

Outcomes of Shoulder Instability Repair - Latarjet vs Arthroscopic Bankart Repair: A Retrospective Study

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Abstract

This retrospective study aimed to compare the outcomes of two surgical procedures, Latarjet repair and arthroscopic Bankart repair, for the treatment of anterior shoulder instability. The study included 31 patients between the ages of 16 and 40 years who underwent either Latarjet repair or arthroscopic Bankart repair. The patients were evaluated using the Constant Murley Shoulder Score (CMS) and the American Shoulder and Elbow Surgeons Score (ASES) at 3, 6, and 12 months postoperatively. The results showed a gradual improvement in functional outcomes for both groups during the follow-up period. At one year postoperative, the Bankart repair group exhibited a CMS score of 89.3 and an ASES score of 94.1, while the Latarjet repair group showed a CMS score of 87.8 and an ASES score of 91.3. Statistical analysis revealed no significant differences in the CMS scores at any follow-up time point. However, the ASES score at 12 months postoperative was significantly higher in the Bankart repair group compared to the Latarjet repair group. The findings of this study suggest that both Latarjet repair and arthroscopic Bankart repair yield favorable clinical outcomes in terms of functional improvement for patients with anterior shoulder instability. Although arthroscopic techniques are minimally invasive and preferred by surgeons, the Latarjet procedure offers comparable results with less expenditure. The choice of surgical approach should be based on factors such as the patient's age, level of activity, and the presence of significant bone defects or soft tissue deficiencies. Further comparative studies with long-term follow-ups are recommended to validate these findings and provide more comprehensive insights into the outcomes of these procedures.

Keywords: Shoulder instability; Arthroscopy; Bankart; Hill-Sachs; Bone loss.

Introduction

Anterior shoulder instability is the most common form of shoulder instability, one which may result from a number of traumatic events like fall on an outstretched hand, collision, to name a few, or numerous atraumatic causes which include repetitive microtrauma such as in over shoulder athletes, and overhead labourers. Generalized ligamentous laxity is also a cause of atraumatic instability. Instability can be of variable severity, ranging from subtle instability producing debilitating symptoms to gross instability causing dislocation of the glenohumeral joint. Advanced imaging modality coupled with detailed history and thorough examination is required to form a diagnosis.

For first time dislocation, non-surgical management maybe an initial option in low demand individuals with shoulder immobilization for a period of 3 to 10 days, followed by early rehabilitation aiming for pain free, full range of motion and strengthening of dynamic glenohumeral stabilizers, with return to sports in 7 to 21 days. [1] However, for an athlete, aged 14 to 30 years, experiencing first time anterior Gleno-humeral dislocation, and having positive apprehension on examination along with significant bone loss, American Shoulder and Elbow Surgeons recommend surgical management. Even for a non-athlete having positive apprehension on examination coupled with significant bone loss are strong predictors of surgery. [2]

Surgical management of unstable or recurrent dislocation is dependent on multiple factors which including age of the patient, level of activity present, nature of sports participation and patient's expectations. The culprit lesion needs to be identified which may be a Bankart lesion (Including Perthes, Anterior Labro-ligamentous periosteal sleeve avulsion ALPSA, Gleno-labral articular disruption GLAD), Capsular injury and laxity (Including Humeral avulsion of Gleno-humeral ligament HAGL), Hill Sachs lesion, Glenoid fracture or dysplasia (Including bony Bankart lesion); [3] of which, the Bankart lesion is the most important one.

Surgical treatment for shoulder instability may vary from minimally invasive arthroscopic repair techniques to open repairs and open reduction internal fixation for associated fractures, focusing on anatomic (Approach to correct the identified abnormality) vs non-anatomic repairs. [4] A variety of arthroscopic methods are being used to address various lesions that cause instability; however, the standard procedure for treatment of anterior stabilization is open stabilization, especially for cases where the patient has severe instability, numerous revision surgeries and for athletes participating in contact sports. [5] Some of the previously and currently used procedures include Boyd-Sisk, Magnusson-Stack, Putti-Platt, Remplissage, open and arthroscopic Bankart repair, capsular shift, capsular plication, Bristow-Latarjet and bone graft reconstruction.

