

Original Research Article

Functional Outcome of Open Latarjet Procedure for Recurrent Anterior Shoulder Instability with Hill-Sachs Lesion Following Sports Injury

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Abstract: Background: The anatomical and biomechanical factors render shoulder joint the most unstable and frequently dislocated joint. Anterior instability is common and glenoidal bony defect result in recurrence. Effective surgical treatment is crucial to restore the normal functioning shoulder and return to the preinjury state. The aims of this study were to assess the functional outcome of recurrent anterior shoulder instability with Hill-Sachs lesion following Latarjet procedure by ROWE score and report complications if any. **Method:** This prospective observational study included 30 patients diagnosed with recurrent anterior shoulder instability following sports injury from January 2025 to December 2025 in NITOR. Convenient sampling technique was applied and patients underwent open Latarjet procedure and followed up at 3rd week, at 6th week, at 3rd month and 6 monthly intervals for 1 year. In each postoperative follow-up, ROWE score of the operated shoulder was done and complications were noted. **Results:** The median age of the patients was 23.7 years; 63% were between 18-23 years age group. 26(87%) were male and 4(13%) females. Majority of the patients were students. High intensity contact sports, football and kabaddi, resulted in 60% cases of instability. 24(80%) had right shoulder involvement. The median number of dislocations before surgery was approximately 7 and interval between 1st episode and surgery was approximately 18 months. Range of motion and ROWE score had significant improvement ($p < 0.001$) after surgery and 77% did not present with any complications till last follow-up. **Conclusion:** Recurrent anterior shoulder instability with Hill-Sachs lesion is common in young individuals involved in contact sports. Surgical treatment with open Latarjet procedure improved range of motion and functional status of the patients with minimal complications. **Keywords:** Latarjet procedure, recurrent instability, anterior, Hill-Sachs, sports.

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INTRODUCTION

The unconstrained nature of the shoulder joint allows greatest range of motion but at the expense of stability compared to any other joint of the body. [1] It accounts for 50% of all joint dislocations. [2] The anterior instability occurs in 97% cases and results from a contact event or fall with outstretched arm with the shoulder in abduction and external rotation. [3,4] Young active people from late teenage to mid-thirties are affected. [5,6] Bankart and Hill-Sachs lesion are pathological changes associated with recurrent anterior shoulder instability. The Bankart lesion represents antero-inferior labral detachment from the glenoid with an associated capsuloligamentous injury below the equator of the glenoid. [7] Hill-Sachs lesion is an osseous defect of the postero-lateral humeral head and is noted in almost all the patients with recurrent anterior shoulder instability. [8] Rutgers *et al.*, [9] stated that the proportion of Hill Sachs was 85% in recurrent dislocations. The presence of lesion necessitates surgical intervention to stabilize the gleno-humeral joint and prevent recurrent anterior instability. [10] Considering the economic status of the patient, stability of the joint and range of motion, the Latarjet procedure has an upper edge compared to Arthroscopic Bankart procedure. [10] Arthroscopic procedure has been reported to have a higher rate of shoulder instability as high as 49% in young active individuals and its effectiveness decrease over time. [11,12] The purpose of this study is to assess the functional outcome of recurrent anterior shoulder instability with Hill-Sachs lesion following Latarjet procedure by ROWE score and report complications if any.

METHODOLOGY & MATERIALS

This was a prospective observational study involving 30 patients diagnosed with recurrent anterior shoulder instability with Hill-Sachs lesion following sports injury conducted in NITOR, Dhaka from January 2025 to December 2025. Ethical clearance of the study (no. 2081) was obtained according to Declaration of Helsinki and informed consent were obtained prior to surgery. The patients were selected by convenient sampling technique and diagnosis was based on history, clinical examination of shoulder, and radiology.

Inclusion criteria: 1. patient's age range 18-40 years, 2. presence of Hill Sachs lesion in radiology of involved shoulder and 3. history of sports injury. Exclusion criteria were: 1. non-traumatic causes such as epileptic fits, connective tissue diseases, 2. associated fractures, and 3. posterior shoulder instability. Patient's history included demographic data age, gender, occupation and type of sports played. Clinical variables included side predilection, number of dislocations before surgery, time interval between 1st episode and surgery, and preoperative range of motion. Radiology included true antero-posterior (A/P) view, skyline view of the involved shoulder and MRI scan. The ROWE score

based on stability, range of motion and function is graded as excellent (90-100), good (75-89), fair (51-74) and poor (<50).

