

CASE SERIES

FUNCTIONAL OUTCOME OF BRISTOW-LATARJET PROCEDURE IN POST-TRAUMATIC RECURRENT ANTERIOR SHOULDER INSTABILITY

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Background: Due to its lack of bony support, the shoulder joint has the broadest range of motion out of all the joints in the body. Instead, one of the joints that dislocate most frequently is the shoulder joint. Multiple pathologic abnormalities, including the traumatic separation of the anterior-inferior capsule-labral complex from the glenoid rim, are caused by repeated anterior glenohumeral dislocation. The objective of the study is to ascertain the Bristow-LATARJET procedure's efficacy in situations of recurrent post-traumatic anterior shoulder instability. **Methods:** From 31 January 2020 to 31 July 2020, a descriptive case series was undertaken in the orthopaedic surgery department of the Lahore General Hospital. For this study, 71 patients who met the inclusion and exclusion criteria were recruited, and all interventions were conducted while the patients were lying in a beach chair while under general anaesthesia. The Delto-pectoral incision surgical technique was applied. For 12 weeks, all patients underwent clinical follow-up, and the results were documented. **Results:** There were 50(70.4%) males and 21(29.6%) females in this study & the mean age of the patients were 34.64±10.73. There were 37(52.1%) patients among them the outcome of treatment (Rowe Scale at 12th week) was excellent, among 21(29.6%) it was good, among 8(11.3%) it was fair and among 5 (7.0%) it was poor. There was a significant association between the outcome of treatment (Rowe scale at 12th week) and age groups (p-value: 0.000). **Conclusion:** The Bristow-LATARJET procedure is deemed to be a very productive, safe, and problem-free procedure for curing post-traumatic reoccurring traumatic anterior shoulder instability.

Keywords: Bristow-Latarjet procedure; Shoulder dislocation; Traumatic anterior shoulder instability

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INTRODUCTION

Since the shoulder joint doesn't have any significant containment mechanism, it has the greatest range of motion of any joint in the body. Instead, the shoulder joint dislocates most commonly, with a rate of 47 per 100,000 people in the USA.¹ Shoulder dislocation is usually more common in athletes due to anterior glenohumeral instability and it is recorded to affect 2.8% of young athletes per year.² The result of recurrent anterior glenohumeral dislocation is multiple pathologic lesions, which include traumatic detachment of the anteroinferior capsulolabral complex from the glenoid rim (Bankart lesion).³ Additionally, instability-related intra-articular pathology may increase the risk of inferior outcomes after initial treatment, including labral tears, glenoid bone loss, Hill-Sachs lesions, capsular injuries such as humeral avulsion of the glenohumeral ligament lesions, anterior labral periosteal sleeve avulsion lesions, and rotator cuff tears.⁴⁻⁶ Several treatment

options are recommended from time to time to treat anterior shoulder dislocation. Though non-operative treatment has been recommended in some cases but it is usually associated with recurrent dislocation that can be as high as 90%.⁷ When it comes to 5 surgical treatment, Bankart⁸ described a technique that was later popularized by Rowe *et al.*⁹ Several studies have shown good results after Bankart capsulolabral repair¹⁰, but in case of bony erosion of antero-inferior margin of glenoid, there are up to 70% chances of Bankart repair failure.^{11,12} Therefore, the surgical treatment should not only allow a complete range of motion and strength but also results in a stable shoulder joint. In 1954, Latarjet described a technique to address bony defect involving the glenoid resulting in recurrent dislocation of the shoulder. A screw was used to secure the fixation of the coracoid to the scapular neck.¹³ Latter in 1958, Helfet described the Bristow procedure in which the coracoid process was merely sutured to the anterior part of the scapular neck.¹⁴ Nowadays this procedure is known as Bristow-

Latarjet operation. The principle behind shoulder stability after the Bristow-Latarjet procedure is defined by Patte which he called "triple blocking effect".¹⁵ Matthes et al., found that out of 29 patients, 59% patients had excellent Rowe score, 24% had good score (good them to excellent score in 83% cases) after Bristow-Latarjet procedure.¹⁶ The rationale of this study is to have understanding of the treatment of anterior shoulder instability with the Bristow-Latarjet procedure in terms of improvement in Rowe criteria. After careful observation of the literature 6 published so far, it is noted that no study is conducted so far on local population in-fact in Asian countries which can boost the confidence in this modality. Hence this study is planned to generate the local data related to its outcome. If we find out the good outcome in terms of the above-mentioned parameters then this method can be used on larger scale. Objective is to determine the outcome of Bristow-Latarjet procedure in cases of post-traumatic recurrent traumatic anterior shoulder instability.

Operational Definitions:

1) Bristow-Latarjet procedure: The procedure involves the transfer of distal tip of coracoid process with the attached conjoined tendon to the anterior-inferior part of rim of the glenoid.

2) Outcome: It was measured as good-excellent score by using Rowe scale after 12 weeks of treatment. This scale is based on function, stability and motion of shoulder joint. The maximum score is 100. The scale is divided into excellent (90–100), good (75–89), fair (51–74) and poor (<50) according to the score.