Open surgical treatment for anterior glenohumeral instability is time tested and reliable with excellent clinical outcomes, as opposed to arthroscopic techniques which are still evolving, lacking long term evaluations, requiring greater expertise and being much more expensive. In many instances, arthroscopy is the preferred technique by surgeons due to its minimally invasive nature, precluding the need for releasing and repairing of subscapularis and decreased morbidity, but, recent studies demonstrate comparable results of arthroscopically treated and open treated shoulders for instability.

Despite the new advances in recent years, open surgery still remains an acceptable method of treatment especially when there is lack of equipment, technical expertise or experience. Furthermore, it is the more preferred method of treatment when the pathology in question cannot be adequately addressed via an arthroscopic procedure such as anterior instability associated with significant bone defects or soft tissue deficiencies. [4]

Many tools are applicable in assessment of shoulder function following rotator cuff repair, be it all arthroscopic, arthroscopic assisted or all open. Number of scoring instruments used to assess the functional outcomes following rotator cuff repair have been documented in literature, however, we will use 2 of these scoring systems in this study. The Constant-Murley Score (CMS) which is used to assess the shoulder function by means of patient reported findings and physical assessment of the range of motion and strength of the shoulder. The American Shoulder and Elbow Surgeons (ASES) Shoulder Outcome Score is yet another tool to assess shoulder function divided in physician and patient assessment domains which evaluates pain, instability, activities of daily living. [6]

Local studies have been carried out, focusing on treatment of anterior shoulder instability via Latarjet procedure, all of which have concluded Latarjet technique to be safe & effective, reporting good to excellent functional outcomes & patient satisfaction. One of these studies assessed post-operative outcomes using Constant Murley Shoulder Score [7], whereas other two studies utilized Rowe score as their assessment tool [8][9].

This study will compare the clinical outcomes of open surgical management via Latarjet procedure and arthroscopic Bankart repair. The objective behind this study is to determine whether Latarjet procedure is a safe, effective and economical method of treating anterior shoulder instability, yielding the same functional outcome as in arthroscopic Bankart repair.

Methodology

We conducted this retrospective observational study in the Department of Orthopedics at Ziauddin Hospital Clifton and Ziauddin Hospital Kemari, in Karachi Pakistan from June 2017 to May 2022. The inclusion criteria include all patients from ages 16 years old to 40 years old, diagnosed with anterior shoulder instability, who underwent Latarjet Repair or Arthroscopic Bankart Repair. Patients with atraumatic shoulder dislocation, glenoid bone loss, multi directional shoulder instability, rotator cuff tears, neuromuscular paralysis, ipsilateral shoulder fractures, glenohumeral osteoarthritis, revision surgery and inadequate follow-up were excluded from the study.

All patients in both groups underwent thorough history and clinical examination to determine the existence and direction of instability. Clinical tests performed included range of motion, anterior drawer test, apprehension test and relocation test. Comparative clinical examination of contralateral shoulder and other joints was done to rule out generalized ligamentous laxity. Those positive for shoulder apprehension were referred for X-Rays / MRI / CT study. Specific causative pathology was identified on MRI, and CT was done to evaluate for glenoid bone loss. Informed consent was obtained from all the patients before surgery. Post procedure, all patients were followed in OPD at 3 months, 6 months and 12 months. Functional outcomes were evaluated at each follow up visit via Constant Murley Shoulder Score (CMS) and American Shoulder and Elbow Surgeons Score (ASES).

The data was analyzed by SPSS 24. Quantitative variables were expressed as mean and standard deviation. While qualitative variables were expressed as frequency and percentages. The post operative CMS and ASES scores were compared, P value was calculated and P value <0.05 was considered significant.

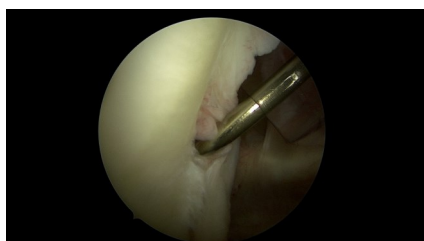


Figure-1: Identification and demonstrating Bankart lesion.

