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ORIGINAL ARTICLE

Outcomes of two surgical revision techniques for recurrent anterior shoulder instability following selective capsular repair

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KEYWORDS
Shoulder instability;
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Summary
Introduction: Conventional capsulolabral reconstruction for anterior shoulder instability fails with recurrent instability in up to 23% of cases. Few studies have evaluated surgical revision strategies and outcomes. The objective of this study was to evaluate clinical and radiographic outcomes in a homogeneous series of surgical revisions after selective capsular repair (SCR).
Hypothesis: Observed anatomic lesions can guide the choice between repeat SCR and coracoid transfer (Latarjet procedure).
Materials and methods: From January 2005 to January 2009, 11 patients with trauma-related recurrent anterior shoulder instability (episodes of subluxation and/or dislocation) after SCR were included. Mean age was 31 years (range, 19—45 years). At revision, a glenoid bony defect was present in six patients. Repeat SCR was performed in five patients and coracoid transfer in six patients.
Results: After a mean follow-up of 40 months (range, 24—65 months), no patient had experienced further episodes of instability. However, four patients had a positive apprehension test. External rotation decreased significantly by more than 20° after both techniques. The Simple Shoulder Test, Walch-Duplay, and Rowe scores were 10.5, 79, and 85, respectively. No patient had a subscapularis tear. Of these 11 patients, nine were able to resume their sporting activities and eight reported being satisfied or very satisfied with the subjective outcome. Radiographs showed fibrous non-union of the coracoid transfer in one patient.
Conclusion: In patients with recurrent anterior shoulder instability after SCR, repeat SCR and coracoid transfer produce similarly satisfactory outcomes. The size of the glenoid bone defect may be the best criterion for choosing between these two procedures. However, open revision surgery may decrease the range of motion, most notably in external rotation.
Level of evidence: Level IV.

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Introduction

Open reconstruction of the capsule and labrum in patients with antero-inferior shoulder instability is followed by recurrent instability in 3 to 23% of cases [1—6]. Factors that influence this failure rate may include patient characteristics (age and type and level of sports activities) and the anatomic lesions (bony defects in the glenoid and humerus and quality of the capsule). Open surgery is classically recommended in patients with recurrent instability, although arthroscopic surgery may have the dual advantage of preserving the subscapularis tendon and permitting an accurate intraoperative assessment of the anatomic lesions [7—12]. With both open and arthroscopic techniques, repeat capsulolabral reconstruction seems to produce poorer outcomes compared to primary surgery [10—14].

The objective of this study was to assess midterm outcomes of revision surgery for recurrent instability in a homogeneous series of patients previously managed with selective capsular repair (SCR).

Material and method

Inclusion and exclusion criteria

We conducted a single-centre retrospective study of patients who underwent revision surgery for recurrent anterior shoulder instability after SCR between January 2005 and January 2009. Only patients for whom clinical and radiographic data were available at least 24 months after the revision procedure were included.

We excluded patients with recurrent instability within 6 weeks after primary SCR, shoulder pain without clearly documented instability episodes, or postero-superior rotator cuff lesions.

All patients gave their written informed consent to the use of data regarding their surgical management for a scientific study.

Demographic data and choice of the revision technique

We included 11 patients, nine men and two women with a mean time from primary SCR to recurrence of 33 months (range, 7—84). The right shoulder, which was the dominant side, was involved in six patients. The recurrence was consistently caused by a trauma, which was moderate in five cases and major in six cases (sustained while playing a contact sport in five patients and during a motor vehicle accident in one patient).

The revision technique was selected based on the preoperative evaluation of bony lesions by computed tomography (CT)-arthrography and standard radiography (anteroposterior view in external, neutral, and internal rotation and lateral view of the glenoid [Bernageau's view]). A bony defect in the glenoid was the main criterion for performing a coracoid transfer procedure and was present in six patients. Repeat SCR was performed in the remaining five patients.

Table 1 lists the demographic characteristics and preoperative anatomic lesions in the 11 included patients.

Surgical technique

All 11 procedures were performed by the same senior surgeon (MM).

The patient was supine with the head on a pad and the upper body in 20° of flexion. The shoulder was examined under general anaesthesia and interscalenic block to confirm the direction of the instability, passive range of motion, and magnitude of anteroposterior humeral head translation. The delto-pectoral approach was re-opened and an L-shaped incision was made in the subscapularis tendon taking care to spare the deep capsular layer and lower muscle fibres [16].

For repeat SCR, the capsule was opened vertically on the humeral side, 5 to 10 mm medial to the lateral subscapularis tendon stump. The arthrotomy incision extended from the rotator cuff interval to the lower edge of the humeral head, parallel to the anatomic neck. The intra-articular lesions were evaluated and appropriate procedures were performed to treat all abnormalities: recurrent labral lesions were reattached using absorbable anchors (Panalok RC®, De Puy Mitek, Raynham, MA, USA) and the capsule was tightened as described by Neer and Foster [17].

For coracoid transfer, the coracoid process was osteotomised at its knee with a continuous 1-cm fragment of the coraco-acromial ligament. The capsule was opened vertically on the glenoid side, along the anterior glenoid rim. The damaged labrum was removed, the neck of the scapula freshened, and the coracoid transplant secured with a single 4.5-mm compression screw laid flat in a subequatorial position. A routine check was performed to ensure that the coracoid transplant did not overhang the glenoid rim. The joint capsule was closed and reinforced using the coraco-acromial ligament stump, without inducing retightening [18].

At the end of the procedure, the subscapularis tendon was sutured in the anatomic position using separate stitches and non-absorbable braided sutures.

The postoperative rehabilitation programme was identical after SCR and after coracoid transfer. The elbow was immobilised at the side for 6 weeks to protect the subscapularis tendon re-attachment. Pendulum exercises were started on the first postoperative day. Self-passive mobilisation in the plane of the scapula under supervision by a physical therapist was started at week 2, without external rotation beyond the neutral position. Starting at week 6, range of motion in all planes was recovered gradually. External rotation with the elbow at the side was limited to 60° until week 12, when muscle-strengthening exercises and participation in non-contact sports were started. Contact sports were not allowed until month 5.

Preoperative and postoperative evaluations

Preoperative data were collected from the medical records. At last follow-up, a clinical and radiological evaluation was performed by an independent observer. Passive and active ranges of motion were assessed including forward elevation, external rotation with the elbow at the side (ER1) and with the arm abducted at 90° (ER2), and internal rotation evaluated as the highest vertebral level reached with the tip of the thumb.