Procedure: The patient was placed in supine position in the operation table and general anaesthesia was used. A vertical incision was made extending from the tip of the coracoid extending 5cm toward anterior axillary fold. (Figure 1) Careful dissection through deltopectoral interval exposed the cephalic vein and the vessel was retracted laterally with deltoid muscle. This exposed the coracoid process. (Figure 2) The arm was abducted and externally rotated and a Hohmann retractor was placed over the top of coracoid process laterally. Coracoacromial and coracohumeral ligament was exposed and electrocauterized to release 1cm from coracoid attachment. The arm was adducted and internally rotated to expose the medial aspect of coracoid process, and to release pectoralis minor attachment with electrocautery. Caution was taken not to release beyond the tip and hamper blood supply of the graft. Right at the colligation between vertical and horizontal aspects, coracoid osteotomy was done perpendicularly to the coracoid process to obtain 2.5cm to 3cm graft. (Figure 3) The soft tissue was removed from the inferior surface of the cut bone using a scalpel and inferior cortex was removed to create a flat bone surface so that it can be opposed to antero-inferior glenoid surface later. (Figure 4) With the arm externally rotated, subscapular split was done horizontally at the junction of the superior 2/3rd and inferior 1/3rd. (Figure 5) The anterior gleno-humeral capsule was exposed and vertical capsulotomy exposed anterior glenoid.

A Fukuda retractor was then positioned at the humeral head. The antero-inferior labrum and periosteum was excised. The antero-inferior cortex of glenoid was freshened using a bone file to create a flat cancellous bed for coracoid graft placement. Two drill holes were made using cannulated 3.2mm drill bit in the central axis of the coracoid graft 1 cm apart. The graft was then placed over the antero-inferior glenoid articular surface and k-wires were advanced into the glenoid. The graft position was checked for lateral overhang. A depth gauge was used to measure screw length and 4mm cannulated cancellous screws with washer were introduced for definite fixation. (Figure 6) With the arm externally rotated, the stump of coracoacromial ligament was repaired and then the subscapularis split repaired with adsorbable sutures. Finally, the wound was closed keeping a drain. Postoperative follow-up and rehabilitation: The patients were followed up at 3rd week, at 6th week, at 3rd month and 6 monthly intervals for 1 year. In each follow-up, the shoulder was evaluated functionally by ROWE score and documented in data collection sheet.

1st postoperative day (POD): Active finger, wrist, elbow movement was started. Pendular shoulder exercises was advised.

After 48 hours: Drain was removed

12th POD: Stitches were removed.

3rd week: Assisted forward flexion and abduction up to 90°

6th week: External rotation started. Forward flexion and abduction beyond 90° initiated carefully.

3rd month: Terminal stretching exercises added.

6th month: Full weight-bearing and return to sports activity.

Statistical analysis: A predetermined questionnaire was used to collect data. The data was checked, edited and compiled and then entered into SPSS version 26. for Windows (IBM Corporation, New York). Outlier was identified and corrected. Variables were descriptively expressed by frequency, percentage, median and IQR. Normality of data set was evaluated by Shapiro-Wilk test. The Wilcoxon signed Ranks test was performed for analyzing change of continuous variables from pre- to post-operative status. A p-value of less than 0.05 was considered as statistically significant.



