



Outcome of Latarjet Technique with low Profile Single 4.0 MM Titanium Screw and Washer for Recurrent Dislocation of Shoulder: A Prospective Study

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Abstract

Shoulder joint is one of the commonest joint to dislocate and account for majority of all the dislocations seen in the orthopaedic emergency department. Shoulder joint is prone for dislocations because of a shallow glenoid that articulates only with a small part of the humeral head. Recurrent dislocation of shoulder is also a common occurrence after first episode of dislocation and is seen more commonly in young patients having rotator cuff injuries or fracture of glenoid during initial dislocation. Management of recurrent dislocation is essentially surgical. Latarjet technique, first described by Latarjet M in 1954, is found to have excellent outcome in cases of recurrent shoulder dislocation. It consists of removal and transfer of a section of the coracoid process and its attached muscles to the front of the glenoid. The definitive graft fixation may be achieved using cortical screws and washers. We conducted this prospective study to analyze the outcome of patients having recurrent dislocation of shoulder treated by Latarjet technique using single 4.0mm titanium screw and washer.

Aims and Objectives: To study clinical outcome and complications in patients with recurrent shoulder dislocation managed with Latarjet-Bristow procedure using single 4.0 mm titanium screw and washer.

Materials and Methods: The study was carried out in department of orthopaedics in a teaching institute situated in an urban area. All patients admitted for recurrent shoulder dislocation and managed with Latarjet-Bristow procedure using single 4.0 mm titanium screw and washer were included in this study depending upon inclusion criteria. Any patient having any exclusion criteria was excluded from the study. Type of shoulder dislocation was diagnosed on the basis of imaging. X-Ray shoulder (AP view, internal rotation, external rotation and neutral position) was done in all the cases. 3 D CT of shoulder joint and MRI were done in selected cases. All patients underwent Latarjet-Bristow procedure and graft fixation was achieved using single 4.0mm titanium screw and washer. The outcome of patients was studied by analysing pre-operative and post operative Walch-Duplay and ROWE score scores.

Results: Out of 30 cases there were 22 (73.33 %) Males and 8 (26.66 %) females with a M: F ratio of 1: 0.36. The most common affected age group was found to be between 26-35 years (40%) followed by 18-25 years (33.33%) and 36-40 years (20%) and most common mechanism of injury during first episode of shoulder dislocation was found to be fall (43.33%) followed by motor vehicular accidents (40 %) and sports injury (16.66 %). In 19 (63.33 %) patients shoulder dislocation was seen on right side and in 11 (36.66 %) patients the dislocation was seen on left side. Postoperatively 27 (90%) and 26 (86.66%) patients had either excellent or good outcome on the basis of Walch-Duplay Scores and ROWE score respectively. Post operative complications were seen in 4 (13.33%) patients and included

hematoma, wound infections and nerve injury (neuropraxia) which resolved within 6 weeks.

Conclusion: In patients with recurrent shoulder dislocation Latarjet-Bristow technique using 4.0-mm titanium screw and washer for graft fixation is an excellent procedure with satisfactory outcome and low complication rates.

Keywords: Recurrent Shoulder Dislocation, Latarjet technique, Complications, Outcome.

Introduction

Shoulder joint is one of the most common joints to be dislocated and most common type of shoulder dislocation is anterior dislocation^[1]. Other types of dislocations include posterior, inferior and anterior-superior dislocations. Primary mechanism of shoulder dislocation usually involves falling from height or a direct blow causing damage to the ligaments^[2]. If the force is strong enough there may be injury or tear of the ligaments and tendons, fracture of the glenoid or humerus ultimately causing dislocation of shoulder joint. Recurrent dislocation of shoulder is common because after first episode of dislocation of shoulder joint, for whatever reason, there is a possibility of faulty healing or stretching and laxity of tissue predisposing the joint for recurrent dislocation. Various factors which may increase the chances of recurrent dislocation after initial dislocation include younger age, Patients having rotator cuff injuries or fracture of glenoid during initial dislocation^[3]. The other important cause of recurrent shoulder dislocation or shoulder instability includes injury to nerves supplying muscles of the shoulder joint specifically the axillary nerve. The patients usually present with history of trauma or sports injury. The position of the affected limb depends upon type of dislocation. In cases of anterior dislocation (The most common type) the arm is usually abducted and externally rotated^[4]. Since recurrent dislocation is common it is important to ask for history of dislocation in past. The diagnosis is usually confirmed on the basis of imaging. The plain radiographs (Anteroposterior view, orthogonal view and scapular Y view) may show dislocated shoulder and its type. 3 D CT of shoulder may more accurately define bony injuries while MRI may be more useful in diagnosing the type and severity of ligament tears, rotator cuff injuries and joint effusion^[5]. The