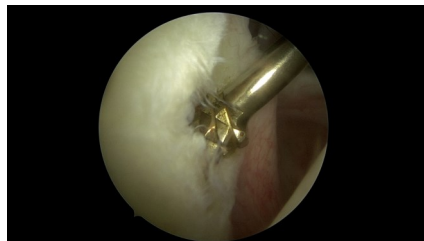


Figure-2: Preparation of the Glenoid bed.



Figure-3: Placement of anchor sutures.



Figure-4: Showing repair with one anchor suture in place and guide wire for 2nd anchor suture placement.



Figure-5: Showing repair done with anchor sutures in situ.



Figure-6: Anteroposterior View of the right Shoulder Joint showing no Bony Lesion with a soft tissue Bankart lesion of one of the patients included in our study.



Figure-7: Lateral View of the right Shoulder Joint of the same patient with no Bony Bankart with a soft tissue Bankart lesion of the same patient included in our study.



Figure-8: Post-operative X-Ray Grashey View of right shoulder showing Screws in-situ holding the graft (Latarjet procedure) for the soft tissue Bankart lesion of the same patient included in our study.

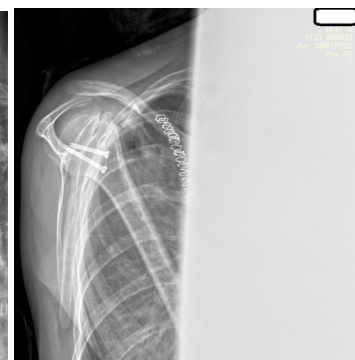


Figure-9: Y-view of the right Shoulder Joint showing post-operative X-Ray of the right shoulder joint after Latarjet procedure for the soft tissue Bankart lesion of the above-mentioned patient, included in our study.

Results

In this study the total number of patients were 31. Out of these, 26 (83.9%) were male, 5 (16.1%) were female. The mean age was 27.3 ± 7.2 years. Bankart repair was performed in 19 (61.3%) patients, Latarjet was performed in 12 (38.7%) patients. Gradual improvement of functional outcome, as indicated by increased CMS score and ASES score, was noted in the post operative follow up period (as shown in table 1 and 2). There was significant improvement at one year follow up with CMS score 89.3 ± 3.8 and ASES mean score 94.1 ± 2.4 of the Bankart repair group, and mean CMS score 87.8 ± 5.8 and ASES score 91.3 ± 3.1 of the Latarjet repair group.

Table 1 - Bankart Repair, Follow up outcomes.

Bankart Repair	3 months	6 months	12 months
CMS score	62.3 ± 8.0	77.4 ± 5.6	89.3 ± 3.8
ASES score	72.5 ± 6.3	84.8 ± 5.3	94.1 ± 2.4
Able to return to work	18 (94.7%)	19 (100%)	19 (100%)
Fully able to carry out daily activities	10 (52.6%)	18 (94.7%)	19 (100%)
Achieved complete ROM	16 (84.2%)	19 (100%)	19 (100%)

Table 1 - Showed gradual improvement in CMC and ASES outcome scores at gradual interval of time period of 3 to 12 months.

Table 2 - Latarjet Repair, Follow up outcomes.

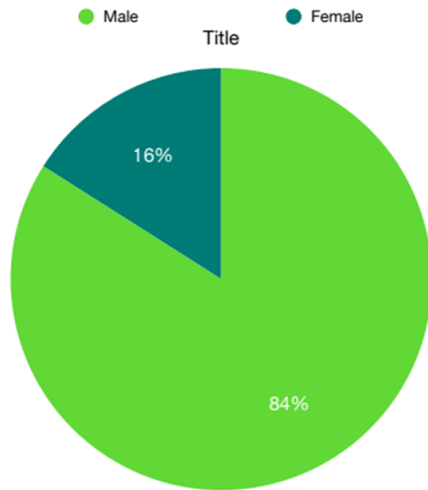
Latarjet Repair	3 months	6 months	12 months
CMS score	61.0 ± 7.2	75.6 ± 7.2	87.8 ± 5.8
ASES score	72.0 ± 6.1	81.9 ± 5.8	91.3 ± 3.1
Able to return to work	11 (91.7%)	12 (100%)	12 (100%)
Fully able to carry out daily activities	5 (41.7%)	10 (83.3%)	12 (100%)
Achieved complete ROM	12 (100%)	12 (100%)	12 (100%)

Table – 2 showed CMS and ASES outcomes scores in Latarjet repair procedure with gradual improvement in scores at subsequent time intervals.