Figure 1: Incision landmark for Latarjet surgery



Figure 2: Reflected Pectoralis major and Deltoid muscle reveal coracoid and conjoint tendon



Figure 3: Osteotomized coracoid process



Figure 4: Coracoid preparation



Figure 5: Subscapsularis split



Figure 6: Screw insertion through splitted subscapsularis for coracoid fixation in antero-inferior glenoid



Figure 7: MRI coronal section of right shoulder (T2 weighted image)

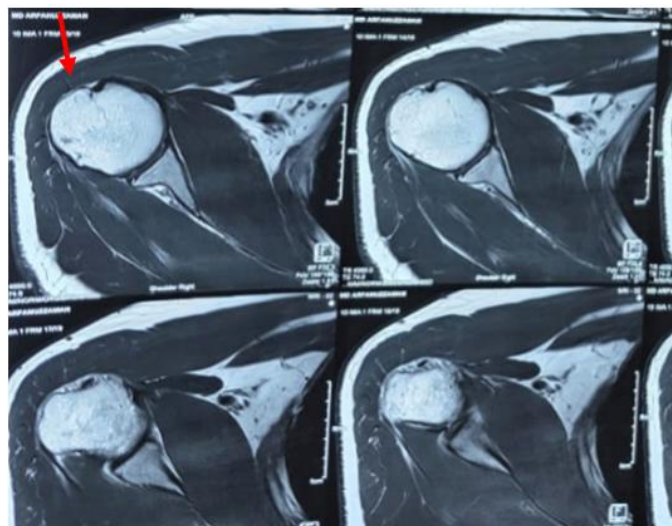


Figure 8: MRI axial section of right shoulder (T2 weighted image)

* Red arrow indicates Hill Sachs lesion

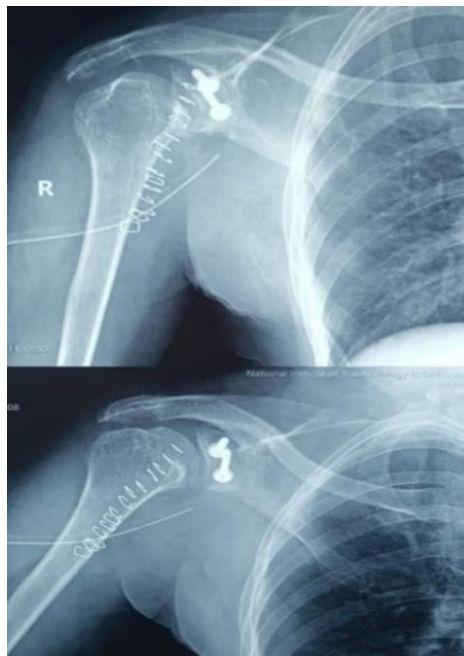


Figure 9: Postoperative X ray of right shoulder antero-posterior view showing fixation of coracoid process in antero-inferior glenoid

RESULTS

The median age of the patients was 23.7 years. Nineteen patients (63.4%) of the patients were between 18-23 years. Male patient was predominant and female: male ratio was 0.15. Most of the patients were students (87%). High intensity sports accounted for shoulder instability. The most common cause was football 15 (50%) followed by 6 cases of badminton (20%), 3 cases of kabaddi (10%) and 2 cases (6.7%) of hockey, gymnastics and volleyball each. There was more right shoulder involvement (80%) compared to left (20%). Sixteen patients (53.3%) had suffered recurrent shoulder dislocation 6-8 times before consultation. Ten patients

(33.3%) had 3-5 times and 4 patients (13.4%) had 9-11 episodes. Twenty-one patients (70%) had surgery 12-18 months after the first episode. (Table I) There was significant improvement ($p < 0.001$) between preoperative and postoperative range of motion on last follow-up. (Table II) All patients (100%) had poor ROWE score (< 50) before surgery. Following Latarjet procedure, 15 patients (50%) had excellent result, 13 patients (43.3%) good result and only 2 patients (6.7%) had fair result. The result was significant ($p < 0.001$) (Table III). Regarding postoperative complication, 3 patients (10%) had mild pain, 2 patients (6.5%) had movement restriction and 2 patient (6.5%) had neuropraxia (Figure 10).

