Open Laterjet procedure for failed arthroscopic Bankart repair

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Background
Arthroscopic Bankart operation using suture anchors has become the most common surgery to treat post-traumatic anteroinferior instability of the shoulder joint. Recent studies suggested that recurrence of the instability may be higher, reaching 35–40% in patients aged less than 25 years, and the results tend to get worse after long-term follow-up. Open Bankart operation, revision arthroscopic Bankart, and Latarjet operation can be used to restore stability. The authors recommended Latarjet reconstruction in cases of engaging Hill-Sachs lesion, poor capsular quality, or in cases of hyperlaxity, making it an ideal operation to treat both bony and soft tissue pathology after failed capsulolabral reconstructions.
Patients and methods
Eleven patients with failed arthroscopic Bankart repair were operated with open Laterjet technique between January 2011 and December 2014. All patients had a failure (recurrent dislocation or subluxation) after arthroscopic Bankart repair for post-traumatic anteroinferior shoulder instability. The mean age of the patients was 20.8 years (17–30 years). There were eight males and three females. All patients had recurrent subluxation or dislocation and positive anterior apprehension sign as an indication for revision surgery. All patients were examined preoperatively with plain radiographs (anteroposterior and axillary views) and computed tomography scans. Functional outcome and stability were assessed using Western Ontario Shoulder Instability score.
Results
All patients in the study had a stable shoulder at follow-up, except one patient who had symptoms of instability. Functionally, the mean Western Ontario Shoulder Instability was 27.8% (range: 10–80%). The Score was better in patients with a stable shoulder compared with the one patient with an unstable shoulder. There were no intraoperative or postoperative complications.
Conclusion
Open Latarjet operation is a good option for failed arthroscopic Bankart repair. The instability recurrence rate is acceptable, and the reoperation rate was low.

Keywords:
Bankart repair, Laterjet procedure, shoulder instability

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Introduction

Arthroscopic Bankart repair using suture anchors has become the most common surgery to treat post-traumatic anteroinferior instability of the shoulder joint. The results are usually good, but recent studies have suggested that recurrence of the instability may be higher, reaching up to 35–40% in patients aged less than 25 years, and the results tend to get worse after long-term follow-up [1–4]. Most patients with failed Bankart repair are active young persons, and revision stabilization surgery is often needed. Open Bankart repair, revision arthroscopic Bankart, and Latarjet operation can be used to restore stability [5–8]. Despite several studies, the optimal revision technique is poorly defined in the literature. Risk factors for failure of arthroscopic Bankart repair include young age, male sex, bony defects, contact sports, hyperlaxity, and poor quality capsule [9]. According to biomechanical and clinical data, the critical size of glenoid erosion is estimated to be 20–30% of the glenoid width, and unrecognized glenoid or humeral bony defects are considered the most common reasons for recurrence after Bankart repair [10–12]. Several studies have proposed techniques to measure bony defects, but the optimal method to quantify these defects is poorly understood, and it is very difficult to reproducibly assess all bony pathology in routine clinical practice [13,14]. The variety and combination of soft tissue and bony pathology makes it even more difficult to choose the appropriate method for each case needing revision surgery. Several studies have reported results of arthroscopic revision Bankart operation, but all have

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excluded patients with bone defects or increased laxity [6]. Glenoid bony defects are regarded as the most important indication for Latarjet operation [15]. Additionally, some authors have also recommended Latarjet reconstruction in cases of engaging Hill-Sachs lesion, poor capsular quality, or in cases of hyperlaxity, making it an ideal operation to treat both bony and soft tissue pathology after failed capsulolabral reconstructions [11,16]. Although several papers have reported the clinical outcomes of Latarjet operation as primary surgery, only a few papers have reported on Latarjet operations after failed arthroscopic stabilization [17,18].

The aim of this study was to assess the functional results of open Latarjet operation as a revision surgery for recurrent instability after arthroscopic Bankart repair.

