Short-term outcomes of arthroscopic Bankart repair versus open Latarjet procedure in high-demand patients with recurrent anterior shoulder dislocation without significant bone loss

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Purpose
The aim of this study was to compare the short-term outcomes and return to work/sport between open Latarjet procedure and arthroscopic Bankart repair in high-demand patients with recurrent post-traumatic anterior shoulder dislocation without significant bone loss. The authors hypothesized that open Latarjet procedure would allow for an earlier return to work and sports activity with lower rate of recurrence.
Patients and methods
This is a randomized clinical trial conducted on 30 high-demand patients with recurrent post-traumatic anterior shoulder dislocation. All patients had no significant glenoid or humeral head bone loss. Fifteen patients underwent arthroscopic Bankart repair and 15 patients underwent open Latarjet procedure. The main criteria for assessments were Rowe score, shoulder range of motion, and return to work/sport.
Results
The main findings of this study were that all patients returned to work/sport and the mean time was 6.4 months postoperatively. Patients who underwent open Latarjet procedure returned to work/sport more rapidly than patients who underwent arthroscopic Bankart repair (P=0.021). The mean postoperative Rowe score was higher in patients who underwent open Latarjet procedure. But was not statistically significant.
Conclusions
Both arthroscopic Bankart repair and open Latarjet procedure are valid surgical options and have adequate outcomes in the treatment of patients with recurrent post-traumatic anterior shoulder dislocation and participate in heavy shoulder activities. But patients with arthroscopic Bankart repair take a longer time to return to work/sport.

Keywords:
Bankart, instability, Latarjet, return to work/sport, Rowe, shoulder

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Introduction

Two techniques are widely applied in the surgical management of recurrent anterior shoulder dislocation: coracoid transfer as described by Latarjet and modified by Patte, and Bankart repair. Both give good functional results [1].

Despite the advanced arthroscopic techniques, concerns have been raised as regards the high recurrence rates in patients with heavy shoulder activities treated by soft-tissue procedure [2].

Few studies have compared the open Latarjet procedure with the arthroscopic Bankart procedure. This can be attributed to surgeon preference to one technique over the other, the extreme variability of patients with shoulder instability that makes the matching process difficult, and controversies about proper outcome measurement [3].

Many studies have evaluated complications associated with shoulder-stabilizing procedures, but few have investigated the return to sports [4].

The key to successful management of anterior shoulder dislocation in this category of patients is making the appropriate diagnosis and performing the suitable operation at the optimum time to prevent unnecessary time away from work/sport.

The purpose of this study was to compare the short-term outcomes and the time of return to work/sport after open Latarjet procedure versus arthroscopic Bankart repair in high-demand patients with recurrent anterior shoulder

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dislocation without significant bone loss. We hypothesized that open Latarjet procedure would allow for an earlier return to work and sports activity with a lower rate of recurrence.

Patients and methods

We conducted this randomized clinical trial of 43 patients through the duration from August 2014 to November 2016, treated for recurrent post-traumatic anterior shoulder dislocation using either open Latarjet procedure or arthroscopic Bankart repair. The study was approved by the institutional ethics committee in the Orthopedic Department of Orthopaedic Surgery, Ain Shams University, Cairo, Egypt. Inclusion criteria included, first, high-demand patients (manual workers, contact, and collision athletes) with recurrent post-traumatic anterior shoulder dislocation; second, age from 18 to 55 years old. Exclusion criteria included first, low-demand patients; second, significant bone loss (glenoid bone loss more than 15% of glenoid width using best-fit circle on en face view of ipsilateral shoulder and/or humeral Hill–Sach lesion more than 20% of humeral head articular surface); third, first-episode anterior shoulder dislocation; fourth, failed previous shoulder-stabilizing procedure for recurrent shoulder dislocation; fifth, associated glenohumeral pathology [e.g. osteoarthritis (OA), superior labrum lesion from anterior to posterior (SLAP), and rotator cuff tear (RCT)]; sixth, atraumatic multidirectional instability patients and patients with hyperlaxity according to Beighton score; and seventh, incomplete outcome data up to 1-year follow-up.

Preoperatively, clinical and radiological evaluation of all patients was done, including instability tests, shoulder range of motion (ROM), Rowe score, shoulder MRI, and computed tomography scan, including 3D reconstruction with humeral head subtraction with an 'en face' view of the glenoid.

