

Purpose: The purpose of this study is to report the results of arthroscopic Bankart repair following failed open stabilization.

Methods: We reviewed 22 patients with recurrent anterior instability after open surgical stabilization. There were 17 men and five women with an average age of 31 years (range, 15-65). The previous interventions consisted of 16 osseous transfers, three open Bankart repairs and three capsular shifts. The causes of failure were additional trauma in 12 patients and bone-block complications in 13. All patients had distension of the antero-inferior capsule. Labral re-attachment and capsulo-ligamentous re-tensioning with suture anchors was performed in all cases with an additional rotator interval closure in four patients and an inferior capsular plication in 12 patients. The bone block screws were removed in eight patients.

Results: Nineteen patients were evaluated at an average follow-up of 43 months (range, 24-72). One patient had recurrent subluxations, and two had persistent apprehension. Eight patients (42%) were still painful. Anterior elevation was unchanged and loss of external rotation was 6°. Nine patients returned to sport at the same level, and all patients returned to their previous occupation. Eighty-nine percent were satisfied or very satisfied. The mean subjective shoulder value (SSV), Walch-Duplay, Rowe and UCLA scores were $83\% \pm 23\%$, 85 ± 21 , 81 ± 23 and 30 ± 7 points, respectively.

Conclusions: Arthroscopic revision of open anterior shoulder stabilization gives satisfactory results. The shoulders are both stable and functional. However, our enthusiasm is tempered by some cases of persistent pain.

Posterior Humeral Avulsion of the Glenohumeral Ligament (Posterior HAGL) Lesions: Correlation Between MRI, Clinical, and Arthroscopic Findings (SS-07). Robert J. Schoderbek, Jr., MD, David Diduch, MD, Joe Hart, MD, Mark Anderson, MD

Summary: We concluded that posterior HAGL lesions are not significant clinically unless that patient has symptoms and a history specific for posterior instability. The majority of these lesions are identified with other pathology and probably represents a clinically insignificant finding or redundancy in the posterior structures. Treatment should be based on clinical history and findings on physical examination. The presence of a posterior HAGL on MRI does not mandate repair, especially when other problems explain the patient's pathology.

Purpose: Posterior humeral avulsion of glenohumeral ligament(HAGL) has been described as a cause of shoulder instability; however, there is an incomplete

understanding on the clinical significance of these lesions. The purpose of this study is to perform a retrospective review of patients diagnosed with a posterior HAGL by MRI and elucidate the clinical importance of this finding with a hypothesis that these lesions are not clinically significant.

Methods: Patients receiving an MRI for shoulder problems over a six year period were screened for the presence of a posterior HAGL lesion. To determine the clinical importance of this abnormality, we correlated the findings from the imaging studies to the clinical findings and arthroscopic evaluation if performed. We then contacted the patients by phone to assess their present symptoms with the visual analog scale, Tegner activity scale, and the subjective sections of the Society of the American Shoulder and Elbow Surgeons Rating Scale.

Results: Out of 5,476 patients that received an MRI for shoulder problems at our institution between 2000 and 2006, we identified thirteen patients with a posterior HAGL lesion. Clinical diagnosis allowed us to categorize these patients into two broad groups: seven patients with a diagnosis of rotator cuff/impingement and six patients with a diagnosis of multidirectional instability/trauma/repetitive overuse. Evaluation by radiographic imaging allowed us to organize the patients into two groups pertaining to pathologic findings: nine patients with a diagnosis of rotator cuff pathology and four patients with a diagnosis of isolated posterior labral pathology. Five of the thirteen patients received surgical intervention. Three patients underwent rotator cuff repair and were noted to have no arthroscopically visible posterior HAGL lesion. Two patients required surgical treatment of posterior capsulolabral pathology. One patient had her posterior HAGL lesion repaired and one patient underwent a reverse Bankhart repair with a posterior capsulorrhaphy. Ten of the 13 patients were contacted to assess their present symptoms. There were no significant differences noted between the clinical, radiographic, and surgical patient groups when comparing their present symptoms.

Conclusions: Humeral avulsion of the posterior band of the inferior glenohumeral ligament is an injury that has not been well recognized until recently due to improvements in imaging techniques (MRI) and an increased awareness of these lesions. We concluded that posterior HAGL lesions identified on radiographic imaging are not significant clinically unless that patient has symptoms and a history specific for posterior instability. The majority of these lesions are identified with rotator cuff and labral pathology and probably represents a clinically insignificant finding or redundancy in the posterior structures. Therefore, we feel that treatment should be

based on clinical history and findings on physical examination, and that the presence of a posterior HAGL on MRI does not mandate repair, especially when other problems (i.e. rotator cuff pathology) explain the patient's pain. Further study of the relationship between the MRI abnormalities and objective findings in patients diagnosed with a posterior HAGL lesion should lead to a better understanding of this lesion and assist in developing optimal treatment strategies.

