ITALY
Francesco DeFilippo MD ITALY
Marcello Motta MD ITALY
Marco Adriani MD ITALY
Mac Donald Tedah Djemeto MD ITALY

Abstracts Journal of ISAKOS 8 (2023) S135-S146