

Abstracts Presented at the 26th Annual Meeting of the Arthroscopy Association of North America

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Arthroscopic Versus Open Rotator Interval Closure: Impact on Glenohumeral Stability and Range of Motion (SS-01). *Matthew T. Provencher, MD, Timothy Mologne, MD, Michio Hongo, MD, Kristin Zhao, MD, James Tasto, MD, Kai An, MD*

Summary: Although RI closure is often advocated as an adjunct in certain conditions of shoulder instability, current evidence is largely based upon open studies which have documented improved posterior and inferior stability after open RI closure. The open RI closure studies are often applied to arthroscopic RI closure, even though arthroscopic closure plicates dissimilar tissue in a different vector from open closure. Arthroscopic RI closure conferred little additional stability to the shoulder, while open RI closure only improved anterior and inferior stability. This study calls into question the practice of routine closure of the rotator interval in certain cases of shoulder instability, especially with arthroscopic techniques.

Purpose: There is considerable debate regarding the role of rotator interval (RI) repair of the shoulder in order to improve glenohumeral stability. Although RI closure is often advocated as an adjunct in certain conditions of shoulder instability, current evidence is largely based upon open cadaveric studies which have documented improved posterior and inferior stability after open RI closure. The open RI closure studies are often applied to arthroscopic RI closure, even though arthroscopic closure plicates dissimilar tissue in a different vector from open closure. The purposes of this study are to investigate the differences between open and arthroscopic repair of the RI on glenohumeral translation and range of motion. Additionally, we seek to determine if the addition of either an open or arthroscopic RI closure increases stability of the shoulder.

Methods: A total of 14 fresh-frozen (10-paired) cadaveric shoulder specimens were mounted in a custom testing apparatus using infrared sensors to document glenohumeral translation and rotation, randomly allocated to either open (7) or arthroscopic (7) plication of

the RI. The following were measured first with an intact and vented specimen, 1) external and internal rotation at neutral, 2) external and internal rotation at 90° abduction, 3) anterior and posterior translation at neutral rotation, 4) anterior translation at 90° abduction with external rotation, and 5) posterior translation at 90° abduction with internal rotation. A RI repair was then performed by either open or arthroscopic techniques with the arm placed in 45° of external rotation, and the testing sequence repeated to determine the effect on glenohumeral kinematics after RI repair.

Results: Posterior stability was not improved from the intact state by either open or arthroscopic repair. The sulcus stability was only improved in the open group (5.7 mm to 2.9 mm, $p=0.028$), but not arthroscopically (5.1 mm to 4.1 mm, $p=0.499$). Neutral anterior stability was improved in open (7.2 mm to 2.6mm, $p=0.018$), but not arthroscopically (2.3 to 2.4 mm, $p=0.5$). However, anterior stability with ER at 90° was decreased in the arthroscopic repair group (5.5 mm to 3.1 mm, $p=0.006$). (Figure 1) The mean loss of ER in neutral was 40.8° in the open group versus 24.4° in the arthroscopic group ($p=0.0038$). ER in 90° abduction demonstrated more loss arthroscopically (11.7°) versus open (4.8°), $p=0.018$. (Figure 2) There were no significant differences in loss of IR in either neutral or 90° abduction.

Conclusions: Posterior stability was not improved by either open or arthroscopic rotator interval repair and sulcus stability only improved by the open technique. Anterior stability in neutral was improved after open repair, and in the arthroscopic repair group with the arm abducted. One should be aware of the potential loss of ER after either repair method. This study calls into question the practice of routine closure of the rotator interval in certain cases of shoulder instability, especially with arthroscopic techniques.

Hill-Sachs “Remplissage:” An Arthroscopic Solution For the Engaging Hill-Sachs Lesion. (SS-02). *Eugene Michael Wolf, MD, Michael Pollack, MD, Chad Smalley, MD*

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