Table I: Demographics and clinical variables of the study patients (n=30)

Demographics				
Age group (years)	n	%	Median with IQR	
18-23	19	63.4	23.7 ± 3.8	
24-29	7	23.3		
30-35	4	13.3		
Gender Distribution				
Male	26	87		
Female	4	13		
Occupation				
Students	26	87		
Service holder	4	13		
Type of sports				
Football	15	50		
Badminton	6	20		
Kabaddi	3	10		
Hockey	2	6.7		
Gymnastics	2	6.7		
Volleyball	2	6.6		
Clinical variables				
Side predilection				
Right	24	80		
Left	6	20		
No. of episodes before surgery				
3-5	10	33.3	6.6 ± 1.8	
6-8	16	53.3		
9-11	4	13.4		
Time interval between 1 st episode and surgery(months)				
12-18	21	70	18.2 ± 4.1	
19-24	6	20		
25-30	3	10		

Table II: Pre and postoperative mean range of motion (n=30)

Movement (in degree)	Preoperative median (IQR)	Post-operative median (IQR)	P value
Abduction	130 (120-140)	160 (150-160)	<0.001
External rotation	45 (30-60)	70 (60-80)	<0.001
Internal rotation	30 (30-40)	55 (50-60)	<0.001

The Wilcoxon signed Ranks test was performed for analyzing change of continuous variables from pre-to post-operative status. A p-value of less than 0.05 was

considered as statistically significant. IQR=Interquartile range

Table III: Pre and postoperative ROWE Score (n=30)

ROWE Score	Pre-operative		Post-operative		P value
	n	%	n	%	
Excellent (90-100)	0	0	15	50	
Good (75-89)	0	0	13	43.3	
Fair (51-74)	0	0	2	6.7	
Poor (<50)	30	100	0	0	
Total	30	100	30	100	
Median (IQR)	40 (25-45)		85 (80-90)		<0.001

The Wilcoxon signed Ranks test was performed for analyzing change of continuous variables from pre-to post-operative status. A p-value of less than 0.05 was

considered as statistically significant. IQR=Interquartile range

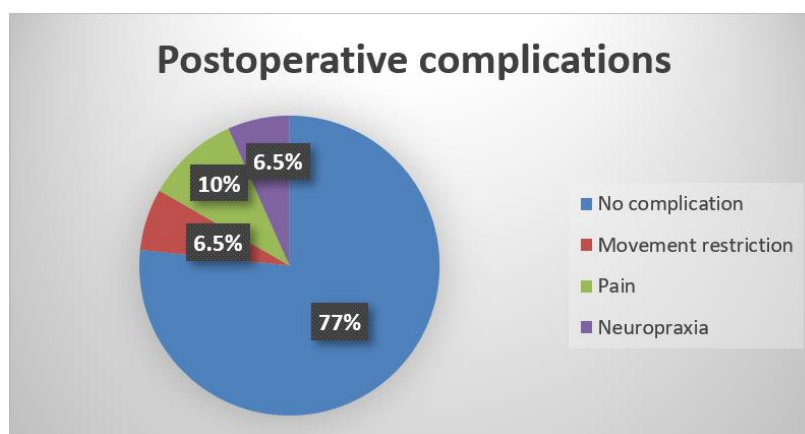


Figure 10: Percentage of postoperative complications

DISCUSSION

The primary goal of the Latarjet procedure is to prevent recurrent instability, improve functional return to pre-injury level and reduce long term complications. The median age of presentation in our study was 23.7 years and 63% of the patients were between 18-23 years age range. Sridharan *et al.*, [13] and Giles *et al.*, [14] showed similar results in their study. The male: female ratio was 0.15 with male predominance (87%) which coincides with the literature. [10,13,15-17] In our study, 87% were students and were actively involved in sports such as football, kabaddi, and hockey (66.7%). There are literatures stating that contact and limited contact sports in young individuals play active role in recurrent anterior shoulder instability. [13,15,18,19] Eighty percent of our patients had right side involvement which was the dominant side. This is supported by the literature which highlight similar finding regarding dominant limb involvement. [10,15,20]

Prasanth and Mahesh [15] in their study had a mean score 5.13 ± 2.08 regarding dislocations prior to surgery. Joshi *et al.* [16] had a mean of 3.66 ± 1.49 . Our calculated (median with IQR) dislocation before surgery was 6.6 ± 1.8 which was relatively near to the literatures. [15,16]

The median time interval between 1st episode and surgery was 18.2 ± 4.1 months; 70% patient was within the 12-18 months and 20% within 19-24 months. So, 90% of the patients were within 12-24 months range. This finding coincides with Joshi *et al.*, [16] with calculated mean time interval of 17.79 ± 4.5 months and fell within 12-24 months range between 1st episode and surgery.

