anchor insertion into the inferior part of glenoid during arthroscopic labral surgery. The purpose of this study was to compare the clinical outcomes and radiological findings at the anchor site after arthroscopic Bankart repair with conventional biodegradable suture anchors and all-suture anchors.

Material and Method: A total of 67 patients were enrolled: 33 underwent surgery with an 1.3-mm (single loaded) or 1.8-mm (double loaded) all-suture anchor (Group A), and 34 underwent surgery with a 3.0-mm biodegradable anchor (10.8mm in length, 30% TCP/70% PLGA) (Group B). The inclusion criteria were patients with an isolated Bankart lesion in arthroscopic examination after anterior shoulder dislocation. Clinical outcomes, including the Rowe score, ASES score, return to preinjury sports level and redislocation rates were evaluated at 2 years after surgery. The degree of tunnel enlargement of the suture anchor insertion site was assessed with postoperative CT and CT arthrography at 1 year after operation according to the type and size of the suture anchor. To define the width of the tunnel, the greatest width of the hole along the suture anchor among the axial, sagittal, and oblique coronal planes was determined. Tunnel enlargement was calculated based on the difference between the width of the hole and the width of the suture anchor.

Results: Clinical outcomes did not differ significantly between groups A and B (ASES; Group A, 88.5 ± 12.3; Group B, 89.7 ± 10.9, P=0.667, Rowe score; Group A, 87.9 ± 14.9; Group B, 88.5 ± 14.6, P=0.857). The proportion of patients who returned to their preinjury level of sports at 2 years after operation was 81.8% in group A and 85.7% in group B. The postoperative redislocation occurred in two patients in group A (6.1%) and group B (5.9%. P=0.682), respectively. Total number of suture anchors inserted into the glenoid was significantly higher in group A (4.5 ± 0.9) than in group B (3.9 ± 0.5, P = 0.03). Average enlargement of the tunnel was significantly greater with the 1.8-mm all-suture anchor (2.8±0.9mm) than the 1.3-mm all-suture anchor (1.2±0.8mm) and 3.0-mm biodegradable anchor (0.8±1.2mm) (P<0.001). Enlargement of the tunnel was also significantly greater with the 1.3-mm all-suture anchor than the 3.0-mm biodegradable anchor (P < 0.01).

Conclusion: Despite of technical advantages of all-suture anchor insertion into the glenoid, the all-suture anchor demonstrated a significantly smaller load for 2 mm of labral displacement which is known to be associated with clinical fixation failure. However, an adequate application of upward force to a 6-kg weight deploy the all-suture anchor is regarded as an important factor to eliminate inferior fixation stability and early displacement. Despite concerns about the biomechanical results, our clinical outcomes of instability treatment with the all-suture anchor were equivalent to those of conventional biodegradable anchors. Arthroscopic Bankart repair with the all-suture anchor showed comparable clinical outcomes and postoperative stability compared to the biodegradable suture anchor at 2 years after surgery. Arthroscopic Bankart repair with the all-suture anchor showed comparable clinical outcomes and postoperative stability as the conventional biodegradable suture anchor at 2 years after surgery. Tunnel enlargement of the all-suture anchor was significantly greater than that of the biodegradable suture anchor at 1-year CT analysis. Although tunnel enlargement was greater with the all-suture anchor, it did not influence the clinical outcomes.

Paper #5 EFFECT OF THE LOCATION OF THE SPLIT OF THE SUBSCAPULARIS ON RANGE OF MOTION, STABILITY, AND CONTACT PRESSURE IN THE GLENOHUMERAL JOINT FOLLOWING LATARJET OR TRILLAT PROCEDURES

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Background: Biomechanical effects of the sling position in shoulder stabilizing repairs in not well understood. The purpose of this study was to determine the effect of the Latarjet and Trillat procedures on the glenohumeral range of motion, joint stability, and contact pressure as evaluated in a cadaveric model.

Methods: 12 fresh-frozen cadaver shoulders were cleared of all soft tissues except for the rotator cuff muscles. The medial scapular body was removed and the remaining scapula was potted in resin such that the rim of the glenoid was parallel to the floor. Glenoid length and width were measured along the superior-inferior and anterior-posterior axes using a digital caliper. The humeral shaft was potted in resin in a hollow tube for fixation to the testing apparatus. The potted bones were then mounted onto a custom testing frame generating anterior humeral translation and joint compression in the medial direction. Each specimen was tested in five conditions: 1) intact shoulder, 2) 6-mm bony glenoid defect (20% defect) 3) Trillat procedure, 4) Latarjet procedure with subscapularis split at the junction between its superior 2/3rds and inferior 1/3rd, 5) Latarjet procedure with subscapularis split at the superior 1/3rds and inferior 2/3rds. A thin film pressure sensor (Tekscan), was placed through a portal created on the posterior of the capsule and centered in the joint space, held in place by the compressive forces applied. Internal and external axial ranges of motion were measured with the joint positioned in 0°, 30° and 60° of glenohumeral abduction (or approximately 30°, 60° and 90° of arm abduction relative to the trunk) measured using a custom protractor fixed to humeral shaft and uniaxial torque cell. The torque cell was rotated about the humerus' long axis until a 200 N-mm torque was reached to determine range of motion. Joint stability was assessed in each condition by rotating the humerus into the previously determined maximum axial internal and external rotation at glenohumeral abduction angles of 0°, 30° and 60°. 50-N of medial compression was applied, and loads of 20 N and 5 N were also applied to the subscapularis and conjoined tendon, respectively, to simulate the sling effect. Starting from a position at which the humeral head was seated at its most medial position on the glenoid, the humeral head was translated anteriorly for 10 mm at a rate of 2 mm/sec. Reaction forces, anterior displacement, and lateral humeral head displacement data were collected at a sample rate of 100 Hz. Glenohumeral contact area and peak pressure were recorded at the end range of internal and external rotation. The stability ratio was computed as the ratio of the anterior translational force to the compression force on the joint at maximum displacement at each condition. Means were compared with a full factorial repeated measures ANOVA with pairwise post hoc comparisons. A Bonferroni correction was applied to account for the multiple comparisons.

Results: Stability ratios were significantly lower with the glenoid defect compared to the intact and all repaired conditions at all levels of glenohumeral abduction, but the Trillat and Latarjet repair values were not significantly different from each other. Internal and external ranges of motion were not significantly different between any condition or glenohumeral angle. While there were no significant differences in contact area at the end range of internal or external rotation between any conditions or glenohumeral angles, peak pressure was significantly lower for the Trillat condition compared to the intact condition at full external rotation and 0° glenohumeral abduction. Peak external rotation pressures in the intact condition were also significantly lower at 30° and 60° glenohumeral abduction compared to 0° abduction. Also peak pressure in internal rotation pressure was significantly lower at 0° glenohumeral abduction compared to 60° abduction.

Conclusions: The location of the subscapularis muscle split in the Latarjet repair does not significantly impact range of internal external rotation, the contact mechanics at end points of this range, nor the stability. Latarjet and Trillat procedures appear to be comparable procedures in these respects as no significant differences in assessment parameters were observed.

Paper #6 LATERALIZATION AND ATTACHMENT SITE AFFECT SUBSCAPULARIS BIOMECHANICS AFTER REVERSE SHOULDER ARTHROPLASTY

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