management of shoulder dislocation consists of prompt reduction of the glenohumeral joint in acute dislocation cases. In cases of recurrent dislocation operative interventions are usually required and may consist of either open or arthroscopic interventions depending upon the type of injury diagnosed on the basis of imaging^[6]. The major goal of the surgery is to repair or reattach the torn tissue and ligaments and also to address the tissue laxity which is commonly seen in these patients^[7].

The Latarjet technique, first described by Latarjet M, also known as the Latarjet-Bristow procedure, is commonly used to treat recurrent shoulder dislocations and involves the removal and transfer of a section of the coracoid process and its attached muscles to the front of the glenoid^[8]. The definitive graft fixation may be achieved using 3.5-mm cortical or 4.0-mm titanium screws and washers [9]. This placement of the coracoid acts as a bone block which, combined with the transferred muscles, act as a strut and prevents further dislocation of the shoulder^[10].

We conducted this prospective study of 30 patients with recurrent dislocation of shoulder who were treated by Latarjet technique with low profile single 4.0 mm titanium screw and washer for recurrent dislocation of shoulder. The primary objective of our study was to find out the outcome of patients after Latarjet-Bristow procedure. The outcome was assessed using Walch-Duplay Score and Rowe score for shoulder Instability.

Materials and Methods

This study was conducted at department of orthopedics of a teaching institute situated in an urban area. The study was duly approved by institutional ethical committee. All adult patients more than 18 years of age and with history of recurrent shoulder dislocation were included in this study on the basis of predefined inclusion

criteria. Patient having any exclusion criteria were excluded from the study. In all patients the same radiological protocol was used before and after surgery. Anterior-posterior views of the glenohumeral joint were taken in neutral, internal and external rotation of the arm. 3 D CT of shoulder joint and MRI were done in selected patients depending upon the pathology. All patients underwent Latarjet-Bristow procedure. The procedure comprised of osteotomizing the coracoid at its base followed by its mobilizing along with the conjoint tendon and fixing it on the glenoid with the help of 4.0 mm titanium screw. Patients were operated in supine position with the head end elevated to 20 degrees and a bolster

under the ipsilateral Scapula. An incision was taken over the deltopectoral groove extending from the tip of the coracoid process towards the Axilla. The major vessels were identified and retracted medially or laterally depending upon the location of pathology and convenience of operating surgeon. Tip of the coracoid process and the conjoint tendon was identified. The coracoid process was osteotomized, the undersurface was roughened and two drill holes were made. The prepared coracoid graft was placed over glenoid depending upon the site of defect. The definitive graft fixation was achieved using 4.0-mm titanium screws and washers.