Significant improvement in range of motion was noted following Latarjet procedure in our study ($p < 0.001$). Similar findings were documented by Joshi *et al.*, [16] Elganainy and El-Nour [21] and Zhu *et al.*, [22] where significant improvement was documented with respect to abduction, external rotation and internal rotation.

Postoperative mean functional outcome measurement with ROWE score after 12 months revealed a significant improvement compared to preoperative levels ($p < 0.001$). Prasanth and Mahesh [15] had significant improvement in ROWE score in their study ($p < 0.0001$) following Latarjet procedure in recurrent shoulder dislocation. Joshi *et al.*, [16] discussed improvement in functional outcome with ROWE score where the patients who played contact sports had excellent response to the surgery with good range of motion. Sharma, Singh and Sharma [20] calculated significant improvement in ROWE score ($p < 0.0001$) in their study after a period of 12 months. Chaudhary *et al.*, [23] reported that 30 patients treated with the Latarjet procedure had headed back to their work place and ROWE score assessment revealed favorable outcome with respect to function ($p = 0.034$).

In our series, 77% patients had no complications. No cases of dislocation after surgery and wound or graft infection was documented. Patients who had mild pain were managed with NSAIDS and rest to the operated limb using elbow sling. Neuropraxia and movement restriction was not debilitating and improved in time with physiotherapy. Different literatures report different complication rates. But in most studies, joint stiffness, postoperative recurrent instability, neuropraxia and infection were not significant and was managed with medication and physiotherapy. [15,16,17,24]

Limitations of the study

The study was of short duration and complications over longer period of time could not be assessed.

CONCLUSION

The Latarjet procedure is an effective surgical procedure for recurrent anterior shoulder instability with Hill-Sachs lesion for young individuals involved in sports. The data revealed significant improvement in functional outcome and low complication rates. We, therefore, recommend this technique for athletic

individuals who has limited affordability and in centers with limited resources.

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Conflicts of Interest: There are no conflicts of interest.

