

ARTHROSCOPIC SINGLE-ANCHOR REPAIR OF ISOLATED SUBSCAPULARIS TENDON TEARS – RESULTS AFTER TEN YEARS FOLLOW-UP

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Abstract

The subscapularis muscle is the strongest and largest from the rotator cuff complex and provides over half of its strength. However, isolated subscapularis tendon tears are more frequently reported nowadays. With comparable outcomes to open surgery and a low complications rate, arthroscopic repair of these lesions is being utilized more often. Additionally, authors describe different techniques with similar results.

The aim of this study was to discover the long-term results of arthroscopic single-anchor repair of isolated subscapularis tendon tears.

This is a single-centre retrospective study involving 41 patients with isolated subscapularis tendon tears. All the participants underwent arthroscopic single-anchor repair and were re-evaluated after 121 ± 2 months. Demographic data, functional scores, complications rate, re-tear rate, and reoperations were recorded. Statistical analysis was performed.

The study involved 24 male patients (58.5%). Ninety-three percent of the patients were over 52 years old (range 49–63). The University of California Los Angeles (UCLA) scores improved from 13.7 ± 2 preoperatively to 30.2 ± 1 postoperatively ($p < 0.05$). The American Shoulder and Elbow Surgeons (ASES) scores changed from 38.1 to 88.5 ($p < 0.05$). Complications rate was 4.8% with two patients undergoing a total shoulder replacement surgery 89 and 101 months postoperatively.

Arthroscopic single-anchor repair is a safe and viable option for treating isolated subscapularis tendon tears. The procedure has shown good to excellent results with high rates of patient satisfaction, decreased pain, and improved function after long-term follow-up.

Key words: shoulder, arthroscopy, subscapularis tendon, anchor repair

Introduction. The subscapularis muscle is the strongest and largest from the rotator cuff complex and provides over half of its strength [?]. It stabilizes the shoulder anteriorly, and is involved in balancing force couples of the glenohumeral joint.

Subscapularis muscle tears are reported up to 37% prevalence among patients undergoing shoulder arthroscopy [?]. Due to the advancements in arthroscopic surgery and imaging modalities, the identification of these lesions is thought to be improved, although they still remain relatively uncommon and represent approximately 10% to 25% of subscapularis tendon lesions in most series [?]. Isolated subscapularis tendon tears are more frequently reported nowadays – up to 49% [?, ?, ?].

With comparable outcomes to open surgery and a low complications rate, arthroscopic repair of these lesions is being utilized more often [?]. Additionally, authors describe different techniques depending on the tear grade – single and double-row anchor/transosseous repair.

The aim of this study was to discover the long-term results of arthroscopic single-anchor repair of isolated subscapularis tendon tears.

Materials and methods. A single-centre retrospective study was conducted. Informed consent was taken from all the participants. Inclusion and exclusion criteria were defined. The LAFOSSE classification was routinely used to grade the lesions [?]. Only patients with Lafosse grade 1 and 2 were included. Forty-one patients with isolated subscapularis tendon tears were selected for the study (Fig. 1).

All the participants underwent arthroscopic single-row anchor repair (Fig. 2). The postoperative protocol was standard – 3 to 4 weeks bracing, followed by rehabilitation protocol.

The patients were re-evaluated in the outpatient clinic. Clinical tests were performed – the lift-off test, the belly-press test, and the bear-hug test [?, ?, ?]. The University of California Los Angeles (UCLA) score and the American Shoulder and Elbow Surgeons (ASES) score were taken. Demographic data, complications rate, re-tear rate, and reoperations were also recorded. Statistical analysis was performed using Microsoft Excel 2019 and the Real Statistics Resource Pack for Excel 2019, Release 7.7.1.

Results. The study involved 24 male patients (58.5%). Ninety-three percent of the patients were over 52 years old (range 49–63). The mean BMI was 29.1 ± 3.3 kg/m². The mean follow-up time was 121 ± 2 months.

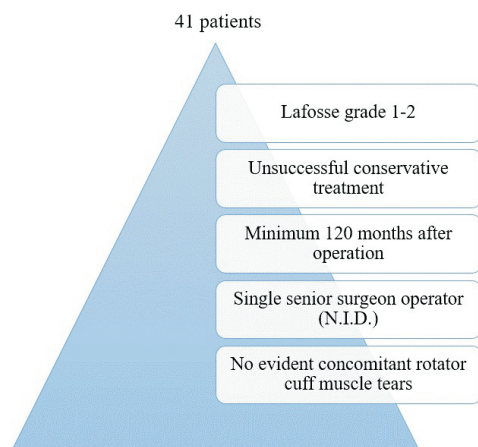


Fig. 1. Patient inclusion criteria ($n = 41$)