Table 3 - P values for CMS score, CMS grading and ASES score.

P Values	3 months	6 months	12 months
CMS score	0.646	0.431	0.384
CMS Grading	0.943	0.512	0.296
ASES Score	0.835	0.163	0.011

CMS grading at 12 months showed 18 (94.7%) patients with excellent outcome and 1 (5.3%) patient with a good outcome of the Bankart group. Whereas there were 10 (83.3%) patients with excellent outcome and 2 (16.7%) patients with a good outcome of the Latarjet group. There were no fair or poor outcome noted at 12months.



Gender

Table- 4

Gender	
Right	20 (75%)
Left	11 (25%)
Dominant Hand	
Right	20 (75%)
Left	11 (25%)
Surgical Site	
Right	16 (51.6%)
Left	15 (48.4%)

Table -4 showed majority of patient population was male with right hand dominance and the operated site is 75% of right side.

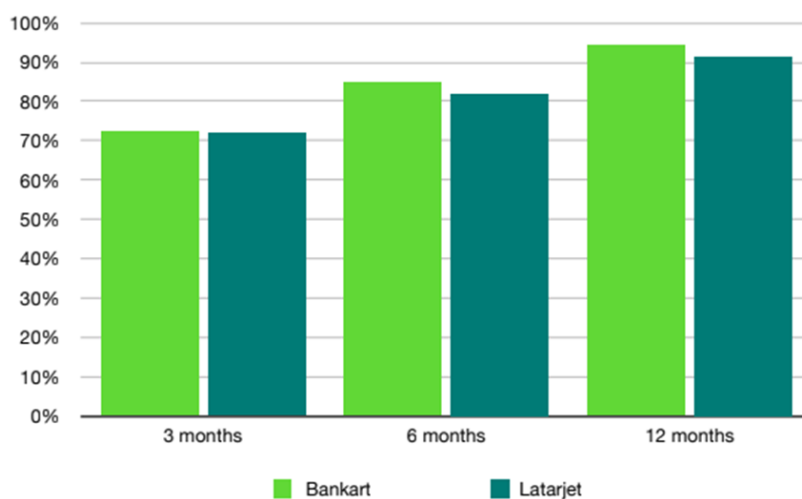


Table - 5		
	Bankart (n=19)	Latarjet (n=12)
CMS at 3 months		
Poor	7 (36.8%)	5 (41.7%)
Fair	8 (42.1%)	5 (41.7%)
Good	4 (21.1%)	2 (16.7%)
Excellent	-	-
CMS at 6 months		
Poor	-	-
Fair	2 (10.5%)	3 (25%)
Good	11 (57.9%)	5 (41.7%)
Excellent	6 (31.6%)	4 (33.3%)
CMS at 12 months		
Poor	-	-
Fair	-	-
Good	3 (25%)	1 (12.5%)
Excellent	9 (75%)	7 (87.5%)

Table- 5 showed comparison of Bankart and Latarjet procedure in terms of CMS functional outcome score with both groups came in excellent category from 6 months onward.

