

Technical Note

Horizontal Mattress With a Knotless Anchor to Better Recreate the Normal Superior Labrum Anatomy

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Abstract: Arthroscopic repair of type II superior labral tears using suture anchors has resulted in a good to excellent outcome in most cases. In throwing athletes, however, the results have not been as consistent. Although it has not been reported in the literature, it is also possible that, in a very small number of throwers, the limited space in the glenohumeral joint combined with the bulky knots used to secure the labrum to the anchor may be a cause of discomfort. In addition, the superior labrum is meniscoid in appearance, which traditional SLAP repair techniques do not recreate. We describe here a novel technique using a knotless anchor to repair the superior labrum, thereby eliminating the potential for knot-related complications. More importantly, this horizontal mattress–knotless anchor technique better recreates the normal meniscoid appearance of the superior labrum. **Key Words:** Horizontal mattress—SLAP repair—Knotless anchor—Throwing athlete.

Arthroscopic repair of type II superior labral tears using suture anchors has resulted in a good to excellent outcome in most cases. However, the results have not been as consistent in throwing athletes.^{1,2} Some of the poor results are probably because of the associated pathology often present in these patients, such as rotator cuff tears, posterior capsular contracture, and/or anterior instability.^{3,4} Although it has not been reported in the literature, it is also possible that, in a very small number of throwers, the limited space in the glenohumeral joint combined with the bulky knots used to secure the labrum to the anchor may be a cause of discomfort. Rhee and Ha⁵ reported a case of knot-induced glenoid erosion after arthroscopic suture

anchor repair of a type II SLAP lesion, so this too could be a source of continued pain after surgery.

Many authors have espoused the benefits of knotless suture anchor repairs. In this article we describe a novel technique using a knotless anchor to repair the superior labrum, thereby eliminating the potential for knot-related complications. More importantly, this horizontal mattress–knotless anchor technique better recreates the normal meniscoid appearance of the superior labrum.

TECHNIQUE

We prefer to use the lateral decubitus position for shoulder arthroscopy. A beanbag is used to position the patient tilted 30° posteriorly, and the arm is suspended at 30° to 40° of abduction and 10° to 20° of flexion by use of 10 to 15 lb of traction. The patient is placed in the Trendelenburg position. A standard posterior portal is made with a blunt trocar, with care being taken to penetrate the posterior capsule parallel to the glenoid at the midpoint of the glenoid rim. This is usually about 2 cm distal to the posterior acromion in line with the lateral border of the acromion. A

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N.S.E. has received support from Arthrex, Naples, Florida, exceeding \$500 related to this research.

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0749-8063/08/2412-8275\$34.00/0

doi:10.1016/j.arthro.2008.06.012

medial or superior portal may impair visualization during the repair.

When one is evaluating the superior labrum, it is important to note that pathologic mobility is represented by irregularity of the labral undersurface and chondromalacia of the cartilage on the superior glenoid rim. At this point, we make a standard anterior working portal under direct visualization using a spinal needle to localize the ideal position. We put it in the superior aspect of the rotator interval, just beneath the biceps tendon. Next, a small curved shaver is used to debride pathologic tissue, with care being taken to preserve as much as possible for the repair. The glenoid attachment is debrided of soft-tissue remnants, and the neck of the glenoid is abraded up to the articular-glenoid margin over the entire extent of the lesion to enhance healing.⁶

An accessory superior portal is made just lateral to the lateral border of the acromion through the rotator cuff into the joint, with care being taken to remain medial to the rotator cuff “cable.” It is through this posterior portal that we begin the repair process. A SutureLasso (Arthrex, Naples, FL) pierces the posterior-superior labrum, and a free strand of nonabsorbable suture is passed through the device, beneath the labrum, into the joint (Fig 1). This intra-articular limb of suture is shuttled out the anterior portal, keeping the other limb outside of the accessory superior portal.