Patients and methods

Eleven patients with failed arthroscopic Bankart repair were operated with open Laterjet technique at Zagazig University Hospital between January 2011 and December 2014. This prospective study was conducted after approval of the Ethics Committee of the University Hospital. All patients had a failure (recurrent dislocation or subluxation) after arthroscopic Bankart repair for post-traumatic anteroinferior shoulder instability. The mean age of the patients was 20.8 years (17–30 years). There were eight males and three females. All patients had recurrent subluxation or dislocation and positive anterior apprehension sign as an indication for revision surgery. All patients were examined preoperatively with plain radiographs (anteroposterior and axillary views) and computed tomography scan. Eight patients had a Hill-Sachs lesion, and three had no signs of a Hill-Sachs lesion. Two patients had normal contour of the anterior glenoid, eight had signs of glenoid erosion, and one patients had a visible bone fragment (bony Bankart lesion). No attempt was made to grade the size of the bony defects, and all patients had an open Latarjet operation regardless of bony or soft tissue pathology. Patients with epilepsy were ruled out from the study.

Arthroscopy was not performed before surgery. Laterjet procedure was done for all cases. All patients were placed in a beach–chair position and the arm was draped free to allow intraoperative abduction and external rotation, and then a deltopectoral approach was used. The skin incision was vertical from the tip of the coracoid extending 4–5 cm toward the axillary fold. The pectoralis minor was released from the coracoid. Using an oscillating saw, osteotomy of the coracoid was made from medial to lateral. Two drill holes were made using a 3.2 mm drill. The holes were placed in the central axis of the coracoid and about 1 cm apart. The subscapularis was exposed. The superior and inferior borders of the muscle should be identified. The location of the subscapularis split was at the junction of the superior two-thirds and the inferior one-third. Using the 3.2 mm drill, the first hole was created at the 5 'o' clock position in the glenoid, sufficiently medial that the coracoid will not overhang the glenoid. The screw was placed into the drilled hole in the glenoid and tightened into position, ensuring that the coracoid was in the requested position, parallel to the articular margin of the glenoid with no overhang. The capsule was repaired to the stump of the coracoacromial ligament using a Number 1 absorbable braided suture. Partially threaded screws of 4 mm were used to secure the coracoid process in all cases.

All patients were placed in a simple sling for a period of 2 weeks for comfort. This also encourages rest, reducing the risk of hematoma formation. Rehabilitation starts on the first postoperative day with active motion of fingers, hand, and elbow. Passive range of motion of the shoulder also starts on the first postoperative day, either with the assistance of the other arm in the bed or with pendulum-type exercises. Standard postoperative rehabilitation protocol was advised for three months. Return to full sports activity (including contact sports) was allowed at 3 months. Radiographs were obtained on the first postoperative day and at 3 months. The mean time interval from primary stabilization to Latarjet operation was 30.18 (range: 9–56) months. The length of follow-up was an average of 24.45 (range: 12–36) months.

The main outcome measures were to assess recurrence of instability. Western Ontario Shoulder Instability (WOSI) score [19] was used for postoperative evaluation of all patients in the study.

Statistical methods

Summary data are presented as the mean and SD with the range unless otherwise stated.

Results

According to stability, all patients in the study had a stable shoulder at follow-up except one patient who

had symptoms of instability. The patient had experienced 1–2 subluxations during 6 months following his surgery. No dislocation occurred in this study group (Figs 1 and 2).

Functionally, the mean WOSI was 27.8% (range: 10–80%). The score was better in patients with a stable shoulder compared with the one patient with an unstable shoulder.

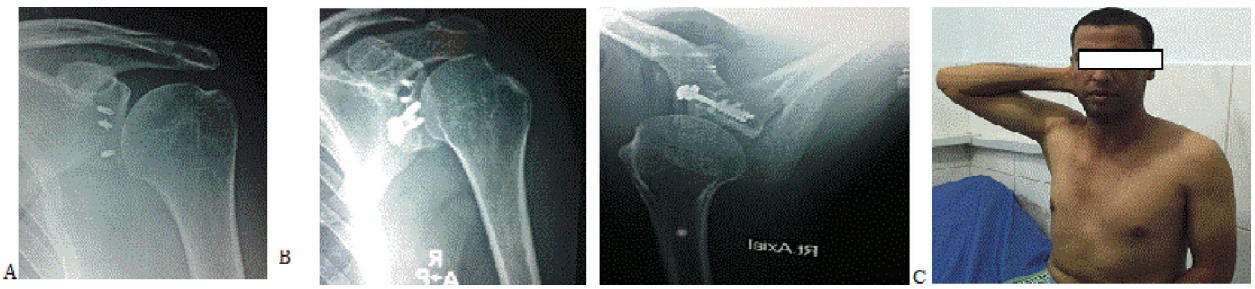
The number of previous arthroscopic stabilizations, age or sex, delay from the primary operation, length of follow-up, and the presence of a Hill-Sachs lesion or glenoid rim lesions on plain radiographs and computed tomography did not have any effect on stability, and WOSI score.