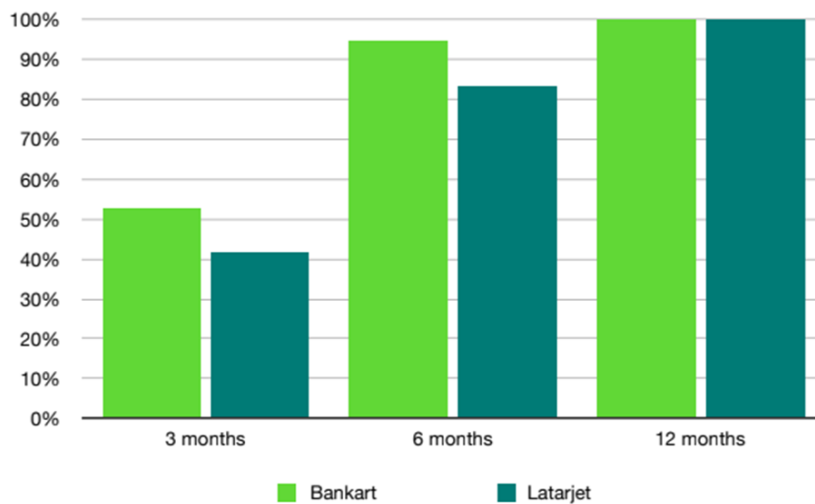
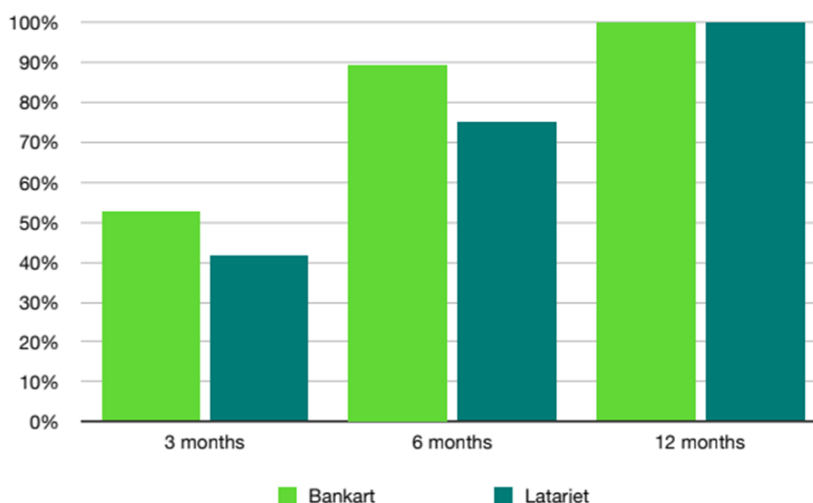


Table - 6			
ASES Score			
Follow-up Duration	Bankart (n=19)	Latarjet (n=12)	P-value
(Months)	(Mean Score)	(Mean Score)	
3	72.5	72.0	0.835
6	84.8	81.9	0.163
12	94.1	91.3	0.011

Table- 6 showed comparison of Bankart and Latarjet procedure in terms of ASES functional outcome score with both groups got significant improvement at 12 months.



Follow-up Duration (Months)	Return to work / Able to do their usual work	
	Bankart (n=19)	Latarjet (n=12)
3	52.6%	41.7%
6	94.7%	83.3%
12	100%	100%

Table- 7 showed all patients of both groups of Bankart and Latarjet procedure return to work/ able to do work at 12 months.

Follow-up Duration (Months)	Achieved Complete ROM	
	Bankart (n=19)	Latarjet (n=12)
3	52.6%	41.7%
6	89.4%	75%
12	100%	100%

Table- 8 showed all patients of both groups of Bankart and Latarjet procedure achieve complete ROM at 12 months.

Discussion

Shoulder instability can be because of a traumatic injury, which commonly presents as an anterior shoulder injury. Proper patient selection is crucial for achieving favorable outcomes. Surgery is recommended for patients with a high risk of recurrence or for elite athletes. [1] Reaching a unanimous decision for the treatment of patients with FTAGD was challenging. However, certain factors specific to each patient, such as significant bone loss and apprehension, increased the likelihood of surgery following FTAGD in all populations. According to more than 90% of experts in shoulder instability, surgical intervention is recommended for contact athletes who are over 14 years old, have apprehension, and experience meaningful bone loss after FTAGD at the end of the season. On the other hand, more than 90% of experts would not recommend surgery for non-athletic patients who experience their first dislocation and do not have apprehension or significant bone loss. [2]

Patients who are at high risk and treated non-surgically after their first incident of anterior shoulder instability may have a recurrence rate as high as 86.7%. Preoperative imaging through CT and MR arthrography is important to assess glenoid bone loss. Proper preoperative planning, along with understanding the patient’s expectations, is crucial. For cases where glenoid bone loss is minimal, arthroscopic shoulder stabilization is usually sufficed with a reported recurrence rate of about 4%. However, for patients with more than 20% glenoid bone loss, open stabilization procedures are generally recommended. [3]