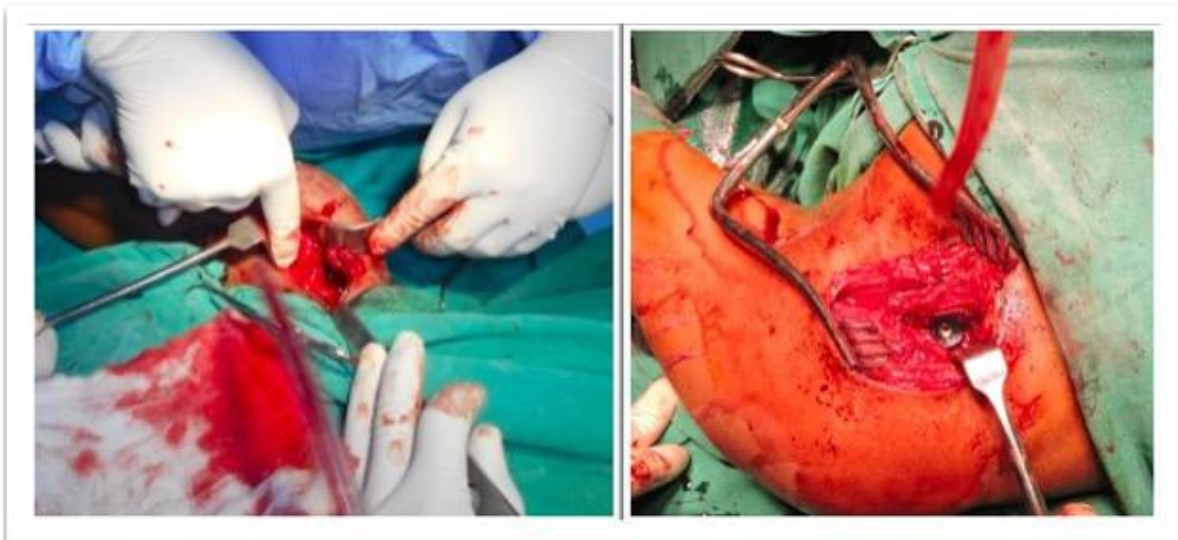


Figure 1: Latarjet procedure. Incision taken over right deltopectoral groove (Left). Coracoid graft placed over glenoid using 4.0 mm titanium screw and washer (Right)

After the procedure closure was done in standard fashion and an arm sling was given at 90 degrees flexion of the elbow joint. The patient was then started with physiotherapy from the third post-operative day in the form of all movements except extreme abduction and external rotation. Post-operative X-ray was done in all operated cases.

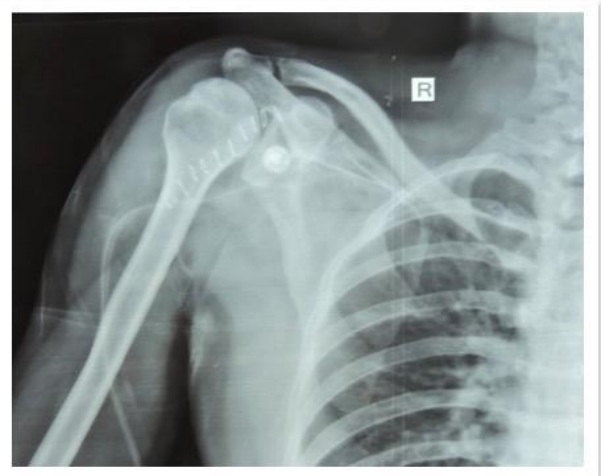


Figure 2: Post-operative X-Ray showing screw in place.

The patients were discharged on the 10th day after stitch removal and were followed up at 4 weeks, 8 weeks and 12 weeks and then 3 monthly for at least 1 year. Post-operative shoulder function was evaluated using Walch-Duplay Score and Rowe scores. The results were studied using appropriate statistical methods. Data analysis was carried out using SPSS16.0 version software. Microsoft word and excel were used for generating charts and graphs

Inclusion Criteria

1. All patients more than 18 years of age having recurrent dislocation of shoulder due to bankers or Hill Sachs lesions.
2. Patients treated by Latarjet-Bristow procedure.
3. Patients consented for being part of the study.
4. Patients who remained in follow up at least for 1 year.

Exclusion Criteria

1. Patients less than 18 years.
2. Those who refused consent.
3. Patient having syndromic ligament laxity like Ehlers-Danlos or Marfan syndrome.
4. Patients who didn't come for follow up at least for 1 year.

Results

Out of the 30 patients diagnosed with recurrent shoulder dislocation and treated with Latarjet technique there were 22 (73.33 %) Males and 8 (26.66 %) females with a M: F ratio of 1: 0. 36.

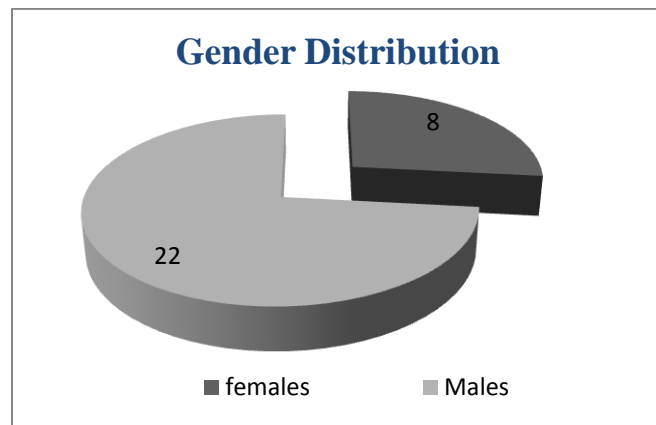


Figure 3: Gender Distribution of the studied cases.

The analysis of the age groups of the patients revealed there were 12 (40 %) patients in age group between 26 –35 years, 10 (33.33%) patients in age group between 18 – 25 years and 6 (20 %) patients in age group between 36 – 40 years. Mean age of the study group was 29.86 ± 7.26.