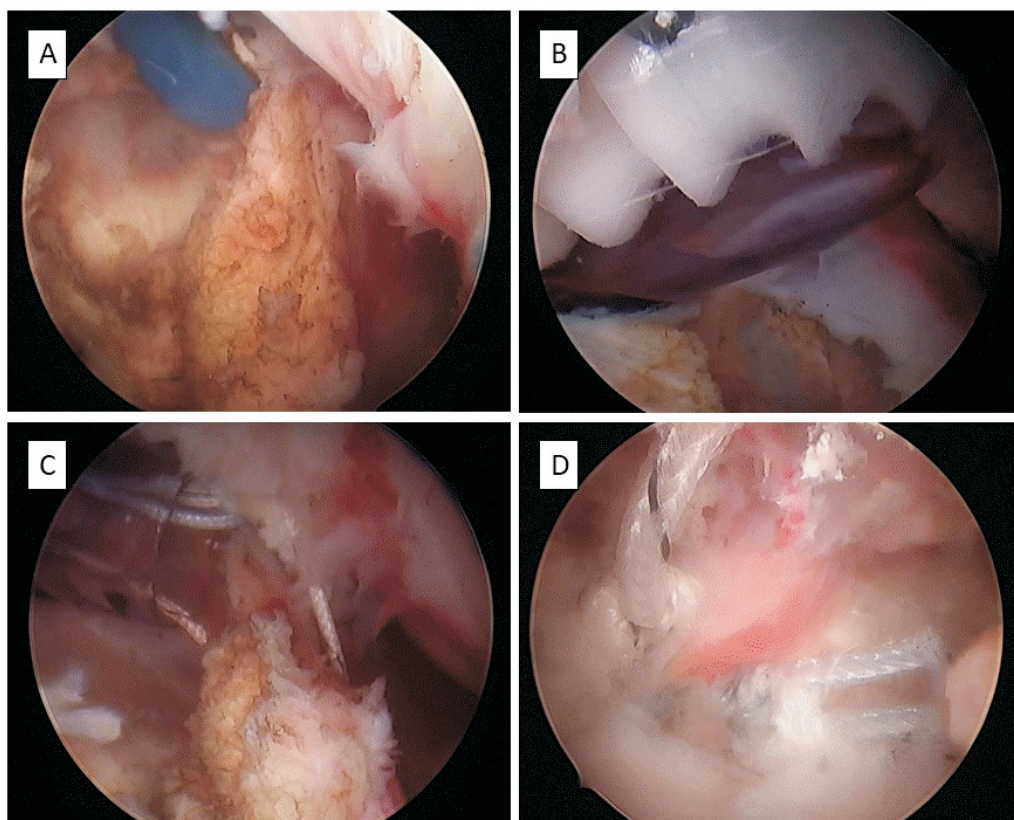


Fig. 2. Arthroscopic technique involving tear recognition and liberation (A), placement of the anchor (B), suturing the torn portion of the subscapularis (C), and single-row repair (D)

Physical examination showed no tenderness/pain with subscapular palpation, and no increased passive external rotation. No pain with anterior elevation and internal rotation was recorded. Persistent positive lift-off tests were reported for 8 (20%) patients. Persistent positive belly-press tests were reported for 6 (15%) patients.

The University of California Los Angeles (UCLA) scores improved from 13.7 ± 2 preoperatively to 30.2 ± 1 postoperatively ($p < 0.05$). The American Shoulder and Elbow Surgeons (ASES) scores changed from 38.1 to 88.5 ($p < 0.05$) (Table 1).

T a b l e 1
Paired T-test statistics. SE, standard error

	Mean	SD	SE Mean	t	Df	Sig. (2-tailed)
Preoperative UCLA – Postoperative UCLA	16.511	1.554	0.922	32.288	41	.000
Preoperative ASES – Postoperative ASES	50.488	4.488	1.223	12.476	41	.000

Complications rate was 4.8% with two patients undergoing a total shoulder replacement surgery 89 and 101 months postoperatively. The re-tear rate was 4.8% with two patients needing reoperation.

Discussion. The most important finding of this study is the fact that at ten years (121 ± 2 months) follow-up the functional results are good to excellent according to ASES and the UCLA tests, as well as the clinical tests with high patient satisfaction levels. The complications rate is relatively low, part of this is thought to be because of the initial lower grade tear of the muscle (Lafosse 1-2). We decided to pick the single-row anchor technique and to discover the long-term follow-up results as there are studies which suggest a more reliable technique (the double row repair) in cases of isolated subscapularis tears. The double-row repair has shown its superiority in terms of lower complications rate, anatomical restoration, and recovery rates. However, these repair types may be more suitable for higher grade and posterosuperior tears (Lafosse 3-4) [?, ?, ?].

The re-tear rate in this study is about 5% and is comparable to other authors in the literature [?, ?]. Lafosse et al. [?] explained the higher rate of re-tear by the use of single-row instead of double-row. The results from articles that describe double-row repair are comparable in terms of re-tear rate.

The influence of fatty degeneration in isolated subscapularis tears is often overlooked. We did not follow-up on this aspect as NOVÉ-JOSSERAND et al. [?] showed that progression of fatty infiltration did not alter the clinical outcomes. Nonetheless, more research is needed on this topic.

Another controversial aspect is the subcoracoid impingement and whether or not it affects the pathogenesis and treatment of subscapularis lesions. We did not

perform subcoracoid decompression, but some authors prefer to [?]. Additionally, LANZ et al. [?] found no difference in coracohumeral distance preoperatively and postoperatively in cases of arthroscopically treated subscapularis tears.

The indications for double versus single-row repair for isolated subscapularis tears continues to be an interesting topic with future research potential – a more precise distinction is perhaps needed (not only depending on the tear pattern).

Conclusion. Arthroscopic single-anchor repair is a safe and viable option for treating isolated subscapularis tendon tears. The procedure has shown good to excellent results with high rates of patient satisfaction, decreased pain, and improved function after long-term follow-up.

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