Arthroscopic Repair of a Posterior Bony Bankart Lesion

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Abstract: Posterior bony defects of the glenoid rim, particularly those associated with instability, are often a frustrating challenge for arthroscopists because of the defects’ inaccessibility from standard portals. This challenge is enhanced when the lesion is chronic and fibrous malunion of the fragment makes mobilization difficult. We present our technique for arthroscopic repair of the relatively uncommon chronic posterior bony Bankart lesion. By use of lateral positioning and a standard anterior viewing portal and posterior working portal, as well as a strategically placed posterolateral accessory portal, the lesion is first freed from its malreduced position and ultimately repaired using suture anchor fixation of the bony fragment along with its associated labrum directly to the remaining glenoid rim. This technique, facilitated by precise portal placement, results in satisfactory fragment reduction, appropriate capsular tension, and restoration of anatomy.

Although the literature supports multiple arthroscopic techniques for the repair of both anterior and posterior shoulder instability, as well as associated anterior bony lesions,1-3 little evidence exists regarding the arthroscopic management of posterior glenoid rim defects. Historically, bony Bankart lesions involving more than 25% of the anterior rim or 33% of the posterior rim were thought to mandate open reduction–internal fixation (ORIF), whereas smaller lesions were often excised, with varying results.4 The few studies available focus on anterior bony Bankart lesions and describe poor results with arthroscopic fixation, citing higher failure rates when bony pathology is addressed than when arthroscopic stabilization is performed in the absence of bony fragments.5,6 None of these studies address posterior bony lesions, examine the quality of the glenoid reduction, or directly compare arthroscopic and open methods of fixation.

This report describes a technique of arthroscopic stabilization for post-traumatic shoulder instability associated with both large posterior labral and posterior bony Bankart lesions (Tables 1-3, Video 1). Typical arthroscopy portals are adjusted for adequate visualization and access to the bony fragment, and accessory portals facilitate suture passage and anchor placement.

Diagnosis and Surgical Technique

In our experience, a number of patient-specific and radiographic factors influence the decision to proceed with arthroscopic stabilization for posterior instability. The chronicity, mechanism, and presence of instability in multiple directions must all be considered. In addition, examination of the contralateral side, both in the clinic and subsequently under anesthesia, is mandated. Once a bony Bankart lesion is confirmed by radiography or magnetic resonance imaging with intra-articular gadolinium, computed tomography (CT) evaluation can be helpful to assess the size of the fragment and version of the glenoid. The presented case had symmetrical clinical examination findings but a large posterior rim fragment on CT (Fig 1) and magnetic resonance imaging (Fig 2), as well as symptoms affecting daily activities.

The patient is placed under general anesthesia, allowing a careful physical examination in the absence of any potential guarding. An assessment for bilateral anterior and posterior laxity, as well as range of motion (ROM), is performed, emphasizing differences in internal and external rotation. After an examination under anesthesia, the patient is placed into the lateral...
The decubitus position with 12.5 lb of traction applied to the arm. The surgical procedure commences with the following steps.

**Step 1**

The surgeon creates a standard posterior arthroscopy portal, which is positioned slightly more laterally and superiorly to facilitate an eventual working portal that is positioned at the appropriate angle for suture passage around the posterior labrum (analogous to the inferior working portal in anterior arthroscopic labral repair). A standard 4-mm 30° arthroscope is inserted.

**Step 2**

A standard anterolateral portal is created under direct vision. Diagnostic arthroscopy is performed, and specific attention is given to the degree of wear on the posterior glenoid rim, the location of the bony Bankart fragment, and the presence or absence of remaining labrum on the detached fragment (Fig 3). A complete diagnostic arthroscopy must note the presence or absence of a reverse Hill-Sachs lesion or reverse humeral avulsion of the glenohumeral ligament (HAGL lesion), as well as the integrity of the anterior and posterior bands of the inferior glenohumeral ligament.

**Step 3**

Under direct visualization, an accessory posterolateral portal is created using an 18-gauge spinal needle to verify the correct trajectory that will facilitate suture management and access to the fragment. This will vary depending on the patient-specific Bankart lesion, with less medially displaced fragments requiring more lateral working portals and slightly less lateral accessory portals.

**Step 4**

With the arthroscope in the anterolateral portal, the posterior bony Bankart fracture and labrum are mobilized with an osteotome followed by a rasp (Arthrex, Naples, FL). This work is performed through a combination of the posterior working and posterolateral accessory portals and is dependent on the amount of medialization present. Great care must be taken to avoid causing any iatrogenic bone loss but to rasp sufficiently so that there is an adequate bleeding surface for the fragment to heal.

**Step 5**

Once the fragment is mobilized, it is reduced to its anatomic position under direct visualization. This can often be facilitated by the remaining attached labrum, which acts to help the surgeon adequately assess depth and superior-inferior placement of the fragment.

**Step 6**

Two Arthrex Bio-SutureTak suture anchors are placed at the remaining posterosuperior and...
posterior-inferior margins of the glenoid rim using the accessory posterolateral portal. The No. 2 FiberWire sutures (Arthrex) are then brought through the capsulolabral complex using a QuickPass SutureLasso with a nitinol wire loop (Arthrex) to include the bony Bankart fracture in a horizontal mattress fashion (Figs 4 and 5). This allows for both reduction of the fracture and repair of the capsulolabral complex.

