

Editorial Commentary: Is an Arthroscopic Single-Row Repair Effective for the Treatment of Chronically Retracted, Full-thickness Subscapularis Tears?



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Abstract: Retraction and scarring of subscapularis tears make arthroscopic fixation technically challenging. The ideal arthroscopic technique is still under debate, with new studies examining the importance of repairing the “leading edge.” Regardless of single- or double-row fixation, it is our opinion that restoring the native anatomy as well as any concomitant biceps pathology is essential for postoperative success.

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Arthroscopic techniques have not only enabled surgeons to perform more minimally invasive repairs but have also provided better visualization in recognizing often missed tears of the subscapularis tendon.¹⁻⁴ Surgical fixation of these injuries is often difficult due to the scarring and retraction that occur in chronic tears. In the study, “Clinical Outcomes and Tendon Integrity in Patients With Chronic Retracted Subscapularis Tear After Arthroscopic Single-Row Oblique Mattress Suture Repair Technique,” Jo, Park, Kang, and Shin⁵ report on clinical outcomes of patients undergoing arthroscopic repair of chronic subscapularis tears using a single-row mattress technique. The authors presented clinical and radiographic data at a minimum of 2 years postop. As such, the authors should be commended for their efforts in collecting and presenting data on an important topic.

The authors retrospectively reviewed 33 patients (mean age, 60.9 ± 10.7) who underwent arthroscopic subscapularis repair and additionally had postoperative magnetic resonance imaging to assess the state of the subscapularis tendon.⁵ As expected, most patients had concomitant tears of the other rotator cuff muscles

(81.8%) or pathology of the long head of the biceps tendon (75.7%) at the time of surgery.⁵ At a mean follow-up time of 26.3 ± 3.5 months, patients had an impressive improvement in both American Shoulder and Elbow Score (mean delta = 29.1; $P < .001$) and Constant score (mean delta = 34.7; $P < .001$).¹ Patients also exhibited a significant improvement in internal rotation at final follow-up ($P < .001$).¹ On repeat magnetic resonance imaging, 4 patients (12.1%) exhibited retear following the single-row oblique mattress technique. Three of the retears were partial, 1 was a full-thickness tear, and 3 had additional tears of the supraspinatus. All 4 of the retear patients were Lacrosse grade IV tears with grade II or more fatty atrophy using the Fuchs classification.¹

The ideal treatment for chronic subscapularis tears remains under debate, especially as the exact pain source is difficult to elicit because of the presence of other nearby structures.⁶ Repair can be difficult, secondary to tendon retraction, scarring, and significant fatty atrophy.^{7,8} However, fixation of the subscapularis can be important for pain and function as well as to reduce the tension when performing a concomitant posterolateral cuff tear.⁸ Despite its potential benefits, there are anatomic and technical challenges. For instance, due to tendon scarring near the coracoid process,⁹ neurovascular injury has been reported during attempted subscapularis mobilization.¹⁰ While an open deltopectoral approach may allow for better visualization,¹⁰ this requires dissection closer to neurovascular structures and limits repair of the posterolateral cuff.

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Single- and double-row techniques have been described.^{11,12} Ide et al.¹² found a retear rate of nearly 35% using a single-row technique, higher than what was found by the authors of the present study.⁵ Double-row fixation has become more recently popular,¹¹ with an emphasis on repairing the native anatomy.¹³ Yoo et al.'s¹³ important work highlighted the subscapularis footprint as well as the "leading edge," which is thought to be the initial tear site of the tendon. A recent biomechanical study from Dyrna et al.¹⁴ investigated placement of a superolateral anchor compared with a standard single row and found significant improvement in footprint coverage along the leading edge with this additional anchor.