Arthroscopic stabilization is effective in most cases of anterior shoulder instability, but patients with significant bone lesions have a higher risk of recurrence and may need open procedures for proper stabilization. Studies have shown that arthroscopic treatment is appropriate for instability cases with less than 20% glenoid bone loss. However, patients with 10% to 20% glenoid bone loss may require additional procedures such as Remplissage for an engaging Hill-Sachs lesion or double row capsule-labral repair to restore the normal labral insertion. For patients with more than 20% glenoid bone loss, open stabilization is necessary, particularly with ORIF if possible or open Latarjet procedure. [3]

Although arthroscopic capsule-labral repair is increasingly being used as the primary treatment for traumatic recurrent anterior shoulder instability, open approaches are still considered reliable and well-established options that are often considered the best choice. Despite significant advancements in arthroscopic technique, cases involving significant bone loss, soft-tissue deficiencies, and revision situations often require open approaches. [4]

The treatment approach for shoulder instability should be customized based on the patient's job, sports involvement, and the severity of instability. [5] A comprehensive evaluation of the patient's health, shoulder condition, and activity level can be achieved by using validated outcome measures, which provide a thorough assessment of the outcome. [6] The majority of patients who underwent the Open Latarjet technique for recurrent anterior shoulder dislocation achieved a very good functional outcome, indicating that it is a reliable and safe treatment option. [7]

During the recovery period after surgery, none of the patients experienced a complete dislocation of their joint. However, two patients did experience partial dislocation, but it was not severe enough to require additional surgery. Overall, the Modified Bristow-Latarjet procedure is viewed as a successful surgical option for addressing the issue of repeated instability in the glenohumeral joint. [8] 20 (57.14%) patients had excellent functional outcomes and 15(42.85%) had good outcomes. Recurrent instability was not noted. For anterior shoulder instability Latarjet procedure is safe and effective management option. In majority of patients, we achieved good and excellent functional outcomes. [9] From 29 patients. 1 had dislocation again, 2 had shoulder subluxation, 24 returned to play out of which 17 had higher or same activity level. No need to revise surgery in any patient and good satisfaction rates. After all there were low complications [10] 75% of patients were satisfied and had satisfactory Walch-duplay score. Following arthroscopic Bankart repair significant number had recurrent instability as described in other studies too. [11]

In the literature the open Bankart and arthroscopic repair for shoulder instability has comparable clinical outcomes at a follow up of 13 years. Cuff arthropathy and recurrent dislocation should be considered as modifiable risk factors. Repair after recurrent dislocations had poor outcomes than the single dislocation.[12] In 20 years or older patients with 3 or more anchor sutures we found good long-term results. approximately 22% was the result of recurrent shoulder instability [13]

Despite high rate of instability and revision surgeries excellent long term functional outcomes have been seen in arthroscopic Bankart repair.[14]

Bankart group as compared to Latarjet group had significantly higher of revision and instability occurred in 20 (57%) shoulders in Bankart group and 2 (6%) in Latarjet group. Latarjet is recommended in adolescent population for anterior shoulder instability because Bankart repair has high rate of failure in this age group. [15] In longer follow-up recurrent dislocation will be less in Latarjet group. Lower risk of infection in in Bankart repair. in terms of post operative hematoma formation, revision rate, Rowe score had comparable results in both procedures. [16]

Conclusion

Despite advances in arthroscopic techniques which requires considerable expertise & demands expenses, in Arthroscopic Bankart repair, Latarjet procedure offers a comparable result with less expenditure. We recommend further comparative studies to assess long term follow-ups.

Conflict of Interest

The authors have no financial or non-financial interest in the subject matter or materials described in this study, nor is any author linked or involved in any way in any organization that may have any interest.

Ethical Consideration

The information to be obtained from the target population will be kept confidential. Every ethical aspect will be kept under consideration.

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Availability of Data and Materials

The patients' data will be acquired from the database registry of Dr. Ziauddin Hospital with permission of the involved authorities.

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