REFERENCES

- Hardy A, Sabatier V, Laboudie P, Schoch B, Nourissat G, Valenti P, *et al.*, Outcomes after Latarjet procedure: patients with first-time versus recurrent dislocations. *Ame J Sp Med*. 2020;48(1):21-6
- Hovellius L. Incidence of shoulder dislocation in Sweden. *Clin Orthop Relat Res*.1982; 166:127-131.
- Hovellius L, Augustini BG, Fredin H, Johansson O, Norlin R, Thorling J. Primary anterior dislocation of the shoulder in young patients. A ten-year prospective study. *J Bone Joint Surg Am*. 1996; 78(11):1677-84.
- Farrar NG, Malal JJ, Fischer J, Waseem M. An overview of shoulder instability and its management. *Open Orthop J*. 2013; 7: 338-46.
- Arner JW, Peebles LA, Bradley JP, Provencher MT. Anterior shoulder instability management: indications, techniques, and outcomes. *Arthroscopy* 2020; 36: 2791-3.
- Donohue MA, Mauntel TC, Dickens JF. Recurrent shoulder instability after primary Bankart repair. *Sports Med Arthrosc Rev*. 2017;25(3):123-130
- Clavert P. Glenoid labrum pathology. *Orthop Traumatol Surg Res*. 2015;101(1):S19-24.
- Provenches MT, Frank RM, Le Clere LE, Metzger PD, Ryu JJ, Bernhardson A, *et al.*, The Hill-Sachs lesion: diagnosis, classification and management. *Journal of the American Academy of Ortho Surgery*. 2012; 20(4): 242-52.
- Rutgers C, Verweij LPE, Priester-Vink S, van Deurzen DFP, Maas M, van den Bekerom MPJ. Recurrence in traumatic anterior shoulder dislocations increases the prevalence of Hill-Sachs and Bankart lesions: a systematic review and meta-analysis. *Knee Surg Sports Traumatol Arthrosc*. 2022;30(6):2130-2140.
- Ballal MM, Chidananda KJC, Muthu KM, Nagegowda KN. Functional outcome of open latarjet procedure for recurrent anterior shoulder instability: A prospective study. *Int J Orthop Sci*. 2021;7(2):121-7.
- Delgado C, Calvo E, Martínez-Catalán N, Valencia M, Luengo-Alonso G, Calvo E. High long-term failure rates after arthroscopic Bankart repair in younger patients with recurrent shoulder dislocations: A plea for early treatment. *Knee Surg Sports Traumatol Arthrosc*. 2025;33(3):1044-1054.
- Min SH, Topaz M, Lee C, Schnall R. Understanding changes in mental health symptoms from young-old to old-old adults by sex using multiple-group latent transition analysis. *Geroscience*. 2023; 45(3): 1791-1801.
- Sridharan M, Patel A, Katayama E, Swinehart D, Rauck RC, Cvetanovich GL, *et al.*, Clinical Outcomes Affecting Return to Play Following Latarjet Procedure in Young Contact and Limited Contact Athletes. *Orthop J Sports Med*. 2024 Aug 20;12(8):23259671241265029.
- Giles JW, Degen RM, Johnson JA, Athwal GS. The Bristow and Latarjet procedures: why these techniques should not be considered synonymous. *J Bone Joint Surg Am*. 2014 Aug 20;96(16):1340-8.
- Prashanth BN, Mahesh M. Clinical outcomes of primary Latarjet technique in recurrent shoulder dislocation using BioLatarjet® LCS cannulated flat head screws. *Int J Res Orthop [Internet]*. 2023 Jun. 29 [cited 2025 Dec. 10]; 9(4):751-6. Available from: <https://www.ijoro.org/index.php/ijoro/article/view/2728>
- Joshi S, Rao V, Shetty UC, Rai S, Arora S, Kumar SR. Functional Outcome of Open Latarjet Procedure in Non-Athletic Middle-Aged Patients. *Malays Orthop J*. 2021;15(2):151-158.
- Smith WR, Pfeil AN, Coker MA, Doehrmann R, Mathews A, Fukuda D, *et al.*, Long-term outcomes of the Latarjet procedure in a North American population. *JSES Int*. 2025; 9(5):1437-1442.
- Baverel L, Colle PE, Saffarini M, Anthony Odri G, Barth J. Open Latarjet Procedures Produce Better Outcomes in Competitive Athletes Compared with Recreational Athletes: A Clinical Comparative Study of 106 Athletes Aged Under 30 Years. *Am J Sports Med*. 2018; 46(6):1408-1415.
- Belangero PS, Lara PHS, Figueiredo EA, Andreoli CV, de Castro Pochini A, Ejnisman B, *et al.*, Bristow versus Latarjet in high-demand athletes with anterior shoulder instability: a prospective randomized comparison. *JSES Int*. 2021; 5(2):165-170.
- Sharma N, Singh V, Sharma A. Latarjet procedure for recurrent anterior shoulder instability: 2-Year outcomes in patients with minimal glenoid bone loss. *Journal of Orthopaedic Reports*. 2024; 3(4): 100341
- Elganainy AE, El-Nour MA. Latarjet reconstruction in patients with anterior shoulder instability and significant Hill-Sachs lesion. *Acta Orthop Belg*. 2017;83(3):421-427.
- Zhu Y, Jiang C, Song G. Arthroscopic versus open Latarjet in the treatment of recurrent anterior shoulder dislocation with marked glenoid bone loss: A prospective comparative study. *Am J Sports Med*. 2017;45(7):1645-1653.
- Chaudhary D, Goyal A, Joshi D, Jain V, Mohindra M, Mehta N. Clinical and radiological outcome after mini-open Latarjet technique with fixation of coracoid with Arthrex wedge mini-plate. *J Clin Orthop Trauma*. 2016;7(1):23-9.
- Domos P, Lunini E, Walch G. Contraindications and complications of the Latarjet procedure. *Shoulder Elbow*. 2018;10(1):15-24.

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