Double-Bundle vs. Single-Bundle Anterior Cruciate Ligament Reconstruction: Prospective, Randomize Clinical Study (SS-08). *Timo Jarvela, MD, Markku Jarvinen, MD*

Summary: Sixty-five patients were randomized into either double-bundle (n = 35) or single-bundle (n = 30) ACL reconstruction with hamstring tendons and bioabsorbable screw (Hexalon, Inion Company, Finland) fixation in both group. At the 1-year follow-up, the rotational stability and the early anterior stability were significantly better in the double-bundle group than in the single-bundle group. In addition, none of the patients in double-bundle group had graft failure, while four patients in the single-bundle group had. However, knee scores were equal at the follow-up, and all the results were significantly better at the follow-up than preoperatively, in both groups.

Purpose: The purpose of this prospective, randomized clinical study is to compare the outcomes of anterior cruciate ligament reconstruction when using either double-bundle or single-bundle technique and bioabsorbable interference screw fixation with both techniques.

Methods: Sixty-five patients were randomized into either double-bundle (n = 35) or single-bundle (n = 30) ACL reconstruction with hamstring tendons and bioabsorbable screw (Hexalon, Inion Company, Finland) fixation in both group. The evaluation methods were clinical examination, KT-1000 arthrometer measurements, radiographic evaluation, as well as International Knee Documentation Committee (IKDC), and Lysholm knee scores.

Results: There were no differences between the study groups preoperatively. For the minimum of 1-year follow-up (range, 12 to 19 months), 31 patients of the double-bundle group and 27 patients of the single-bundle group were available (89%). At the follow-up, the rotational stability, as evaluated by pivot shift test, was significantly better in the double-bundle group than in the single-bundle group. Also, the early anterior stability was significantly better with double-bundle technique, although at 1-year follow-up, no significant difference

between the groups was found anymore. In addition, none of the patients in double-bundle group had graft failure, while four patients in the single-bundle group had. However, knee scores were equal at the follow-up, and all the results were significantly better at the follow-up than preoperatively, in both groups.

Conclusions: Rotational stability and early anterior stability were significantly better with double-bundle technique than with single-bundle technique in ACL reconstruction with hamstring autografts and bioabsorbable screw fixation. However, both fixation techniques improved patients' performance.

Magnetic Resonance Imaging Measurement of the Two Bundles of the Normal Anterior Cruciate Ligament (SS-09). *Steven B. Cohen, MD, Corinne VanBeek, MD, James Starman, MD, Derek Armfield, MD, James Irrgang, MD, Freddie Fu, MD*

Summary: To date, no study has assessed the magnetic resonance imaging (MRI) appearance of the AM and PL bundle. The purpose of this study was to assess the MRI appearance of the AM and PL bundle in patients with a normal ACL in order to determine the average length and width of each bundle as measured on digital imaging. In the sagittal plane MRIs, the AM bundle was an average of $36.9 \text{ mm} \pm 2.8 \text{ mm}$ in length, and $5.1 \text{ mm} \pm 0.7 \text{ mm}$ in width. The PL bundle, by contrast, was an average of $20.5 \text{ mm} \pm 2.4 \text{ mm}$ in length, and $4.4 \pm 0.8 \text{ mm}$ in width. In the coronal plane, the width of the AM bundle was $4.2 \pm 0.8 \text{ mm}$ and the PL bundle $3.7 \pm 0.8 \text{ mm}$.

Purpose: Anatomical studies have shown that the normal anterior cruciate ligament (ACL) consists of two distinct functional bundles, the anteromedial (AM) and posterolateral (PL) bundles. Cadaveric measurements of the bundles have revealed that the AM bundle is approximately 38mm in length and 7.1 mm in diameter, while the PL bundle is 18mm in length and 6.7 mm in diameter.

Arthroscopic assessment has shown that all individuals with a normal ACL, regardless of age, have both an AM and PL bundle. To date, no study has assessed the MRI appearance of the AM and PL bundle. The purpose of this study was to assess the MRI appearance of the AM and PL bundle in patients with a normal ACL in order to determine the average length and width of each bundle as measured on digital imaging.

Methods: Fifty consecutive MRIs of the knee were prospectively collected using a 1.5 Tesla magnet. Demographic data was collected including age, gender, height and weight.