

A Prospective Evaluation of the Open Latarjet Surgery for Recurrent Anterior Shoulder Instability

Anshu Anand¹, Ajoy Kumar Manav²

¹Senior Resident, Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India

²Associate Professor, Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India

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Corresponding author: Dr. Anshu Anand

Conflict of interest: Nil

Abstract

Aim: The aim of the study to determine the Functional outcome of open Latarjet procedure for recurrent anterior shoulder instability. **Methods:** 50 patients with Bony Bankart's lesion representing $\geq 25\%$ of glenoid lesion, Hill Sacs lesion, On track lesion with glenoid bone loss of $\geq 25\%$, Off track lesion with glenoid bone loss $< 25\%$, Lesions requiring Remplissage correction along with Latarjet procedure were included in this study. Functional scoring of the patient was determined by ASES (The American Shoulder and Elbow Surgeons) score, Quick DASH (The Disabilities of Arm, Shoulder and Hand) score, Rowe score, ISIS (Injury Severity Index Score score) and Visual analogue scale (VAS) for pain to get a baseline reference. The case was treated with open Latarjet repair after the criteria were met. In which coracoid process along with the conjoint tendon is transferred and fixed with screws to the margin of glenoid. **Results:** A total of 50 patients were evaluated in the study whose mean age was 33.22 (+/- 8.12) years. 20 patients were less than 25 years (40%); 27 were between 25-40 years (54%) who were the majority and 3 were above 40 years (6%). All the patients in my study were males except for 2 females. Of total 50 patients 45 were male (90%) with a female (10%). Among 50 patients, 30(60%) patients had their dominant shoulder affected and remaining 20 (40%) had recurrent instability in their non-dominant shoulder. Mean VAS (Visual analogue scale) for pain among the patients in the study also reduced from pre-op value of 5.3 to 2.8, 1 and almost 0 at 1 month, 3 months and 6 months post- op respectively and this reduction in pain was found to be highly significant. The American Shoulder and Elbow Surgeons (ASES) Shoulder Score which is both a physician-rated and patient- rated scoring system showed a significant improvement at post-op follow ups. The post-op scores at 1 month, 3 months and 6 months were 67.9 (+/-8.1), 82.4 (+/-5.1), and 92.3 (+/- 5.3) respectively. The mean pre-op ASES score was 46.6 (+/- 5). The Quick DASH (The Disabilities of Arm, Shoulder and Hand) score also showed good improvement in patient satisfaction and ROM, with postop scores at 1 month, 3 months and 6 months being 31.8 (+/-8), 20.1 (+/-7.3), and 12.5 (+/-6.9) respectively. The mean pre-op Quick DASH score was 44.2 (+/-9.6). **Conclusion:** The Open Latarjet repair for anterior shoulder instability is a useful and successful procedure for patients with significant glenoid bone loss and heavy work demand such as contact athletes and manual labourers.

Keywords: Open Latarjet repair, glenoid bone loss, glenoid bone loss

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Introduction

The shoulder is the most unstable joint in the human body, and anterior shoulder dislocation has been reported to have an incidence of around 42 in 100,000 people/year.[1] Each anterior dislocation of the shoulder increases the risk of soft tissue and bony lesions with a subsequent higher risk of recurrence.[2,3] Bankart lesions have been reported in up to 95% of shoulders after dislocation. The other main types of lesions are bony lesions; they appear in a mirror position on the anteroinferior part of the glenoid and the posterosuperior part of the humerus. Humeral lesions as described by Malgaigne occur in 47% to 90% of dislocated shoulders.[4,5]

