



ELSEVIER

ORIGINAL ARTICLE

Ten-year clinical and anatomic follow-up after repair of anterosuperior rotator cuff tears: influence of the subscapularis

Laurent Nové-Josserand, MD^{a,*}, Philippe Collin, MD^b, Arnaud Godenèche, MD^a, Gilles Walch, MD^a, Nicolas Meyer, MD, PhD^c, Jean-Francois Kempf, MD, PhD^d, for The SOFCOT^e

^aCentre Orthopédique Santy—Hôpital Privé Jean Mermoz, Lyon, France

^bCentre Hospitalier Privé Saint Grégoire Vivalto Santé, Saint Grégoire, France

^cService de Santé Publique, Centre Hospitalier Régional Universitaire de Strasbourg, Strasbourg, France

^dCentre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden, France

^eSociété Française de Chirurgie Orthopédique et Traumatologique, Paris, France

Background: Anterosuperior rotator cuff tears are more frequent than expected. We report the results of a 10-year follow-up study after repair. Our hypothesis was that the extent of the subscapularis tear influenced the prognosis.

Materials and methods: The study population consisted of all 138 patients who underwent surgery in 14 participating centers in 2003 for full-thickness tears of the rotator cuff with lesions in the subscapularis and supraspinatus tendons. The patients were divided into 2 groups, depending on whether the subscapularis lesion affected only the superior half of the tendon (group A) or extended into the lower half (group B). Ninety-two patients (56 ± 7 years; 71 in group A and 21 in group B) were available for follow-up after 10 years (127 ± 16 months) with magnetic resonance imaging to evaluate tendon healing and muscle condition.

Results: The mean Constant scores were 59 ± 16 before surgery and 77 ± 14 at follow-up ($P = 1.7 \times 10^{-12}$). The retear rates were 25% for the supraspinatus and 13.5% for the subscapularis tendon. The clinical results for group A patients were better than those for group B. Severe fatty infiltration was observed more frequently in the subscapularis than in the supraspinatus muscle (27% vs. 12% of cases). Supraspinatus healing influenced subscapularis healing and fatty infiltration.

Conclusions: Repair of anterosuperior rotator cuff tears is satisfactory at 10 years, particularly if the subscapularis tear is not extensive. An extensive subscapularis tear is a negative prognosis factor. Postoperatively, fatty infiltration of the subscapularis muscle was frequently observed despite tendon healing.

Level of evidence: Level III; Retrospective Cohort Design; Treatment Study

© 2017 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.

Keywords: Shoulder; rotator cuff; anterosuperior; long-term follow-up; repair; supraspinatus; subscapularis; fatty infiltration

CNIL (Commission Nationale Informatique et Liberté) approved this study: No. DR-2015-021.

*Reprint requests: Laurent Nové-Josserand, MD, Centre Orthopédique Santy—Hôpital Privé Jean Mermoz, 24 Avenue Paul Santy, F-69008 Lyon, France.

E-mail address: lnovejosserand.md@orthosanty.fr (L. Nové-Josserand).

Rotator cuff tears involving isolated lesions in the subscapularis tendon are rare,^{14,23} whereas those associated with superior cuff tears are frequent.^{20,32,38} Studies of surgical repair for anterosuperior cuff tears^{2,3,18,19,24,27,34} report satisfactory clinical outcomes—nonetheless with a residual weakness²—at an average follow-up of between 15 months and 6 years. The influence on prognosis of the extent of the lesions, particularly those of the subscapularis, is a matter of debate.^{2,18,24,27} Collin et al⁷ have suggested classifying rotator cuff tears into 2 groups, depending on the nature of the anterior lesions. They associated the more severe clinical presentation, when the subscapularis lesion reaches the inferior half of the humeral insertion, with a high risk of pseudoparalytic shoulder.⁷ They did not, however, come to any conclusion about the prognosis after tendon repair.⁷

Long-term studies of the outcome of rotator cuff repair, 10 years or more after surgery, are sparse in the literature. Clinical results after open surgery for superior cuff lesions are often reported as satisfactory and stable over time.^{1,6,12,16,25,26,39} From an anatomic point of view, Goutallier et al reported intact tendon healing and stable clinical results at a mean follow-up of 9 years.¹⁶ Zumstein et al³⁹ found an increased number of iterative tears with no clinical impact after operative repair of massive posterolateral cuff tears. The results of subscapularis tendon repairs are well documented,^{14,21,29} but with a mean follow-up of between 29 and 43 months.