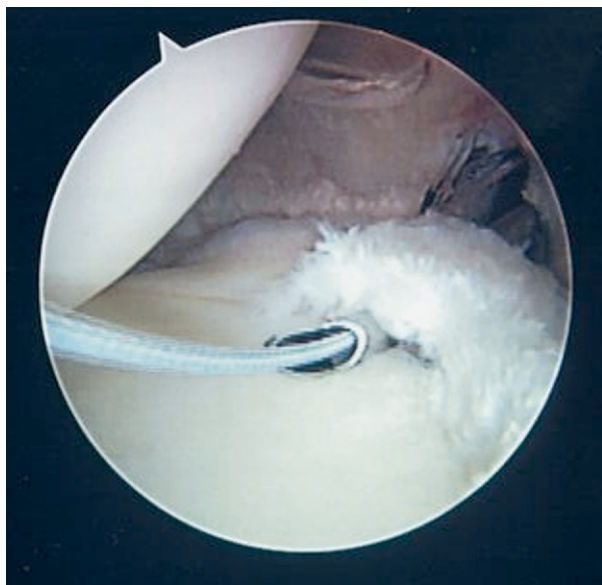


FIGURE 1. The SutureLasso has pierced the superior labral tissue, and a free strand of nonabsorbable suture is passed through the piercer (lateral decubitus position, right shoulder, view from anterior portal).

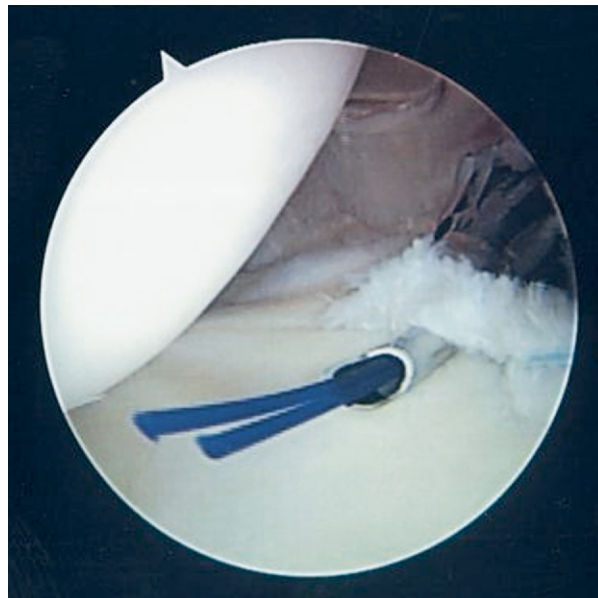


FIGURE 2. The process is repeated, taking care to pierce the superior labrum about 5 mm away from the original location. A monofilament suture is loaded through the piercer (lateral decubitus position, right shoulder, view from anterior portal).

The SutureLasso is used again to pierce the labrum about 5 mm posterior to the initial location, which forms a horizontal mattress stitch. This time, a monofilament suture is used to shuttle the limb of suture in the accessory superior portal through the labrum and out the anterior cannula (Fig 2).

At this point, both sutures are secured outside the anterior portal, and a drill guide is brought into the joint through the accessory superior portal. The guide is placed on the superior glenoid rim, and a pilot hole is drilled. The suture limbs are then brought out the superior portal and loaded into the PushLock Knotless Anchor (Arthrex). The sutures are tensioned, and the anchor is impacted into the glenoid (Fig 3). The process is repeated for an anterior anchor. At the completion of the procedure, the repair is probed to test labral and biceps stability. We remove the arm from traction and take it through the throwing motion to ensure that the “peel-back” lesion has been eradicated. The resultant repair recreates the meniscoid-shaped labrum while eliminating a potential source of discomfort in throwers that arises from suture knot material irritating the biceps tendon or chondral surfaces (Figs 4, 5).