Bankart repair remains a popular option, but it addresses only soft tissue deficiency using suture anchors. However, the situations involving irreparable ligamentous damage or bony deficiency, this technique may be insufficient to stabilize the shoulder. The Latarjet procedure is a reliable method of treatment for anterior instability, with good results reported in many studies.[6-8] It is effective in situations in which soft-tissue reconstruction is not a reasonable option.[9] The use of the coracoid process to stabilise the shoulder was first described by Oudard[10] in 1923. The screwing of the coracoid process on to the antero-inferior side of the glenoid at the level of the anterior glenoid rim was described by Latarjet[11] in 1954. Helfet[12] in 1958 described the Bristow procedure in which the coracoid process was merely sutured to the anterior part of the scapular neck through a transversally sectioned subscapularis muscle. Mead and Sweeney[13] in 1964, and May[14] in 1970, described a modification of the Bristow Helfet procedure that consisted of fixing the bone block to the anterior glenoid rim with a screw. In mini-open technique incision is limited to 4- 5 cm and when it is

possible to 3 cm. In this technique we do not cut the subscapularis tendon but we split the tendon at its distal edge in order to place the bone block in right position. This allows a fast recovery without any post-operative immobilization.

Materials and methods

A retrospective study was conducted in the Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India from January 2018 to December 2018, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient or the relatives. 50 patients with Bony Bankart's lesion representing $\geq 25\%$ of glenoid lesion, Hill Sacs lesion, On track lesion with glenoid bone loss of $\geq 25\%$, Off track lesion with glenoid bone loss $< 25\%$, Lesions requiring Remplissage correction along with Latarjet procedure were included in this study. Posterior instability of shoulder, Any anterior dislocation along with any associated fracture, Recurrent anterior instability associated with irreparable rotator cuff lesions, Voluntary anterior dislocators or subluxators, Patients with uncontrolled epilepsy, Prosthetic anterior instability, Connective tissue disorders such as Ehlers-Danlos, Marfans syndrome were excluded from this study.

Functional scoring of the patient was determined by ASES (The American Shoulder and Elbow Surgeons) score, Quick DASH (The Disabilities of Arm, Shoulder and Hand) score, Rowe score, ISIS (Injury Severity Index Score score) and Visual analogue scale (VAS) for pain to get a baseline reference.[15] The case was treated with open Latarjet repair after the criteria were met. In which coracoid process along with the conjoint tendon is transferred and fixed with screws to the margin of glenoid. This procedure provides stability by Bony effect, Bankart effect and

dynamic sling effect. Rehabilitation is always customised based on the tissue quality, stability of the repair. Phased rehabilitation is followed.[16] Follow up scores will be taken at weeks 2,1-month,3 months and 6 months to assess functional outcome of the repair. Results were analysed and interpreted using appropriate statistical analysis by using SPSS 21.0 software.

Results

A total of 50 patients were evaluated in the study whose mean age was 33.22 (+/-8.12) years. 20 patients were less than 25 years (40%); 27 were between 25-40 years (54%) who were the majority and 3 were above 40 years (6%).table 1 All the patients in my study were males except for 2 female. Of total 50 patients 45 were male (90%) with a female (10%). Among 50 patients, 30(60%) patients had their dominant shoulder affected and remaining 20 (40%) had recurrent instability in their non-dominant shoulder. The majority of the patients were involved in some form of sports activity with 20 patients (40%) playing contact sports (mostly kabaddi) and 21 patients (42%) playing recreational sports (badminton, volleyball, cricket). 9 patients (18%) had no history of any sporting activity. Majority of the patients in the study had a minimum of 4 dislocations prior (N-13, 26%); Ranging from minimum of one to maximum of ten dislocations prior. With 5 (10%), 3 (6%), 9 (18%), 9(18%), 4 (8%), 4 (8%), 3 (6%) patients having had 1,2, 3, 4, 6, 7 and 10 dislocations prior to reporting respectively. Pre-operative Injury Severity Index Score (ISIS) of the patients were determined. It was found that mean pre- operative ISIS score was 4.01. 2 (4%), 21 (42%), 14 (28%), 7 (14%), 6 (12%) patients had an ISIS score of 2, 3, 4, 5, and 6 respectively. An ISIS score of < 3, 3 – 6 and > 6 predicts a recurrence rate of 5%, 12%, and 72%, respectively.

