

this study was to describe the morphologic features of the axillary nerve and its anatomical relationship to the glenoid under true arthroscopic setup. Also, we wanted to determine the practical aspect of the nerve position and its changes in relation to different arm positions during cadaveric arthroscopic simulation.

**Methods:** Eighteen paired fresh-frozen cadaveric shoulder specimens were used for evaluations. None of specimens had previous history of shoulder surgery or scar. Identical shoulder arthroscopic setup was applied to all the specimens, which was the same as the operating room (Lateral decubitus with posterior tilt 30° and 6-8lb traction with 20° flexion and 30° abduction, and pump pressure 80mmHg). Careful removal of capsule and soft tissue revealed the main trunk of the axillary nerve or with some of its branches. The axillary nerve morphologic description and documentation from the anterior and posterior portals were performed in all cases. The nearest distance from the glenoid rim was measured using the Neviaser portal with probe. Finally, the nerve was documented of its changes in the distance and its relationship from the glenoid rim depending on four different arm positions (Neutral meaning original traction setup, Abduction, Abduction-IR, and Abduction-ER). At the end of arthroscopic simulation, the nerves were marked and verified by open dissections to see if they were actually true axillary nerve.

**Results:** The axillary nerve almost always appeared in sight of the joint space around inferior edge of the subscapularis muscle after releasing an anterior bundle of inferior gleno-humeral ligament and seemed to be closest to glenoid rim at 5 o'clock (right) or 7 o'clock (left). With reference to the glenoid horizontally the main trunk appeared with mean angle of 29.3° (range, 15-35°) in neutral traction. Thereafter the nerve went away from the inferior glenoid rim and disappeared from the joint heading toward the quadrilateral space. The nearest distances from the glenoid rim to the nerve were 10-15mm in 1 shoulder, 15-20mm in 9 shoulders, 20-25mm in 7 shoulders, and 25-30mm in 1 shoulder with neutral arm positions. The four different arm position showed that abduction was helpful for moving the axillary nerve away from the glenoid most. The other two positions, ABD-IR and ABD-ER, did not change much of its relationship than abduction itself, furthermore, obstructed the visual field, which made arthroscopic surgery neither practical nor useful.

**Conclusions:** This study gives arthroscopic view of the main trunk of the axillary nerve. Between 4-8 o'clock position the nerve appeared, passed through inferior joint with average angle of 29.3° and the nearest distance of 15-20mm most commonly, and then disappeared. Slight

abduction and neutral position may be most practical in performing arthroscopic anterior and/or inferior capsular procedures, which made the axillary nerve far distant from the glenoid and provided maximum intraarticular space.

**Fenestration Capsulorrhaphy for Multidirectional and Posterior Instability (SS-05).** *Eugene M. Wolf, MD, E. Rhett Hobgood, MD*

**Purpose:** To present the results of a retrospective study evaluating a new arthroscopic technique for treatment of multidirectional instability.

**Methods:** Medical records were obtained of patients with disabling multidirectional instability requiring arthroscopic stabilization. With a minimum of 24 months follow-up, 45 patients treated from December 1999 to September 2004 were available for review. Of this group, 28 patients (31 shoulders) were able to be contacted for follow-up evaluation. There were 16 male and 12 female patients. Average age was 30.5 years (range 16-52). The arthroscopic technique focuses on reduction of excessive capsular volume. This was accomplished by creating fenestrations in the capsule. The fenestrations were then sutured closed in a pants-over-vest fashion to the adjacent labrum, or side to side in the areas of rotator interval and posterior capsule. Patients were interviewed and assessed via a previously published Subjective Shoulder Score evaluating six categories: pain, strength, function, stability, range-of-motion, and satisfaction.

**Results:** There were 20 excellent, 7 good, 2 fair, and 2 poor results. Two patients had a recurrence of instability. 93.5% of patients were satisfied or very satisfied with their procedure. Adhesive capsulitis occurred in one patient as the only complication.

**Conclusions:** Reducing capsular volume is an important objective in the arthroscopic management of multidirectional instability. Suture plication is widely accepted; however, penetrating multiple layers of capsule and labrum can exceed the limit of suture hooks. Fenestration capsulorrhaphy actually resects a specific amount of redundant capsule, the lateral margin of which is easily advanced and sutured to the abraded labrum. We have shown that this technique restores stability in this difficult subgroup of instability patients whose primary pathology is capsular laxity.

**Arthroscopic Revision of Failed Open Anterior Stabilization of the Shoulder (SS-06).** *Ryan T. Bicknell, MD, MSc, FRCSC, Julian Richou, MD, Jean-Francois Gonzalez, MD, Lionel Neyton, MD, Nicolas Jacquot, MD, Christopher Chuinard, MD, Pascal Boileau, MD*

**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  $83\% \pm 23\%$ ,  $85 \pm 21$ ,  $81 \pm 23$  and  $30 \pm 7$  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