**Step 7**

The sutures are tied and the knots buried in the extra-articular capsular tissue using a knot pusher. This is performed with the shoulder in neutral rotation to avoid over-tensioning. The capsule will be shifted only minimally, thus slightly retensioning the posterior band of the glenohumeral ligament.

**Postoperative Rehabilitation**

The shoulder is immobilized immediately after surgery in an external-rotation UltraSling (DonJoy, Carlsbad, CA) in approximately 30° of abduction, with prevention of internal rotation and placement in a near neutral position for 4 to 6 weeks postoperatively, depending on the amount of capsular laxity seen at the time of surgery. During this period, pendulum exercises and scapular retraction are allowed. At 4 to 6 weeks, sling immobilization is discontinued, gentle active and active-assisted ROM exercises are advanced, and gentle pain-free internal rotation is allowed. By 2 to 3 months after surgery, ROM is progressed to achieve full passive and active ROM. Strengthening exercises are instituted and isotonic strengthening continued with an emphasis

**Fig 1.** Computed tomography scan with 3-dimensional reconstruction looking at the face of the glenoid and showing the extent and location of the posterior bony Bankart lesion, which is medialized and comprising approximately 10% to 15% of the glenoid.

**Fig 2.** An axial magnetic resonance image with intra-articular gadolinium toward the mid-inferior portion of the glenoid, showing the posterior bony Bankart fracture and associated labral pathology. One should note the extravasation of fluid deep along the posterior border of the remaining glenoid and surrounding edema, suggesting the lesion’s chronicity. (Al, anterior; LI, left; PS, posterior; RS, right.)

**Fig 3.** Arthroscopic view from the anterolateral viewing portal with the arthroscopic osteotome used through the posterior working portal, allowing direct visualization of the bony fragment (on the right) with the attached labrum as it is elevated from its medialized position on the remaining glenoid (on the left).
on the rotator cuff and periscapular muscles with avoidance of dyskinesia.

Discussion

The dominant source of symptomatic posterior instability is thought to be attritional deficiencies of the glenoid rim and not actual bony fractures, making the posterior bony Bankart lesion an uncommon finding. The relative paucity of literature supporting its treatment often leaves surgeons without proper guidance when faced with symptomatic patients. Extrapolating from results of published studies examining the treatment of anterior and inferior rim deficiencies, we found that lesions comprising less than 25% of the rim were often excised, whereas in certain instances, these lesions were best managed with ORIF. In particular, lesions measuring greater than 21% of the glenoid length can decrease the intrinsic stability of the glenoid by 50%, thereby mandating ORIF with screws or suture anchors to prevent recurrent instability. Published results of the arthroscopic treatment of bony glenoid defects, however, have been limited.

We describe an arthroscopic method of addressing both the bony and labral pathology in a traumatic posterior Bankart lesion with the use of suture anchors. This method achieves anatomic restoration of the posterior glenoid rim with the theoretical benefits of an arthroscopic procedure over an open procedure, including diminished postoperative pain and earlier return to motion because of decreased muscle damage. Appropriate placement of portals is crucial to the visualization and mobilization of the fragment. In this particular technique, the posterior portal is slightly more superolateral to ensure that the eventual posterior working portal is positioned at the appropriate angle for suture passage around the posterior labrum. An anterolateral rotator interval portal is then made instead of the typical anterior portal. When viewed from this portal, the posterior shoulder is seen over the humeral head, rather than “through” the glenohumeral joint.

Whereas techniques for the arthroscopic fixation of the rare posterior bony Bankart lesion are scarce in the literature, this unique case shows how the combination of preoperative preparation and intraoperative technique can yield a successful result. It is important to suspect this bony pathology, carefully scrutinize radiographs, and assess further by CT scan when necessary.

Our technique offers the distinct advantage of being accomplished through arthroscopic portals, thereby avoiding the morbidity and over-tensioning often associated with open surgery. In addition, this case represents a chronic Bankart lesion, and the primary challenge was mobilizing the fragment to obtain adequate reduction. More acute cases may eliminate this technical challenge.

Our technique is also subject to some limitations, particularly the narrow patient selection parameters. First, careful attention must be paid to the preoperative imaging because fragments involving more than 20% to 25% of the glenoid are unlikely to obtain stability with this type of fixation. Second, the patient must be warned that the

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Fig 4. Arthroscopic view from the anterolateral viewing portal showing a nitinol wire loop passer being directed under the Bankart fragment at the edge of the remaining glenoid. This suture passer has incorporated the entire bony fragment, as well as a portion of the posterior capsule.

Fig 5. Arthroscopic view from the anterolateral viewing portal showing the final reduction of the bony and labral fragments to the glenoid. One should note that the labrum has been used to reapproximate the fragment and is now in continuity, and the posterior capsule has been imbricated. The suture knots were tied in an extra-articular manner and with the shoulder in neutral rotation to avoid over-tightening of the capsule.
arthroscopic procedure may indeed be only a diagnostic arthroscopy because intraoperative findings of an unexpected reverse Hill-Sachs lesion or humeral avulsion of the glenohumeral ligament (HAGL lesion) should caution the surgeon to consider open techniques. This has the detrimental effect of a second operation and anesthesia administration. Finally, surgeon selection regarding portal placement is critical to the success of this technique because inadequate positioning can limit access to the fragment and lead to malreduction.

References