Forward Elevation (FE), Cross-Body Adduction (CBA), External Rotation with arm in adduction (ER1), External Rotation with arm in 90-degree abduction (ER2) and Internal 6 months follow up – Rotation (IR) movements were calculated pre-op, follow-ups at 1 month, 3 months and 6 months. There was a significant improvement post-surgery and explained in table 1 and table 4.

Mean VAS (Visual analogue scale) for pain among the patients in the study also reduced from pre-op value of 5.3 to 2.8, 1 and almost 0 at 1 month, 3 months and 6 months post- op respectively and this reduction in pain was found to be highly significant. Table 2

ROWE score which takes into account the stability, motion and function of the patient was found to have a highly significant improvement with follow ups at 1 month, 3 months and 6 months with scores of 54.68 (+/- 9.43), 69.59 (+/- 7.83) and 91.59 (+/- 7.2.) respectively. Majority of the patients (N-46; 92%) had excellent functional outcome and 4 patients (8%) had fair outcome.

The American Shoulder and Elbow Surgeons (ASES) Shoulder Score which is both a physician-rated and patient- rated scoring system showed a significant improvement at post-op follow ups. The post-op scores at 1 month, 3 months and 6 months were 67.9 (+/-8.1), 82.4 (+/-5.1), and 92.3 (+/- 5.3) respectively. The mean pre-op ASES score was 46.6 (+/- 5). table 3.

The Quick DASH (The Disabilities of Arm, Shoulder and Hand) score also showed good improvement in patient satisfaction and ROM, with postop scores at 1 month, 3 months and 6 months being 31.8 (+/-8), 20.1 (+/-7.3), and 12.5 (+/-6.9) respectively. The mean pre-op Quick DASH score was 44.2 (+/-9.6).

Table 1: gender and age distribution

| Gender | Number | Percentage |
|--------------|--------|------------|
| Male | 45 | 90 |
| Female | 5 | 10 |
| Age in years | | |
| Below 25 | 20 | 40 |
| 25-40 | 27 | 54 |
| Above 40 | 3 | 6 |

Table 2: Visual Analogue Score

| VAS parameter | Mean |
|-----------------|------|
| PRE OP | 5.3 |
| POST OP 1 MONTH | 2.8 |
| POST OP 3 MONTH | 1.3 |
| POST OP 6 MONTH | 0 |

Table 3: Mean ASES Score

| ASES Score parameter | Mean |
|----------------------|------|
| PRE OP | 46.6 |
| POST OP 1 MONTH | 67.9 |
| POST OP 3 MONTH | 82.4 |
| POST OP 6 MONTH | 92.3 |

Table 4: Range of movements (Forward Elevation-FE, Cross-Body Adduction-CBA, External Rotation with arm in adduction-ER, External Rotation with arm in 90-degree abduction-ER2 and Internal Rotation-IR, SD-Standard deviation, Sig – Significant)

| Range of Movements | FE | | | CBA | | | ER1 | | | ER 2 | | | IR | | |
|--------------------|-------|------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|------|-----|
| | Mean | SD | p | Mean | SD | P | Mean | SD | p | Mean | SD | p | Mean | SD | p |
| Pre-Op | 145.3 | 13.5 | | 46.4 | 5.6 | | 55.2 | 9.1 | | 76 | 4.6 | | 54.2 | 7.62 | |
| Post OP 1 Month | 150.7 | 9.8 | Sig | 47.2 | 4.8 | Sig | 61.5 | 7 | Sig | 79.8 | 3.7 | Sig | 59.2 | 3.4 | Sig |
| Post OP 3 Months | 152.1 | 7.4 | Sig | 51 | - | Sig | 66.8 | 5.3 | Sig | 89.2 | 8.1 | Sig | 67.3 | 3.5 | Sig |
| Post OP 6 Months | 157.7 | 8.2 | Sig | 51 | - | Sig | 70.1 | 3.2 | Sig | 92.1 | 7.4 | Sig | 70.2 | 2.8 | Sig |