MATERIAL AND METHODS

Study Design was Descriptive case series conducted in Department of Orthopedics Surgery, Lahore General Hospital, Lahore during Six months after approval of synopsis i.e., 31-1-2020 to 31-7-2020. A sample size of 71 cases was calculated with 95% confidence level, 10% margin of error, and taking an expected percentage of good outcome, i.e., 24% with Bristow-Latarjet procedure in recurrent traumatic anterior shoulder instability. Sampling Technique was non-probability consecutive sampling Sample Selection: Age from 18 to 50 years, either gender and Post traumatic recurrent anterior shoulder dislocation with Bankart lesion (assessed on MRI and medical record) were included in study.

Patients with recurrent shoulder dislocation due to generalized ligamentous laxity, Ehlers-Danlos and Marfan's syndrome etc., Osteomyelitis, burn contractures neurological issues, bilateral cases, Patients with co morbidities, i.e., Diabetes Mellitus (BSG>200 mg/dl), hypertension (blood pressure >140 mmHg), renal failure (creatinine >3), and poor compliance were excluded from the study.

Seventy-one patients who met the inclusion and exclusion criteria were chosen from the orthopaedic outpatient clinic with the ethical committee's permission. Name, age, gender, lateral side, and length of prior operation were all documented as demographic details. Consent was obtained in advance after the procedure was explained. Under general anaesthesia, all procedures were carried out while sitting in a beach chair. The skin incision was made using a Delto-pectoral technique, reaching 4–5 cm from the coracoid tip toward the axillary crease.

The coracoacromial ligament was cut about 1 cm from where it was attached to the coracoid. The coracoid was decorticated using an oscillating saw to reveal the cancellous bone. In the coracoid's central axis, two holes were made with a 3.2 mm drill, spaced roughly a centimeter apart. At the intersection of its superior two-thirds and inferior one-third, the subscapularis was then splinted. Following that, the antero-inferior glenoid was exposed and decorated. The graft was then placed and fixed in the anterior inferior prepared defect using 4.5 mm partially threaded malleolar screws. This was done after a flat surface was created to place the graft, which was at the 5 o'clock position parallel to the plane of the glenoid and sufficiently medial that the coracoid was not overhanging the glenoid. Ceftriaxone (2g) Injection, as an infection prevention measure commencing prior to surgery, was administered intravenously. Clinically following each patient for a period of 12 weeks and recording their outcomes in accordance with the operational definition. Every detail was documented on a predefined Proforma.

The SPSS 23 was used to enter and evaluate the data. Quantitative information like age and the length of a prior surgery was displayed using the mean and standard deviation. Gender, side, and outcome (good-excellent) qualitative data were reported as frequency and percentage. To limit effect modifiers, data were stratified for age, gender, lateral side, and length of prior operation. To compare results in stratified groups, the post-stratification chi-square test was used. The *p*-values under 0.05 were deemed significant.

RESULTS

The mean age of the patients was 34.64±10.73 years the minimum age was 18 years and the maximum was 50 years. (Chart-1) There were 50 (70.4%) males and 21(29.6%) females in this study. (Table-1) There were 34 (47.9%) patients in which the right side was involved and 37 (52.1%) left side was involved. (Table-2) There were 37 (52.1%) patients among them the outcome of treatment (Rowe Scale at 12th week) was excellent, among 21 (29.6%) it was good, among

8(11.3%) it was fair and among 5 (7.0%) it was poor. (Table-3) The mean duration of surgery was 73.43 ± 8.65 minutes the minimum duration of surgery was 60 minutes and the maximum was 90 minutes.

There was a significant association between the outcome of treatment (Rowe scale at 12th week) and age groups as the p-value was significant. (p -value:0.000). There was an insignificant association between the outcome of treatment (Rowe scale at 12th week) and gender as the p-value was significant. (p -value: 0.017). There was no significant association between the outcome of treatment (Rowe scale at 12th week) and the affected side as the p-value was not significant. (p -value: 0.100). There was no significant association between the outcome of treatment (Rowe scale at 12th week) and duration of surgery as the p-value was not significant. (p -value: 0.496).

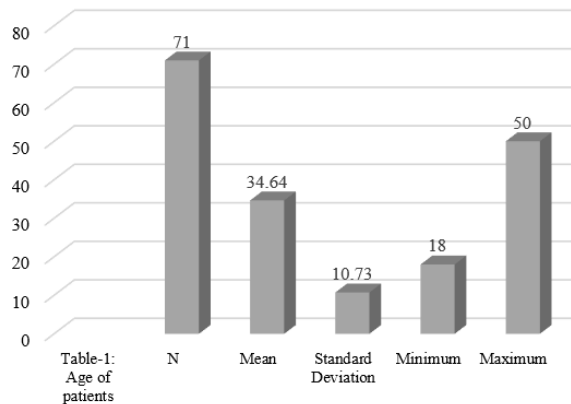


Figure 1: Age of patients

Table-1: Gender of patients

	Frequency	Percent
Male	50	70.4
Female	21	29.6
Total	71	100

Table-2: Effected Side

	Frequency	Percentage
Right	34	47.9
Left	37	52.1
Total	71	100

Table-3: Outcome of Treatment (Rowe Scale at 12th Week)