The patient with subluxation did not have symptoms severe enough to consider revision operations. There were no intraoperative or postoperative complications.

Discussion

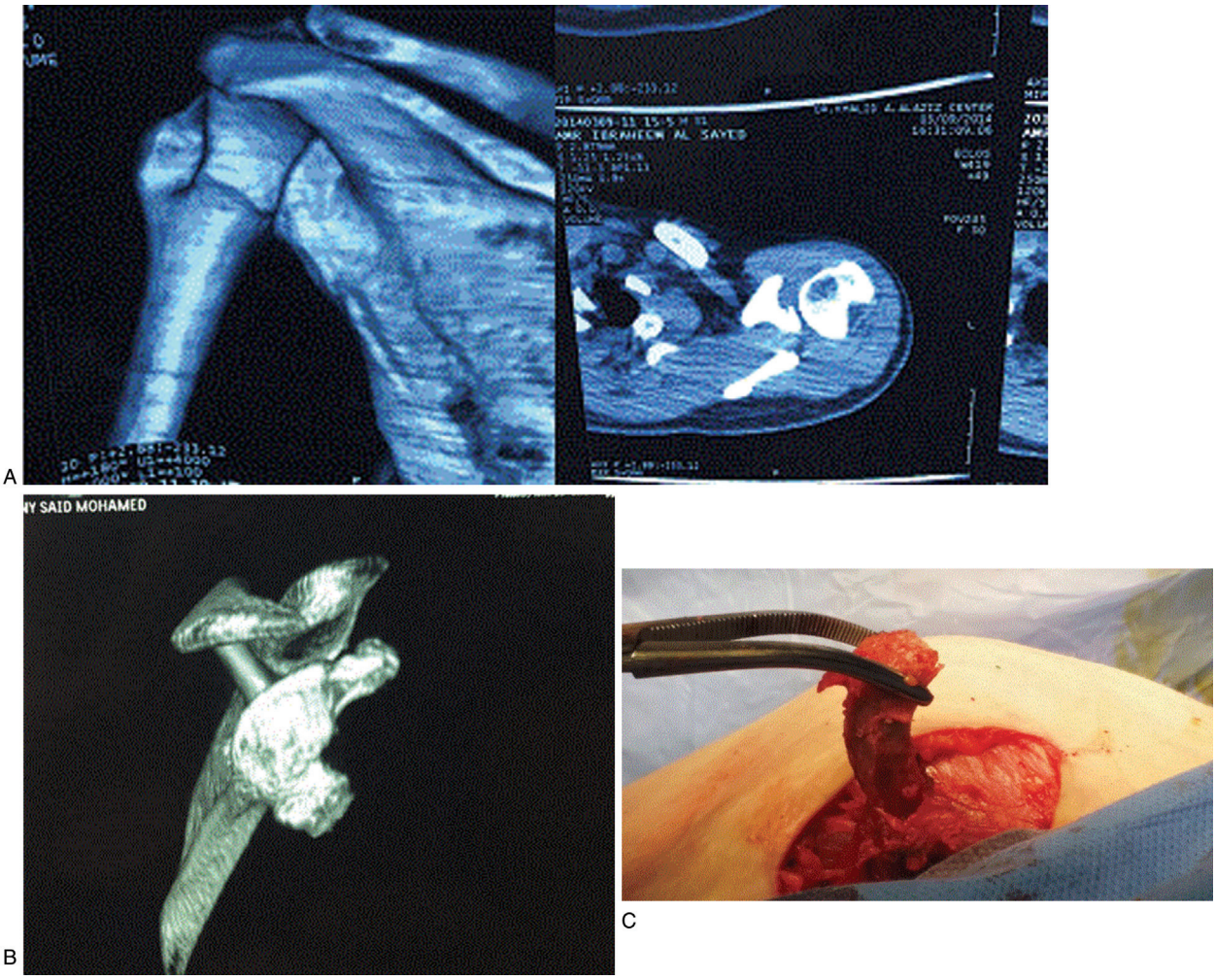
In this study, we found that open Latarjet operation after failed arthroscopic Bankart repair resulted in a low recurrence rate and good functional scores after a mean 24.45 months of follow-up. The patients with instability symptoms clearly had worse WOSI score compared with those with a stable shoulder. Instability symptoms were mild and did not require reoperation. With meticulous surgical techniques, the complication rate was low, indicating that Latarjet operation is safe as a revision surgery. Three studies have been published concerning revision Latarjet operation after failed Bankart stabilization. Schmid *et al.* [7] reported the results of 49 patients who had undergone Latarjet operation as revision surgery. Prior operations included both open and arthroscopic Bankart stabilizations. After a mean follow-up of 38 months, 14% of patients had symptoms of instability. No reoperations were needed. Dezaly *et al.* [17] reported the outcomes of 27 patients treated with an open Latarjet operation after failed arthroscopic Bankart repair. They found recurrent dislocation in 11% and a positive apprehension sign in 40% after an average of 68 months of follow-up. Bonnevialle *et al.* [18] compared outcomes of open selective capsular repair (n=5) and coracoid bone block (n=6) in recurrent shoulder instability after capsular repair. Both techniques resulted in similar functional outcomes, with no recurrence of instability after a minimum follow-up of 24 months. All previous studies of Latarjet operation as revision surgery have reported higher recurrence rates compared with primary surgery using coracoid transfer techniques [16,20]. Several studies have reported the results of arthroscopic revision Bankart [21–23] and open Bankart repair [5,24] after failed previous surgery. A recent systematic review concluded that in properly selected patients, the recurrence rate of arthroscopic Bankart repair is 12.7%, and that the rate is similar in arthroscopic and open Bankart [6]. Most reports on arthroscopic revision Bankart have included small numbers of patients who had multiple previous surgeries. Furthermore, all studies excluded patients with bony pathology, often cited as 20–30% glenoid loss or as an engaging Hill-Sachs lesion, but only a few studies have described the method used to assess bony pathology in detail. Recent systematic reviews raised concerns about the short-term complications of coracoid transfer operations [25–27]. The reported complication rates have ranged from 16–30%, including instability, nerve palsies, hardware complications, intraoperative fractures, and infections. According to this study, recurrent instability was reported in one patient, but all other complications could be avoided if a meticulous surgical technique was used. We did not study the incidence of post-traumatic osteoarthritis because the follow-up time was too short. According to a recent long-term

