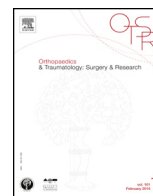




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Original article

Postoperative pain after arthroscopic versus open rotator cuff repair. A prospective study



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ABSTRACT

Introduction: Although the arthroscopic technique is becoming the gold standard for rotator cuff tendon repair, there is no proof that this technique results in less postoperative pain compared to open repair. The aim of this study was to prospectively compare the postoperative pain level after arthroscopic or open rotator cuff repair and to define factors that could influence its course.

Materials and methods: Between January 2012 and January 2013, 95 patients were operated for a rotator cuff tear: 45 using an arthroscopic technique and 50 an open technique. Daily analgesic use and self-evaluation of pain level using a visual analogic scale were recorded preoperatively and twice a day postoperatively during the first 6 weeks. These data were compared between the two groups and analyzed according to patients' demographic data and preoperative evaluation of the tear.

Results: The preoperative pain level was equivalent in the two groups ($P=0.22$). Postoperatively, level-2 analgesic medication use was greater in the arthroscopic group after the 4th week ($P=0.01$). A pain-free shoulder was obtained before the 6th week in 75% and 66% of the patients after arthroscopic or open repair, respectively ($P=0.34$). There was a positive correlation between the preoperative and postoperative pain level ($r=0.25$; $P=0.02$). Work compensation patients experienced more pain postoperatively ($P=0.08$). Level-III analgesic medication use was greater for patients with massive rotator cuff tear ($P=0.001$).

Conclusion: No evidence was found on the superiority of arthroscopy versus open repair of rotator cuff tear concerning the postoperative pain level. The choice of the surgical technique should not be based on this argument.

Level of evidence: II.

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1. Introduction

Since Codman's first description in 1911 [1] of a rotator cuff tear repair technique, different studies have reported satisfactory clinical results in 70–95% of cases after open tendon reinsertion, with a 45–90% healing rate [2–15]. Since the advent of arthroscopy, endoscopic repairs of rotator cuff tendon lesions have been widely studied [16–21]. Postoperative comfort in terms of pain symptoms, notably the absence of muscle disinsertion, seems to be one of the arguments orienting the surgeons' choice toward arthroscopic repairs. However, few comparative studies have precisely assessed the functional results between these two techniques, notably in terms of postoperative pain.

The objective of the present study was to prospectively compare immediate postoperative pain after arthroscopic and open rotator cuff repair and to determine the factors influencing this parameter. We hypothesized that arthroscopic repair of the rotator cuff would lead to less postoperative pain than open repair.

2. Material and methods

A prospective, consecutive, single-center study was conducted in our university orthopaedics-traumatology department from January 2012 to January 2013. The study included all patients who underwent surgical repair of the rotator cuff associated with acromioplasty and tenotomy or tenodesis of the long head of biceps tendon. The repair was either arthroscopic (group A) or performed with an open technique (group O), non randomized, performed by two experienced operators in these techniques: NB for group A and PM for group O. Patients with a history of rotator cuff repair

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Table 1
Characteristics of the population of the two groups studied.

	Arthroscopy	Open	P-value
Mean age (years)	55 (37–72)	60 (43–78)	0.001
Females	37.5%	44.7%	0.323 [*]
Trauma context	37.5%	38.3%	0.558 [*]
Work accident or occupational disease	20%	17%	0.466 [*]
Moderate or heavy manual labor	62.5%	48.9%	0.146 [*]
Dominant side	82.5%	63.8%	0.043
Active smoking	20%	21.3%	0.549 [*]

^{*} $P > 0.05$: no significant difference.

in the same shoulder were excluded, as were those who had not undergone acromioplasty or bicipital surgery or those presenting associated pathologies.