Discussion

Anterior glenohumeral dislocation followed by chronic anterior instability is the most common form of glenohumeral instability.[17] This is one of the most common situations in our orthopaedic practice. Rowe *et al* reported a 95.6% rate of anterior dislocation was caused due to trauma in their study of 500 patients.[18] Though the most common type of lesion involved is Bankart's lesion.[19] The prevalence of fracture or erosion of the glenoid rim in shoulders with recurrent anterior dislocation has been reported to

range from 8% to 95%.[20-30] and cases are on rise as time fleets due to recent enthusiasm for recreational and sporting activities, especially among young and active population.

The primary goal of any stabilisation procedure is to prevent recurrent instability with the goal of improving function, return to pre injury levels and to reduce long term sequelae. It is obvious that anatomic repair of the underlying pathology is the preferred procedure in anterior shoulder instabilities with Bankart lesion.[31] But, Bankart procedure is not the ideal surgery in

conditions like contact or competitive sports athletes, significant bone loss or fracture of glenoid or humeral head, chronic erosion of glenoid rim, mid substance complete tear of glenohumeral ligament, humeral avulsion of glenohumeral ligament, deficient capsule, and complete radial tear of labrum.[32-36] So, bony procedures should be performed in these patients. Here in this study, we review our experience with one such bony procedure – Open Latarjet procedure in chronic anterior glenohumeral instability meeting our criteria which was originally described in 1954. This short-term study highlights the importance of screening of patients for bone deficiency, treating them with open Latarjet procedure and evaluating their functional outcome.

Latarjet surgery is reported as good or excellent satisfied procedure in preventing the future instability because low post-operative recurrence rates of shoulder dislocation rates. According to Allain *et al.*, in their 56 patients treated with an open Latarjet procedure for a mean of 14.3 years, none of them had a recurrent dislocation and only 1 patient reported a feeling of persistent instability and occasional subluxation.[37] Cassagnaud in his series of 106 Latarjet procedures with 7.5 years of follow up reported only one re-dislocation.[38] Whereas Collin in his 69 patients with mean follow up of 50 months had 4 recurrences and 2 subluxations.[39] According to Hovelius in his prospective study of 118 patients over 15 years follow up had subluxation in 11 and recurrences in 3 patients.[40] Our study similarly had no recurrences or re-dislocations post operatively. According to Banas *et al.*, their cases showed 97% satisfaction during 8.6 years.[41] Hovelius *et al.*[40] in their 15 years follow-up and Schroder *et al.*[42] during 24.6 years showed 98 and 70% satisfaction, respectively. Most interestingly, Omid-Kashani *et al.*[43] expressed 100% satisfaction in their study with mean follow up of 24.6 months which was in comparison with our study showing

excellent satisfaction in about 90% and only 5 patients (10%) had fair outcome with Rowe scores. Showing that the outcome of this study is not far from other studies. Though many studies have reported shoulder stiffness and significant loss of external rotation after this procedure [44,45,46] we did not encounter significant joint stiffness or limitation of external rotation. According to Hovelius *et al.*[47] there was 8° mean loss of external rotation whereas Young and Walch [48] did not find any significant loss of external rotation. With 9° and 5° mean reduction in external rotation by Banas *et al.*[41] and Burkhart *et al.*[44] respectively post operatively. All these were similar to our study with mean external rotation limitation was 5° postoperatively without affecting the activities of their daily living.

Conclusion

In conclusion, this study shows that Open Latarjet repair for anterior shoulder instability is a useful and successful procedure for patients with significant glenoid bone loss and heavy work demand such as contact athletes and manual labourers.

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