In our practice, chronic tears of the subscapularis should always be repaired and concomitant treatment of biceps should occur at the same time. For surgical technique, we feel mobilization of the tendon and preparation of the lesser tuberosity is key to the success of fixation. Scar tissue may hide the tendon in the chronic setting; however, tracing the tendon to its attachment to the coracohumeral and superior glenohumeral ligament can assist in determining the superolateral edge. In addition, cutting the middle glenohumeral ligament can help free the tendon, especially when we feel the repair is under excessive tension. We currently use 2 biocomposite suture anchors to repair the tendon using a horizontal mattress, single-row technique. These are always done in conjunction with a biceps tenotomy or tenodesis or additional rotator cuff repair if needed. While we have not examined the retear rates in our practice using this technique, we feel that regardless of fixation type, not missing concomitant biceps pathology is vital to improve patients' shoulder pain. Despite Jo et al.⁵ demonstrating success with their technique, 32 patients were initially excluded because of their inclusion criteria, which could bias their results. For instance, retear rates may be underreported because the authors chose not to include all full-thickness tears. Overall, we commend the authors for their study and its addition of insight into a not fully understood topic.

Treatment of chronic tears of the subscapularis can be difficult due to scarring and retraction of the tendon. Jo et al. demonstrated clinical and radiographic success using an oblique single-row technique at 2-year follow-up. Future prospective studies are warranted to determine the true success of the technique compared with other fixation methods.

Reference

1. Bennett WF. Subscapularis, medial, and lateral coracohumeral ligament insertion anatomy: Arthroscopic appearance and incidence of "hidden" rotator interval lesions. *Arthroscopy* 2001;17:173-180.
2. Burkhart SS, Tehrany AM. Arthroscopic subscapularis repair: Technique and preliminary results. *Arthroscopy* 2002;18:454-463.
3. Gerber C, Krushell RJ. Isolated rupture of the tendon of the subscapularis muscle: Clinical features in 16 cases. *J Bone Joint Surg Br* 1991;73:389-394.
4. LaFosse L, Reiland Y, Baier GP, Toussaint B, Jost B. Anterior and posterior instability of the long head of the biceps tendon in rotator cuff tears: A new classification based on arthroscopic observations. *Arthroscopy* 2007;23:73-80.
5. Jo Y-G, Park I, Kang J-S, Shin S-J. Clinical outcomes and tendon integrity in patients with chronic retracted subscapularis tear after arthroscopic single-row oblique mattress suture repair technique. *Arthroscopy* 2019;35:1973-1981.
6. Taylor SA, Newman AM, Dawson C, et al. The "3-pack" examination is critical for comprehensive evaluation of the biceps-labrum complex and the bicipital tunnel: A prospective study. *Arthroscopy* 2016;33:28-38.
7. Burkart SS, Morgan CD, Kibler WB. The disabled throwing shoulder: Spectrum of pathology Part I: Pathoanatomy and biomechanics. *Arthroscopy* 2003;19:404-420.
8. Park JY, Chung SW, Lee SJ, et al. Combined subscapularis tears in massive posterosuperior rotator cuff tears: Do they affect postoperative shoulder function and rotator cuff integrity? *Am J Sports Med* 2016;44:183-190.
9. Burkhart SS, Brady PC. Arthroscopic subscapularis repair: Surgical tips and pearls A to Z. *Arthroscopy* 2006;22:1014-1027.
10. Lo IKY, Burkhart SS, Parten PM. Surgery about the coracoid: Neurovascular structures at risk. *Arthroscopy* 2004;20:591-594.
11. Ide J, Karasugi T, Okamoto N, Taniwaki T, Oka K, Mizuta H. Functional and structural comparisons of the arthroscopic knotless double-row suture bridge and single-row repair for anterosuperior rotator cuff tears. *J Shoulder Elbow Surg* 2015;24:1544-1554.
12. Ide J, Tokiyoshi A, Hirose J, Mizuta H. Arthroscopic repair of traumatic combined rotator cuff tears involving the subscapularis tendon. *J Bone Joint Surg Am* 2007;89:2378-2388.
13. Yoo J-C, Rhee YG, Shin S-J, et al. Subscapularis tendon tear classification based on 3-dimensional anatomic footprint: A cadaveric and prospective clinical observational study. *Arthroscopy* 2015;31:19-28.
14. Dyrna F, Beitzel K, Pauzenberger L, et al. A superolaterally placed anchor for subscapularis "leading-edge" refixation: A biomechanical study. *Arthroscopy* 2019. <https://doi.org/10.1016/j.arthro.2018.11.060>.