2.1. Comparability of the groups

Ninety-five patients underwent rotator cuff repair, 45 arthroscopic repair and 50 with the open technique. The mean age was 55 years (range: 37–72 years) in group A and 60 years (range: 43–78 years) in group O. The mean hospital stay was 2.2 days in group A and 3.5 days in group O ($P = 0.001$). Groups A and O were comparable in terms of gender, the trauma context, the occupational accident or occupational disease context, moderate or heavy manual labor, the dominant side injured, and active smoking (Table 1). The distribution of tendon involvement (type, retraction, extension) is summarized in Table 2. In group A, there were 10 partial tears greater than 50% of the tendon thickness, eight of which were on the deep side and two on the superficial side. No partial-thickness lesions were found in group O. There were more stage 1 non-retracted lesions in the arthroscopic group. The two groups were comparable in terms of the number of tendons injured.

2.2. Surgical techniques

All the patients included were given preoperative interscalene block in a single injection of ropivacaine 7.5 mg/mL (20 mL) or in a single injection of ropivacaine 7.5 mg/mL (20 mL) and dexamethasone 4 mg or associated with placement of a perineural catheter with an initial injection of ropivacaine 7.5 mg/mL (20 mL), then continuous postoperative perfusion of ropivacaine 2 mg/mL to 5 mL/h, associated with on-demand boluses. The catheter was removed 48 h after surgery [22,23]. The choice of perioperative analgesics was made by the anesthesiologist.

The patient was installed in the semi-sitting position. The lesion was assessed intraoperatively either with arthroscopy in group A or in the open procedure in group O. The frontal extension of the lesion was evaluated in three stages according to Patte [24].

Table 2
Distribution of rotator cuff tendon lesions between the two groups studied.

	Arthroscopy n = 45	Open n = 50	P-value
<i>Lesion</i>			
Full-thickness	35	50	0.001
Partial-thickness	10	0	
<i>Retraction</i>	n = 35		
Stage 1	25	23	0.001
Stage 2	8	22	
Stage 3	2	5	
<i>Number of tendons injured</i>			
1	21	23	0.35
2	22	23	
3	2	4	

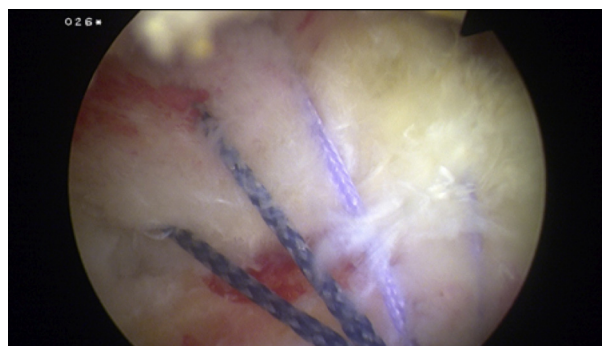


Fig. 1. Tension-band suture technique.

2.3. Arthroscopic technique

No traction system was used and manual traction was used as needed. The intervention began with glenohumeral joint exploration. An intra-articular tenotomy of the long head of biceps tendon (LHBT) was performed at the supraglenoid tubercle. In cases undergoing tenodesis, the transverse humeral ligament was resected after anterior bursectomy, and tenodesis of the LHBT was carried out in the bicipital groove using a bioabsorbable screw anchorage system or a bioabsorbable interference screw. An acromioplasty was performed via the posterior approach using a motorized reamer after complete bursectomy and resection of the coracoacromial ligament. The rotator cuff was repaired using the tension band technique. Mattress sutures mounted on a resorbable screw anchorage system were performed (Fig. 1). Depending on the extent of the injury, a technique using a double row of anchors was sometimes used [25]. In cases with partial-thickness tear, release and then reinsertion following the same tension band technique was performed.

2.4. Open technique

The superior approach with an incision measuring 4–5 cm was used (Fig. 2). The deltoid muscle was incised following the muscle fibers between the anterior and middle bundles. The coracoacromial ligament was resected and then, an anterior and inferior acromioplasty was performed with a chisel. The rotator cuff was explored after a bursectomy. The rotator interval was opened to explore the LHBT and the tendon of the subscapularis muscle



Fig. 2. Superior approach.

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