Figure 1



A 24-year-old male patient who had arthroscopic Bankart repair with anchor sutures and started to complain of right shoulder instability 1 year later. (a) Preoperative anteroposterior radiography showing the anchor sutures; (b) postoperative anteroposterior and axillary view demonstrating correct placement of the graft with no lateral overhang and bicortical screw fixation; (c) the patient with a stable right shoulder.

Figure 2



A 20-year-old male patient who had arthroscopic Bankart repair with anchor sutures and started to complain of right shoulder instability 1.5 year later. (a) Preoperative computed tomography scan showing the Hill-Sachs lesion; (b) intraoperative image showing coracoid osteotomy; (c) computed tomography 6 months postoperatively demonstrating correct placement of the coracoid with good union.

study, up to 36% of patients have signs of mild arthropathy following Latarjet after 16 years of follow-up [28]. However, it is likely that the type of surgery is not responsible for the osteoarthritis, as a similar incidence was found in a study comparing Bankart and Latarjet [29]. The stabilizing mechanisms of Latarjet and Bankart operations are different, and the efficacy of these operations should be compared in a prospective randomized study [30,31]. Preoperative examinations should include computed tomography imaging and measurements of bony defects as well as soft tissue pathology. Preventing failure of the primary operation would be extremely important, as these young patients lose 4–6 months of their time after each stabilization surgery.

Conclusion

Open Latarjet surgery is a good option for failed arthroscopic Bankart repair. Recurrence rates of instability are acceptable, and reoperation rates were low.

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Conflicts of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. ICMJE forms for all authors are available online.

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