Arthroscopic Posterior Capsulolabral Repair in a Beach-chair Position

Shital N. Parikh, MD; Paul W. Schuppner, DO

Abstract: The authors describe an arthroscopic surgical technique for posterior capsulolabral repair using standard portals while patients are in the beach-chair position. The technique is unique in that the suture anchors are inserted from a superior-to-inferior direction instead of the traditional posterolateral-to-anteromedial direction. It involves the use of a posterolateral or mid-lateral portal through the rotator cuff for suture anchor insertion while viewing from the standard anterior portal. The technique avoids the risk of articular cartilage damage or glenoid rim fracture due to skiving during suture anchor insertion from a posterior or accessory posterior portal.

Poster: The authors describe an arthroscopic surgical technique for posterior capsulolabral repair using standard portals while patients are in the beach-chair position. The technique is unique in that the suture anchors are inserted from a superior-to-inferior direction instead of the traditional posterolateral-to-anteromedial direction. It involves the use of a posterolateral or mid-lateral portal through the rotator cuff for suture anchor insertion while viewing from the standard anterior portal. The technique avoids the risk of articular cartilage damage or glenoid rim fracture due to skiving during suture anchor insertion from a posterior or accessory posterior portal.

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osterior shoulder instability is a relatively rare condition. It is commonly associated with an injury to the posterior capsulolabral complex. Arthroscopic treatment of posterior shoulder instability has shown promising results.1,2 When compared with open procedures, the advantages of arthroscopic treatment include shorter operative time, improved cosmesis, and reduced morbidity and pain.3 Although shoulder arthroscopy can be performed in the beach-chair or lateral decubitus position, the majority of surgeons prefer the lateral decubitus position for posterior capsulolabral repairs.1,2 A major advantage of the lateral decubitus position is that circumferential access to the glenohumeral joint is optimized through balanced suspension.4 Surgeons who prefer the beach-chair position may find posterior instability repairs challenging due to limited access to the posterior and posteroinferior aspect of the glenoid in the absence of abduction and traction of the shoulder joint. With the exception of 1 report,5 to the authors’ knowledge no other report has been published on posterior shoulder instability repair in the beach-chair position. The current report describes a surgical technique for posterior capsulolabral repair using routine arthroscopic portals with patients in the beach-chair position.

Surgical Technique

After general anesthesia induction, the patient is placed in the beach-chair position. An examination is performed prior to sterile preparation to confirm the direction and degree of instability. A comparison with the contralateral shoulder is then performed. The landmarks and portals are marked on the shoulder (Figure 1A). The standard posterior portal is established using an 8-mm translucent cannula, and diagnostic arthroscopy is performed using a standard 30° arthroscope. The current report describes a surgical technique for posterior capsulolabral repair using routine arthroscopic portals with patients in the beach-chair position.

Materials and Methods

A retrospective study was performed to identify patients who underwent arthroscopic posterior capsulolabral repair while in the beach-chair position between 2008 and 2011. Their clinical charts and imaging studies were reviewed. All patients underwent outpatient surgery using a similar technique. The indications for arthroscopic posterior capsulolabral repair are: recurrent posterior subluxation with a posterior labral tear, a history of posterior shoulder dislocation with disabling symptoms, multidirectional instability with a primary posterior component, and habitual posterior dislocations that failed conservative treatment.

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The authors have no relevant financial relationships to disclose.

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doi: 10.3928/01477447-20130327-04

Abstract: The authors describe an arthroscopic surgical technique for posterior capsulolabral repair using standard portals while patients are in the beach-chair position. The technique is unique in that the suture anchors are inserted from a superior-to-inferior direction instead of the traditional posterolateral-to-anteromedial direction. It involves the use of a posterolateral or mid-lateral portal through the rotator cuff for suture anchor insertion while viewing from the standard anterior portal. The technique avoids the risk of articular cartilage damage or glenoid rim fracture due to skiving during suture anchor insertion from a posterior or accessory posterior portal.
The extent and type of posterior labral tear is confirmed from the anterior portal, an incision is made. Then, under arthroscopic visualization from the anterior portal, an incision is made through the rotator cuff parallel to the tendon fibers. A switching stick is placed into the joint through this incision, followed by the placement of a 6-mm translucent cannula through this portal.

