

Arthroscopic Reconstruction of Isolated Subscapularis Tears: Clinical Results and Structural Integrity After 24 Months

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Purpose: The purpose of this study was to evaluate the magnetic resonance imaging (MRI) and clinical results of arthroscopic repair of isolated subscapularis tears at 24 months' follow-up. **Methods:** We prospectively followed up 20 patients with isolated subscapularis tears treated with arthroscopic repair with suture anchors in a 3-year period (January 2006 to December 2008) at our institution. Clinical examination of the patients and functional scores (Constant and University of California, Los Angeles [UCLA] scores) were obtained preoperatively and at 6 months, 12 months, and 24 months postoperatively. MRI and routine radiographs were obtained to evaluate the repair at the last follow-up. **Results:** Of the patients (mean age, 42 years; age range, 31 to 56 years), 19 (95%) had complete follow-up. Constant and UCLA scores improved significantly after the repair at all postoperative examinations. The Constant score gained 39.7 points to a mean of 81 points (range, 61 to 95 points) at last follow-up, and the UCLA score improved from 16 points to 32 points (range, 25 to 35 points). Of the shoulders, 13 had a concomitant lesion of the long head of the biceps; 12 were treated with biceps tenodesis. At last follow-up, there were 2 retears detected by both MRI and examinations (positive belly-press and liftoff tests). Seventeen patients were satisfied with their results at 24 months postoperatively. **Conclusions:** Arthroscopic repair of isolated subscapularis tendon tears is an effective technique with good-to-excellent clinical and functional results. **Level of Evidence:** Level IV, therapeutic case series.

Subscapularis tears may present as part of a massive anterosuperior rotator cuff tear¹⁻³ or as isolated lesions.⁴⁻⁶ Isolated subscapularis tendon tears are rare and occur with a reported incidence of 4% among all rotator cuff tears.⁷ Subscapularis tears are the result of trauma when the arm resists an external rotation

force when the shoulder is abducted and externally rotated.

Although there are many clinical tests for subscapularis tendon integrity, some tears may not be diagnosed by preoperative physical examination. Furthermore, smaller and/or partial tears are often missed on advanced imaging studies, such as magnetic resonance imaging (MRI).^{8,9} The vast majority (>90%) of subscapularis tendon tears start on the intra-articular, cephalad aspect of the tendon insertion, and thus an arthroscopic intra-articular evaluation is required to make the definitive diagnosis of these tears.^{2,9} The inferior extent of the tear cannot be assessed from an intra-articular view, because the lower two-thirds of the tendon is covered by the joint capsule, so it is necessary to visualize this area from the bursal side.

Many studies have shown acceptable clinical outcomes with open treatment of isolated subscapularis tendon tears,^{4,6,10,11} but there have only been a few

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clinical studies reporting on arthroscopic treatment of these tears. These studies vary in their treatment, from debridement in selected patients⁷ to repair with suture anchors.¹²⁻¹⁶

The purpose of this study was to prospectively evaluate the clinical results of arthroscopic repair of isolated subscapularis tears with suture anchors after a follow-up of 24 months, and MRI scans were used to evaluate the structural integrity of the repair. The hypothesis of this study was that arthroscopic repair of isolated subscapularis tears would yield significant objective and subjective improvement at 24 months' follow-up.

METHODS

Twenty patients with isolated subscapularis tears treated with arthroscopic repair were studied prospectively for 24 months. The incidence of this lesion was 4.1% among all 488 cuff repairs performed in a 3-year period (January 2006 to December 2008) at our institution. Informed consent was given by all the patients, and the institutional ethics committee of our hospital approved the study protocol. Patients who had tears extending to the supraspinatus tendon or partial tears (Lafosse type 1) were not included in this study.

Preoperative Evaluation

A thorough history was obtained for each patient, including mechanism of injury (if any), duration of symptoms, and arm dominance. Range of active motion including flexion, extension, abduction, adduction, and internal and external rotation was recorded for both shoulders. The Neer and Hawkins impingement signs, as well as tenderness on the lesser tuberosity and bicipital groove, were recorded. The Yergason and Speed tests were used to identify concomitant pathology of the tendon of the long head of the biceps brachialis.¹⁷ Subscapularis tendon integrity was assessed with liftoff and modified belly-press tests.^{6,8} Pain was assessed with a visual analog scale.

All patients were evaluated with the Constant and Murley scoring system,¹⁸ as well as the University of California, Los Angeles (UCLA) scoring system.¹⁹

Anteroposterior, transaxial, and outlet-view radiographs were obtained for all patients to evaluate the presence of glenohumeral osteoarthritis according to the criteria of Samilson and Prieto.²⁰ All patients had an MRI examination,⁹ and fatty infiltration of the subscapularis muscle was classified according to the classification of Goutallier et al.²¹

Arthroscopic Treatment

All patients were treated with arthroscopic repair of the tear while under general anesthesia and placed in the lateral decubitus position. The arm was suspended with longitudinal traction of 5 kg. In all cases a diagnostic arthroscopy with a 30° arthroscope was performed through a standard posterior portal. We also used anterior, anterolateral, and accessory anterolateral portals. It is necessary to use a lateral or anterolateral portal as the viewing portal to be able to fully mobilize and repair the subscapularis tendon, because it is not possible to “look around the corner” to work in an area medial to the glenoid rim. In partial subscapularis tears, the posterior portal was used as the viewing portal for an all intra-articular repair. At least 2 anterior portals are necessary to repair a complete subscapularis tear, serving as working portals for accurate placement of the anchors, suture manipulation, preparation of the bone bed, mobilization of the tendon, and traction suture placement (Fig 1).²² Concomitant pathology of the long head of the biceps (partial tears, instability) was evaluated and treated with tenodesis. One to three bone anchors loaded with 2 sutures were used for fixation of the subscapularis tendon to the lesser humeral tubercle in a single-row configuration (Fig 2). Shoulders presenting with a partial tear or instability of the long head of the biceps were treated with biceps tenodesis. If tenodesis of the long head of the biceps was indicated, it was performed by the lasso-loop technique,²³ with 1 suture of 1 double-loaded anchor placed proximal to the bicipital groove and with the remaining suture used for the subscapularis repair.

It is necessary to adequately mobilize the tendon if any degree of retraction is present (Fig 3). Tears with

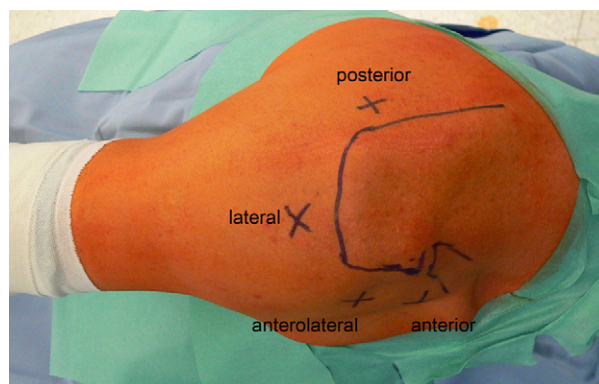


FIGURE 1. Arthroscopic portals used for subscapularis repair, shown in a right shoulder in the lateral decubitus position.

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