After a SLAP repair, the shoulder is kept in a sling for 3 weeks. During this time, active elbow extension is started, as is forward elevation to the “salute posi-



FIGURE 3. The anchor loaded with sutures is impacted into the predrilled hole and tensioned to secure the labrum back to the glenoid (lateral decubitus position, right shoulder, view from anterior portal).

tion." External rotation, abduction past 60°, and abduction-external rotation are restricted during the first 4 to 6 weeks postoperatively. At about 4 months postoperatively, a throwing program is initiated, with

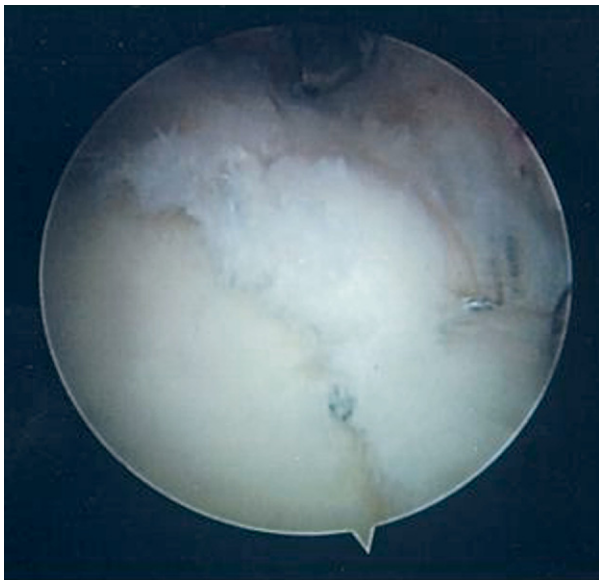


FIGURE 4. Meniscoid-shaped superior labrum after horizontal mattress-knotless anchor repair (lateral decubitus position, right shoulder, view from anterior portal).

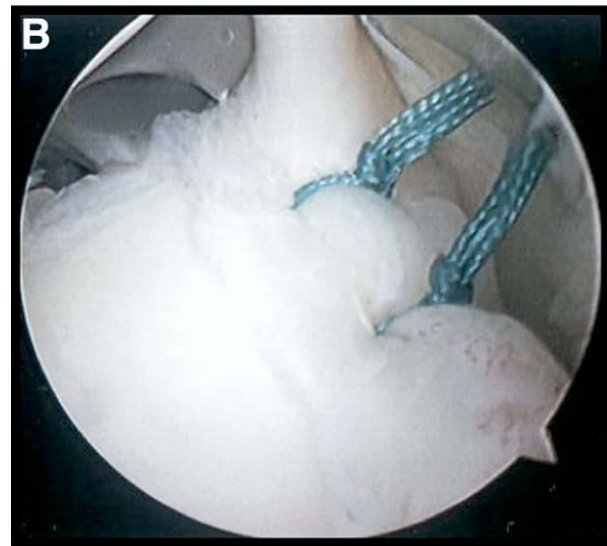


FIGURE 5. (A) Second-look arthroscopy in a different patient 7 months after horizontal mattress-knotless anchor repair showing a healed labrum with its normal appearance restored (left shoulder, view from posterior portal). (B) Comparison view showing a suture anchor repair that fails to recreate the normal meniscoid appearance of the superior labrum (right shoulder, view from posterior portal).

a gradual return to competition by 7 to 8 months after surgery.

DISCUSSION

Arthroscopic surgical repair of type II SLAP lesions has resulted in a good to excellent outcome in most cases. Fixation with suture anchors has been shown to provide biomechanically strong results leading to successful repairs.⁷ Learning to tie knots arthroscopically remains one of the more challenging elements of the learning curve associated with these repairs. Improper

knot tying can be a potential source of failure in patients undergoing SLAP repair. In addition, bulky knot formation can abrade the humeral head or glenoid after SLAP repairs.⁵ Recently, a case was reported in which a strand of suture from an arthroscopic knot that was used to secure a labral repair had rubbed against the glenoid and created a chondral defect.⁵

Knotless suture anchors have been reported to provide secure labral repairs while obviating the need for arthroscopic knots.⁸⁻¹⁰ These devices decrease surgical time and decrease the potential risks of knots causing chondral defects or even slight irritations on the bursal side of the rotator cuff or on the biceps tendon.

The technique we have described has all of the benefits previously attributed to knotless suture anchors. This may be of particular benefit for throwing athletes in whom bulky knots abrading the undersurface of the rotator cuff or biceps can make the difference between a successful return to throwing and a poor outcome. More importantly, the horizontal mattress configuration effects a more anatomic repair. Normally, the superior labrum is meniscoid in appearance, which traditional SLAP repair techniques do not recreate.

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