Computer-generated randomization of the patients into arthroscopic Bankart group (22 patients) and Latarjet group (21 patients) was done. Thirteen patients were lost for the final follow-up and excluded (seven patients in arthroscopic Bankart group and six patients in Latarjet group). Thirty patients were available for the final follow-up evaluation. Fifteen patients underwent arthroscopic Bankart repair procedure and 15 patients underwent open Latarjet procedure. The patients were evaluated by Rowe score to address the degree of pain, the presence of symptoms of instability and discomfort, recurrence of dislocation or subluxation, and the return to sports activity and level of participation. A clinical examination was carried out for the ROM of the shoulder in forward flexion, external rotation at side, and internal and external rotation of the shoulder in 90° abduction. Informed consent was obtained from all individual participants included in the study.

Technique of Bankart repair

All patients (100%) received general anesthesia with an endotracheal intubation. Examination under anesthesia was done. The patients were positioned in beach-chair position. The posterior-viewing portal was established and then the anterior—inferior portal was established within the rotator interval. An 8-mm arthroscopic cannula in the anteroinferior portal was used. Diagnostic arthroscopy was used to fine-tune the preoperative diagnosis. By using the anterior–inferior portal as the working portal, adequate preparation for Bankart repair was done by arthroscopic elevator. The exposed labral edge of a Bankart lesion was debrided with a motorized shaver to promote healing after repair. Decortication of the anterior glenoid neck from the edge of the articular cartilage medially by rasp was done. Capsular tension and mobility were evaluated. Bankart repair suture anchor 2.8-mm FASTac (Arthrex, Naples, Florida, USA) was applied by using a cannulated guide at 5.30 o'clock position for the right shoulder and at 6.30 o'clock position for the left shoulder. A sharp tip suture retriever was passed through labral tissue below the anchor and one limb of the suture was retrieved. A sliding knot with subsequent locking half-hitches was preferred in our study for knot tying. According to the length of the labral detachment, this procedure was repeated about two times, but the sutures were retrieved at the level of the anchor. Standard closure of the portals was performed and shoulder immobilization in pouch arm sling with immobilizer was done.

Technique of Latarjet procedure

All patients received general anesthesia with an endotracheal intubation. The patients were placed into a beach-chair position. The arm was draped free. About a 5-cm incision was made from the coracoid, directed inferiorly. The plane between the deltoid and pectoralis major was identified by the cephalic vein. The cephalic vein was retracted laterally. The coracoacromial ligament was identified and released from coracoid by electrocautery. The insertion of the pectoralis minor into the coracoid was identified and sharply removed. The coracohumeral ligament was released at the lateral base of the coracoid. A microsagittal saw was used to osteotomize the base of the coracoid and just anterior to coracoclavicular ligament. The undersurface of the

coracoid was decorticated using a high-speed burr or saw. The subscapularis tendon was identified and split horizontally in line with its fibers at its mid-portion. A vertical capsulotomy was performed adjacent to the glenoid rim. The anterior–inferior capsule and labrum were excised and the periosteum of the anterior–inferior glenoid neck was elevated. The antero–inferior glenoid neck was decorticated with power burr for preparation of the coracoid transfer. The proposed placement was carefully evaluated and the coracoid was fixed by two 4-mm cannulated screws. The wound was closed in a layered fashion. Shoulder immobilization was performed using pouch arm sling with immobilizer.

Rehabilitation program

The shoulder was immobilized in a pouch arm sling with immobilizer for 4 weeks. During this period, the patient was allowed to move his elbow and wrist freely. Pendulum exercise was permitted five times daily, 5 min each session. Formal physiotherapist-supervised rehabilitation commenced at 4 weeks following surgery and the return to work/sport was allowed according to the progression of each patient in the rehabilitation pathway.

Results

Demographics

All patients were males and with a mean age of 30.4 years (range: 20–40 years). There were 28 dominant (93.3%) and two nondominant (6.7%) shoulders. The median number of preoperative dislocation episodes was 5 (mean: 6.5; range: 2–20 times). Twenty patients were manual workers (66%), three were recreational athletes (10%), and seven were (23.3%) professional athletes. The mode of the first dislocation was direct trauma in 11 patients (36.6%) and indirect trauma in 19 patients (63.3%).

Eleven manual workers, three professional athletes, and one recreational athlete underwent arthroscopic Bankart repair. Nine manual workers, four professional athletes, and two recreational athletes underwent open Latarjet. Age, number of dislocations, time from the first dislocation to surgery, preoperative shoulder ROM, and Rowe score were close in mean values between the two groups and had no significant difference. All patients were males.