With the arthroscope in the posterior portal, the posterior portal is used as a working portal for mobilization of the capsulolabral tissue and preparation of the glenoid using a tissue liberator and a motorized shaver (Figure 1C). Alternatively, with the arthroscope in the anterior portal, the posterolateral portal could be used as a working portal. A 25° cannulated suture lasso (SutureLasso SD; Arthrex, Naples, Florida) replaced with FiberStick (Arthrex, Naples, Florida), which is the definitive suture used for capsulolabral repair. This step alleviates the need for a monofilament suture or wire suture shuttle (A). Arthroscopic image showing the 25° left-sided suture lasso inserted from the posterior portal (B). Arthroscopic image showing the suture lasso passed through the capsule and underneath the torn labrum (C).

The extent and type of posterior labral tear is confirmed through the anterior portal (Figure 1B). The posterolateral portal is then established in line with the posterior glenoid rim. The location of the portal is 2 cm lateral and 1 cm anterior to the postero-lateral corner of the acromion (Figure 1A). This portal has to be individualized to the patient’s anatomy and may have to be moved anterior to make it a mid-lateral portal (lateral to the mid-acromion) to achieve a direct trajectory to the posterior glenoid rim. This portal has been previously described as a trans-cuff portal for access to the superior labrum or as a viewing portal for posterior labral repairs. Viewed from the anterior portal, a spinal needle is placed through the musculotendinous junction of the rotator cuff. A small skin incision is made. Then, under arthroscopic visualization from the anterior portal, an incision is made through the rotator cuff parallel to the tendon fibers. A switching stick is placed into the joint through this incision, followed by the placement of a 6-mm translucent cannula through this portal.

With the arthroscope in the posterolateral portal, the posterior portal is used as a working portal for mobilization of the capsulolabral tissue and preparation of the glenoid using a tissue liberator and a motorized shaver (Figure 1C). Alternatively, with the arthroscope in the anterior portal, the posterolateral portal could be used as a working portal. A 25° cannulated suture lasso (SutureLasso SD; Arthrex, Naples, Florida) replaced with FiberStick (Arthrex, Naples, Florida), which is the definitive suture used for capsulolabral repair. This step alleviates the need for a monofilament suture or wire suture shuttle (A). Arthroscopic image showing the 25° left-sided suture lasso inserted from the posterior portal (B). Arthroscopic image showing the suture lasso passed through the capsule and underneath the torn labrum (C).

With the arthroscope in the anterior portal, a drill guide is placed through the posterolateral portal and is angled approximately 45° superior-to-inferior (Figure 4A). Using gentle pressure and leverage on the humeral head, the guide is positioned at the desired point on the posterior glenoid rim (typically at the 5- or 7-o’clock position for the left and right shoulders, respectively) (Figures 4B, C). The pilot hole is drilled using a 2.8-mm drill bit, and the suture anchor is then manually inserted into the pilot hole (Figure 5A). The suture anchor is gently impacted with a mallet once adequate tensioning of the capsule-labral tissue is achieved (Figure 5B). Forceful impaction of the suture anchor or deviation of the direction of suture anchor insertion can lead to suture anchor breakage. Once inserted, the suture anchor handle is removed by rotating it in a counterclockwise position. The sutures are cut using an arthroscopic suture cutter (Figure 5C). Similar points of fixation and anchor placement are achieved at the 3- and 4-o’clock positions for the left shoulder or the 8- and 9-o’clock positions for the right shoulder. A straight suture lasso may be used for suture passage through the
capsulolabral tissue at the 3- and 9-o’clock positions. During posterior repairs, the arm is kept by the side in neutral rotation to avoid excessive tightening of the posterior tissues. In cases of difficult visualization or a tight shoulder, the sequence of anchor placement is altered so that the most inferior anchor placement is deferred until the end because access to the posteroinferior aspect of the glenoid becomes easier as the superior anchors are placed and the capsulolabral tissue is repaired. At the end of the procedure, a load and shift test is performed to document the repair and stability. An intrascapular block is performed by the anesthesiologist after completion of the surgical procedure.

