

**Purpose:** Anterior traumatic shoulder instability, presenting with both glenoid bone loss and a Hill-Sachs lesion, has been shown to be recalcitrant to arthroscopic stabilization. This paper presents the results of an arthroscopic technique that is used to treat those difficult instability patients who present with anterior inferior glenoid loss and a Hill-Sachs lesion. The technique is a combined arthroscopic posterior capsulodesis and infraspinatus tenodesis using sutures and suture anchors that fills (Remplissage: french.: to fill) the Hill-Sachs lesion.

**Methods:** Twenty-two patients were treated with this technique between May 2002 and August 2004. Twenty patients were available for follow-up which ranged from 25 to 57 months. Eleven responded via a questionnaire posted on our web site. Nine were interviewed by telephone and all were rated by the previously published Subjective Shoulder Score. In addition to the Remplissage, all patients were treated concomitantly with a standard anterior suture anchor technique. Seven patients had had prior stabilization surgery. The system uses six categories to evaluate the outcomes: pain, stability, activity, strength, range of motion, overall satisfaction.

**Results:** Twenty patients were available for follow-up. There were 15 excellent, 3 good and 2 poor results. Two patients suffered traumatic redislocations, one due to a motorcycle accident and the other was reinjured wrestling. Both were treated with Latarjet procedures. Eighteen of twenty patients were very satisfied. All seven patients who had had prior failed open or arthroscopic stabilization surgeries, had good or excellent results without recurrence. One patient experienced post-operative stiffness that responded to non-operative measures. Two patients had secondary arthroscopic procedures: one for a painful posterior labral tear, the other for a prominent fixation device. These two procedures allowed second looks that both demonstrated the structural effect of the Remplissage, with the capsule and tendons healed into the Hill-Sachs lesion.

**Conclusions:** This procedure provides an effective arthroscopic alternative to open bone or bone-tendon transfers (Latarjet) in cases of anterior shoulder instability that presents with the combination of glenoid bony loss and a Hill-Sachs lesion. The results of this technique in this difficult subset of traumatic anterior shoulder instability patients are significantly better (10% recurrence rate) than those reported by prior authors (67% recurrence rate) using an arthroscopic Bankart alone to treat this type of pathology.

**Arthroscopic 'Filling' of Hill Sachs Lesions (SS-03).**  
*John D. Kelly, IV, MD, Shade Ogunro, MD*

**Summary:** The presence of Bony lesions of the humerus occurring after anterior instability (Hill Sachs Lesions) may adversely affect prognosis for dislocation recurrence. The Senior Author has employed an arthroscopic means of delivering Polygraft® (polylactide-co-glycolide) plugs to effect as least a partial 'fill' of the 'engaging' humeral head defect. Technical aspects of the procedure are delineated as is preliminary clinical data over the past 48 months.

**Purpose:** To report a new arthroscopic means of treating engaging humeral head defects found in anterior shoulder instability employing bone substitute.

**Methods:** Since 2004, the senior author has employed an arthroscopic means of attaining at least partial fill of 'engaging' Hill Sachs lesions of the humerus. The lesion is viewed from a proximal anterior portal and approached with an accessory posterior portal approximately 2cm medial and often distal to the standard posterior portal, although rarely lesion access is attained via the standard posterior portal. The lesion is debrided with a shaver and approached with an arthroscopic trephine (OATS System - Arthrex, Naples Florida). A bony bed of approximately 13mm is attained and subsequently filled with donor plugs of Polygraft® (OBI - Osteobiologics, San Antonio Texas) roughly 2mm longer than the prepared bony bed. The plugs are countoured to the bed with an oversized tamp and fit to match the contour of the articular surface.

**Results:** 12 patients underwent arthroscopic grafting of the engaging humeral head lesions using bone substitute. No significant intraoperative complications were experienced, nor were any deficits of the axillary nerve or infections noted. Clinical results are pending.

**Conclusions:** Engaging Hill Sachs lesions of the humeral head can be at least partially filled arthroscopically with bone substitute. No untoward effects or added patient morbidity appears to be the result of this technique. Clinical results are pending.

**Arthroscopic Perspective of the Axillary Nerve in Relation to the Glenoid and Arm Position: An Anatomic Study (SS-04).**  
*Jae Hoon Kim, MD, Jae Chul Yoo, MD*

**Summary:** We performed real arthroscopic simulation using cadaveric shoulder specimens to describe the morphologic feature and relationship of the axillary nerve, and thus determined changes depending on different arm position commonly used for arthroscopy.

**Purpose:** Although the anatomy of the axillary nerve is relatively well described in literatures, true arthroscopic perspective has been seldom reported. The aim of

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*