Return to work/sport

All patients returned to work/sport and the mean time to return was 6.4±2.6 months. Four patients returned to sport at the same preinjury level, 14 patients returned to the same work/sport with no limitation in overhead work, but their sport participation could not be assessed because they were not practicing any preinjury sport, three patients returned to the same work/sport with no limitation but not to the same preinjury level, three patients did not return to the same sport, and six patients returned to work but with limitations.

There was a statistically significant difference between the mean time to return to work/sport for patients who underwent arthroscopic Bankart repair operation (7.6 months), and the mean time to return to work/sport for patients who underwent Latarjet operation (5.3 months) (P=0.021) (Fig. 1).

Rowe score

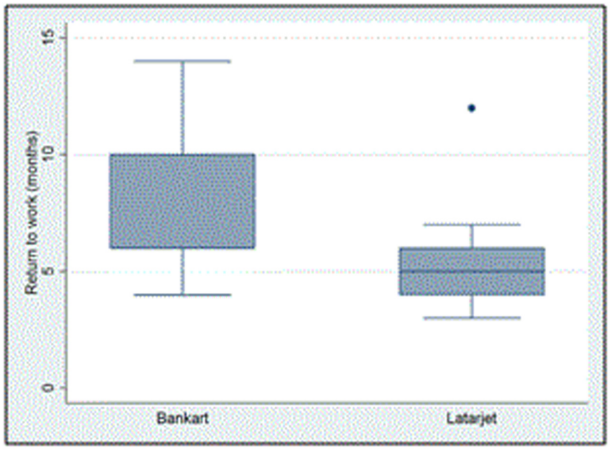
The overall mean Rowe score increased from 33.5±14 points preoperatively to 79.6±18 points postoperatively (P<0.05) in the 30 patients included in this study.

There was no statistically significant difference between the mean postoperative Rowe score for patients who underwent arthroscopic Bankart repair and Latarjet operation (74±18 and 85±15 respectively, P=0.86) (Fig. 2).

Shoulder ROM (forward flexion, external rotation at the side, external rotation at 90° abduction, and internal rotation at 90° abduction):

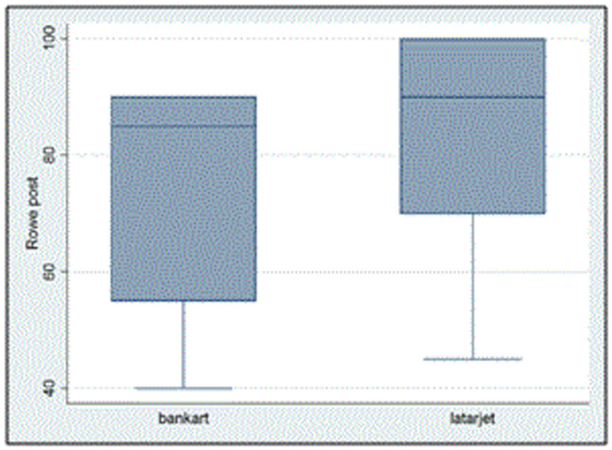
There was no statistically significant difference between the mean postoperative shoulder ROM for patients who underwent arthroscopic Bankart repair operation and the mean postoperative ROM for patients who underwent Latarjet operation *(P*? 0.05).

Figure 1



Mean time to return to work/sport between Bankart group and Latarjet group. Note the shorter time of return with Latarjet.

Figure 2



Mean Rowe score between Bankart group and Latarjet group.

Complications

There were neither iatrogenic nerve injuries, wound infections, nor recurrence at the final follow-up.

Statistical analysis

Score means and medians were compared and analyzed using IBM SPSS statistics software, version19 (IBM Corporation, Somers, New York, USA). Significances were tested using the paired *t*-test for related samples and unpaired *t*-test for independent samples. The results were considered significant at the 95% confidence interval level for all statistical analyses.

Discussion

The main findings of this study were that all patients returned to work/sport after a mean time of 6.4 months postoperatively. Patients who underwent Latarjet procedure returned to work/sport more rapidly than patients who underwent arthroscopic Bankart repair. Postoperative Rowe score was higher in patients who underwent Latarjet procedure, but was not statistically significant.