	Frequency	Percent
Excellent	37	52.1
Good	21	29.6
Fair	8	11.3
Poor	5	7.0
Total	71	100

DISCUSSION

Due to its extremely high proportion of positive clinical and functional outcomes, the LATARJET operation has Become popular among open surgical

procedures. When patients need a post-operative rehabilitation program that is completed more quickly (for example, because of employment requirements) or when complete external rotation recovery is required, the LATARJET treatment appears to be the preferred method.¹⁷ In cases of recurrent anterior glenohumeral instability attributable to the glenoid bone lesion, procedures for coracoid apophysis transfer, such as the surgeries described by LATARJET and Bristow, are frequently recommended.¹⁸ Even in patients with an ISIS (Instability Severity Index Score) of 4, Bliven *et al.* 2018 confirm that the LATARJET technique is efficient in restoring glenohumeral stability when used in conjunction with primary chronic anterior instability and when an arthroscopic Bankart repair failed.¹⁹ This is consistent with earlier research, which revealed recurrence rates after primary Latarjet between 1–11.6%,^{20,21} and around 4% when carried out as revision surgery²². Should an arthroscopic Bankart repair fail, Latarjet is still an option. In contrast, a botched Latarjet treatment is still exceedingly difficult to treat, with recurrence rates following an Eden-Hybinette procedur²³ hovering around 12% and 33% of patients having average or subpar outcomes.²⁴ The Instability Severity Index Score was put forth by Balg and Boileau 4 in 2007 to aid the surgeon in choosing between arthroscopic Bankart repair and Latarjet. A score was initially used to suggest a Latarjet.²¹

Phadnis *et al.* found that patients with an Instability Severity Index Score of 3 had a 4% probability of failure, compared to those with a score of 4, who had a 70% risk of failure.²⁵ Phadnis *et al.*²⁵ proposed decreasing it to 3 while Thomazeau *et al.*²⁶ recently reported that this threshold should even be dropped to 2, in later studies. Werthel *et al* 2020²⁷ state that the scoring scale results did not differ when male or female patients were taken into account, both in terms of subjective and objective results. In contrast, our findings differ from those of the aforementioned study because there was a significant correlation between gender and the outcome measure in our study. 0.017 as a p-value. The decrease of range of motion, particularly in ER, is one of the biggest complaints against the Latarjet procedure. However, some authors have described a loss of up to 20°. Most authors have reported a mean loss of 10–15° of ER.^{28,29} The Bristow-Latarjet surgery is the most recommended procedure for the majority of patients with this pathology, especially in those who present other risk factors for concurrent instability. The authors discovered that recurrences in Latarjet operations occurred predominantly in the first two postoperative years and then decreased, being associated with technical surgical errors. Despite the fact that it is a

non-anatomical technique with the main goal of preventing further glenohumeral dislocation episodes and despite the fact that it has been linked in some studies to the early onset of glenohumeral osteoarthritis and restrictions on shoulder mobility, it is an efficient and safe procedure with low rates of complications and recurrences that frequently results in very satisfactory functional outcomes in the medium and long term. Numerous studies have demonstrated that their functional outcomes are comparable to those of anatomical capsulolabral repair procedures and that they outperform them in terms of preventing recurrences.^{16,30,31} Bessière *et al.*²¹ observed significantly higher functional levels in patients undergoing LATARJET surgeries (mean Rowe score: 78) while in our study the Rowe score was measured categorically as in our study there were 52.1% patients with the excellent outcome (Rowe score), 29.5% were having good, 11.3% fair and 7% had poor Rowe score. According to Xu *et al.*, the Rowe score was 42.23 ± 14.20 which is almost similar to the findings in our study Rowe score was measured categorically as in our study there were 52.1% of patients with excellent outcomes (Rowe score), 29.5% were having good, 11.3% fair and 7% had poor Rowe score. On the other side, the findings of De Carli *et al* 2019¹⁷ their findings were different from the findings of our study as in their study the mean Rowe score was 95.6. However, this procedure has shown efficacy and is a valid functional option for the surgical treatment of recurrent traumatic anterior glenohumeral dislocation with varying degrees of glenoid bone defect. According to several studies, Bristow-Latarjet surgery is indicated and should only be performed in cases of glenoid bone lesions greater than 20–25%.^{31,32}

In these circumstances, some research advised selecting a different surgical procedure to prevent this problem caused by an inadequate screw fixation. According to our observations, the effectiveness of the LATARJET operation was largely due to the careful selection of patients who had tiny coracoids.³³ The Rowe score, which took into account function, motion, and stability, was utilized by Xu *et al.* in 2019³⁴ to evaluate postoperative stability. LATARJET operations might be more prudent in terms of postoperative stability.

CONCLUSION

Based on the findings of this study, it can be said that Bristow-LATARJET surgery is a very safe and successful treatment for post-traumatic recurrent traumatic anterior shoulder instability.

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