Rehabilitation
The patient is placed in a Cryo/Cuff (Aircast, Summit, New Jersey) and a sling. Physical therapy is initiated 2 to 3 days postoperatively starting with gentle passive range of motion. At 3 to 4 weeks postoperatively, sling use is discontinued and active shoulder range of motion is started. Elastic bands and progressive resistive exercises are used between 6 to 12 weeks postoperatively, followed by strengthening exercises using weights. Patients are released to all activities, including sports, between 4 and 6 months postoperatively once they have achieved full range of motion and 80% of their strength (compared with the contralateral shoulder) on dynamometer (Biodex, Shirley, New York) evaluation.

RESULTS
Since 2008, the authors have used this technique in 22 patients with a mean age of 17.6 years (range, 11.5-20.6 years). Eight patients had an isolated posterior labral tear, and 14 posterior capsulolabral repairs were performed in conjunction with Bankart lesions, superior labral anterior to posterior lesions, or capsular plication. In 2 patients, a suture anchor broke while it was impacted in the drill hole. The broken part of the anchor was retrieved, and another anchor was inserted into a separate drill hole. No other intraoperative or postoperative complications occurred.

DISCUSSION
Costouros et al5 reported the arthroscopic technique...
and the results of performing a posterior labral repair in the beach-chair position for 5 patients. The trans-cuff portal was used for arthroscopic visualization of the posteroinferior glenoid using a 70° arthroscope, and the anchor insertion was performed using a posterior or accessory posteroinferior portal. The current authors agree with Nord et al.\(^7\) that using a posterior or accessory posterior portal is not optimal for suture anchor placement for posterior labral repairs because the portals are relatively parallel to the glenoid surface and have an increased risk of skiving, articular cartilage damage, and glenoid rim breakthrough.

The current surgical technique is unique in that the suture anchors are placed in a superior-to-inferior direction instead of traditional posterolateral-to-anterosuperior direction. Placing the suture anchors through the posterolateral or mid-lateral portal may seem difficult, but the gravity-assisted inferior pull on the humeral head and gentle pressure from above during instrumentation places this portal at a 45° superior-to-inferior angle to the face of the posterior and posteroinferior glenoid (Figures 6, 7). Although the authors do not use muscle relaxation drugs intraoperatively, it could be used to further achieve inferior translation of the humeral head. In cases of suture anchor breakage in hard bone, as occurred in 2 current patients, a 2.9-mm drill bit instead of a 2.8-mm drill bit could be used as per the manufacturer’s recommendations. The trans-cuff portal has been reported to access the posterosuperior glenoid for the repair of superior labrum anterior to posterior lesions\(^6,7\) and for visualization of the posteroinferior glenoid,\(^5\) but its use for suture anchor placement in the posteroinferior glenoid has not been reported. The concern for iatrogenic rotator cuff tear due to the placement of posterosuperior or mid-lateral portal has not been substantiated by clinical results, which have shown no detrimental effect of placing such a portal through the rotator cuff.\(^6,7\)

Nord et al.\(^8\) recommended using a low posterolateral portal, placed 2 to 4 cm lateral and 4 to 5 cm inferior to the posterosuperior corner of the acromion, for its optimal angle of the insertion of suture anchors. However, if not placed precisely, the portal would place branches of the axillary nerve and posterior circumflex artery at risk for injury. Any accessory posterior portal, besides the posterior viewing portal, would also lead to overcrowding in the posterior glenohumeral joint.

The current arthroscopic technique is based on standard portals, including the posterosuperior or mid-lateral portal, whose safety in the beach-chair position has been well established. In addition, the combination of the posterior, anterior, and posterolateral or mid-lateral portal would place each portal farther from the other, making instrumentation and suture management easier.

### References