Return to work/sport

We found that all patients (100%) returned to work/sport and patients who underwent Latarjet procedure returned faster than patients who underwent arthroscopic Bankart repair (5.3 vs. 7.6 months). In Bankart group, nine patients (60%) returned to work/sport without limitations, four patients returned to work but with some limitation, and two patients did not return to the same sport. In Latarjet group, 12 patients (80%) returned to work/sport without limitations (four of them were professional athletes and returned to the same preinjury level), two patients returned to work but with some limitations, and one patient did not return to the same sport. These results were comparable with the results found in the literature.

Béssiere and colleagues compared Latarjet procedure and arthroscopic Bankart repair in two different cohorts. All of their patients returned to their preinjury sport, but only 63% of the patients who underwent an arthroscopic Bankart procedure returned to their sport at the same level compared with 72% of those who underwent Latarjet procedure (P=0.21) [5].

In a retrospective study by Bernager and colleagues that aimed to assess return to sports outcomes following the Latarjet–Bristow procedure, they found that all patients returned to sports after a mean 6.3±4.3 months. In total, 30/47 (63.8%) patients returned to the same sport at the same level and 10/47 (21.3%) patients changed sport because of a shoulder problem. Patients who practiced an overhead sport were more likely to play at a lower level or to change sport postoperatively [4].

In a matched-pair multicenter study focused on the return to sports, Blonna and colleagues found that patients who underwent arthroscopic Bankart stabilization showed a better return to sport and better subjective perception of the shoulder compared with those with the Bristow–Latarjet procedure, although both techniques provided a high rate of return to sport. More than 80% of the patients returned to their sport after both repair techniques. However, the level at which they returned to sports was significantly in favor of arthroscopic Bankart technique. Patients who played sports with high upper-extremity involvement (e.g. swimming, rugby) at a competitive level have a lower level of return to sport with both repair techniques. The ability to resume a high-demand sport seemed to be low and independent of the use of one technique or the other. A study by Kim and colleagues showed a similar correlation between Bankart repair, level of activity/demand, and return to the previous activity level. The return to sports after coracoid transfer was better in studies focused on competitive rugby and soccer players [3].

Colegate-Stone *et al.* [6] evaluated the functional outcomes of athletes with anterior shoulder instability following modified Latarjet reconstruction, 89% of patients were back to their chosen sport at an average of 3.2 months and, for the professional athletes, 100% were back to sports at 3.4 months.

In a study by Mazzocca and colleagues, 100% of all collision and contact athletes returned to organized high-school or college sports. Fifteen percent of those collision athletes had a recurrence, which has not required treatment [7].

In a study by Gerometta and colleagues to evaluate return to sports after arthroscopic Bankart stabilization, 95.7% of patients returned to the same level after an average of 9.8±5.4 months. Sports level was unchanged or better in 82.6%, lower in 8.7%, and 4.5% changed sport because of their shoulder. Male athletes returned to preoperative sports levels faster than female athletes [8].

Clinical and functional outcome

As regards clinical and functional outcome, we found a better postoperative Rowe score in patients who underwent open Latarjet procedure, but no difference was found between arthroscopic Bankart repair and Latarjet procedure as regards postoperative shoulder ROM. These results are comparable with other results found in the literature, as many studies showed that Latarjet procedure is superior to arthroscopic Bankart repair.The meta-analysis by An and colleagues demonstrated that the Latarjet procedure conferred less restriction of external rotation and higher patient-reported outcome measure scores. Bankart repairs demonstrated a significantly greater postoperative restriction of external rotation by 6°. Prior studies have commented on the loss of elevation or internal and external rotation after the Latarjet procedure [9].

Bessière and colleagues suggested that shoulder function after open Latarjet procedure was better than after arthroscopic Bankart repair. Rowe score was higher in the Latarjet group (78 vs. 68, P=0.018) [5].

In a study by Hovelius *et al.* [10], the results were better after the Bristow–Latarjet repair than after Bankart repair done with anchors with respect to postoperative stability and subjective evaluation.

Limitations

There are several potential criticisms of this study, the follow-up period is relatively short and will need to be continued, this study comprised a small number of heterogeneous patients, nondigital measuring of ROM, and the Rowe score was verbally translated and lacked cultural adaptation.

Conclusion

Both arthroscopic Bankart repair and open Latarjet procedure are valid surgical options and have adequate outcomes in the treatment of patients with recurrent post-traumatic anterior shoulder dislocation and participate in heavy shoulder activities. But patients with arthroscopic Bankart repair take a longer time to return to work/sport.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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