Here, we report the clinical and anatomic results of a multicenter retrospective study, with a long-term (10-year) follow-up by magnetic resonance imaging (MRI), of a series of associated lesions in the supraspinatus and subscapularis tendons. Our hypothesis was that the outcome depended on the extent of the subscapularis lesion. According to the classification of Collin et al,⁷ patients with larger subscapularis tears (more than half the length of the tendon) have a poorer prognosis than those for whom the tear is confined to the superior half of the tendon.

Materials and methods

Study population

This study involved the follow-up after at least 10 years of rotator cuff repairs performed in 15 surgical centers. The inclusion criteria were that (1) all operations were performed in 2003 for full-thickness tears of the rotator cuff with lesions in the subscapularis and supraspinatus tendons, (2) watertight tendon repair was considered complete by the surgeon regardless of the method employed, and (3) patients were available for a clinical follow-up, with or without MRI, after at least 10 years. Partial lesions of the supraspinatus tendon, partial or incomplete repairs, prior surgery on the same shoulder, and inflammatory conditions were all excluded.

In total, 138 patients (41 women, 97 men; mean age at surgery, 56.8 ± 8.5 years; 138 shoulders) underwent surgical repair for torn supraspinatus and subscapularis tendons exclusively, the other tendons in the rotator cuff being unaffected. Eight patients required repeat surgery within 10 years and were excluded from this analysis

of tendon repair. The additional operations were to release stiffness (1 case), iterative repair (3 cases), and a reverse shoulder prosthesis (3 cases); in 1 case, the type of operation performed was not specified. Another 38 patients were lost to follow-up because of death (6 patients), unwillingness to return for the follow-up appointment for medical or geographic reasons or other reasons (7 patients), or inability to be located (25 patients), leaving a cohort of 92 patients for analysis (70 men, 22 women; mean age at surgery, 56 ± 7 years). Following the classification of Collin et al,⁷ patients with lesions in only the superior half of the subscapularis tendon were classed in group A (n = 71); those with lesions extending into the lower half of the tendon were classed in group B (n = 21). For 37 cases, the subscapularis lesion was very small and was graded as partial by the surgeon at the time of surgery; 21 of these were not repaired. All patients gave informed written consent.

Functional and radiologic assessments

At follow-up, subjective shoulder values (SSVs) were recorded, with patients asked to assess their shoulder function as a percentage of that of a normal shoulder.¹³ Function was also evaluated using the Constant-Murley score,⁸ adjusted for the sex and age of the patient and expressed as a percentage. The corresponding preoperative score was available for 67 patients. Preoperative tendon tests are not reported because these differed widely between the participating surgical centers.

Radiographs of the shoulder were taken in anteroposterior view with double-obliquity projections before surgery and at follow-up. The subacromial space—the distance between the inferior cortex of the acromion and the humeral head—was measured in millimeters. The presence of glenohumeral arthritis was assessed using Samilson-Prieto grades I to IV.³³ These radiologic factors were used to grade the tears before surgery and at follow-up using the Hamada-Fukuda classification.¹⁷

The follow-up MRI examination involved transverse and sagittal T1-weighted sequences focusing on muscle tissue and T2-weighted fat-suppressed sequences in the coronal oblique, sagittal oblique, and transverse planes to analyze the repaired tendons. Follow-up MRI data were available for 77 shoulders, some patients having refused the examination. The MRI studies were interpreted by 4 independent physicians, namely, 1 junior and 2 experienced surgeons and 1 experienced radiologist. The healing of the supraspinatus and infraspinatus tendons was graded according to Sugaya's classification.³⁵ In keeping with Sugaya,³⁵ we classed type I to III tendons as healed, irrespective of their aspect, and types IV and V as either an iterative tear or a failed healing response. Regarding the subscapularis, we classed the tendon as either healed if it appeared continuous in the horizontal cuts or not healed if a discontinuity was observed, regardless of its size or location.

We graded the fatty infiltration of the rotator cuff muscles in Fuchs stages,¹¹ which are based on Goutallier's classification.¹⁵ Fuchs stage A corresponds to Goutallier stages 0 (no intramuscular fat) and 1 (some fatty streaks) and is considered normal. Fuchs stage B (Goutallier stage 2) is considered pathologic, with fat evident, but less fat than muscle tissue. Fuchs stage C corresponds to substantial fatty infiltration, with equal amounts of fat and muscle (Goutallier stage 3), or severe (Goutallier stage 4), with more fat than muscle tissue.

The size of the tendon tear was assessed during surgery, in comparison with the preoperative imaging results when available

Download English Version:

<https://daneshyari.com/en/article/8801201>

Download Persian Version:

<https://daneshyari.com/article/8801201>

[Daneshyari.com](https://daneshyari.com)