Table 1: Age distribution of the studied cases

Age groups	No. of Patients	Percentage
18 - 25 years	10	33.33 %
26 - 35 years	12	40 %
36 – 40 years	6	20 %
> 40 years	2	6.66 %
Grand Total	30	100 %
Mean Age ± SD = 29.86 ± 7.26 years		

Mechanism of injury in majority of the patients during 1st episode of dislocation was enquired into and it was found that the most common mechanism during first instance of dislocation was fall (43.33%) followed by motor vehicular accidents (40 %) and sports injury (16.66 %).

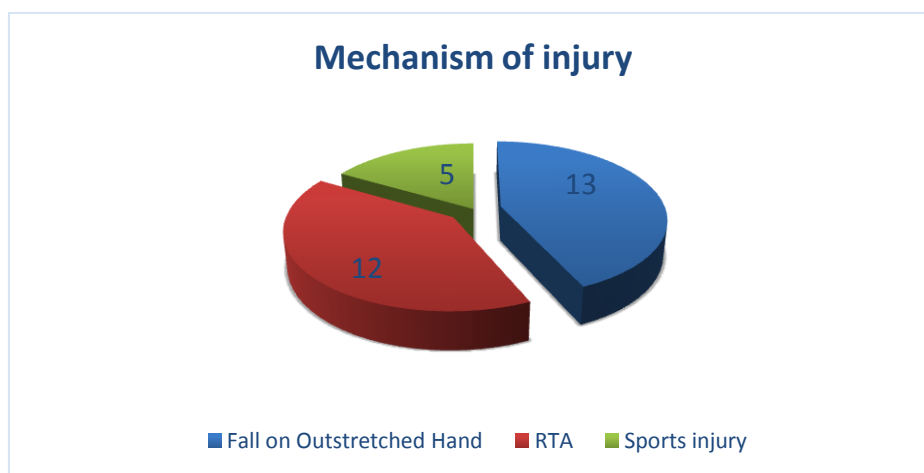


Figure 4: Mechanism of Injury in the studied cases

In 19 (63.33 %) patients shoulder dislocation was seen on right side and in 11 (36.66 %) patients the dislocation was seen on left side.

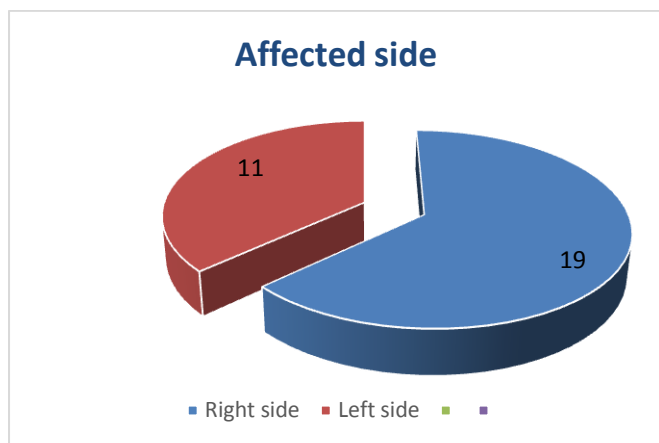


Figure 5: Affected side in the studied cases

All patients underwent surgical procedure by Latarjet technique with low profile 4.0 mm titanium screw. The analysis of the results obtained after this procedure in patients with recurrent shoulder dislocation showed that there was a significant difference in preoperative and

postoperative Walch-Duplay Score. While in preoperative patients it was found to be 51.3 +/- 15.4 after Latarjet procedure the mean Walch-Duplay score was found to be 91.7 +/- 18.2. The difference in mean preoperative and postoperative Walch-Duplay score was found to be statistically significant.

Table 2: Mean Pre and post-operative Walch-Duplay Scores

Mean Preoperative Walch-Duplay score	51.3 +/- 15.4	P< 0.001. Statistically Significant
Mean Postoperative Walch-Duplay score	91.7 +/- 18.2	

Based on the outcome of patients on the basis of Walch-Duplay Scores it was found that 19 patients had excellent results (Walch-Duplay Scores more than 90) while 8 patients had good results (Walch-Duplay Scores score between 76-90). Medium (Walch-Duplay Scores between 51-75) and poor (Walch-Duplay Scores less than 50) results were found in 2 and 1 patient respectively.

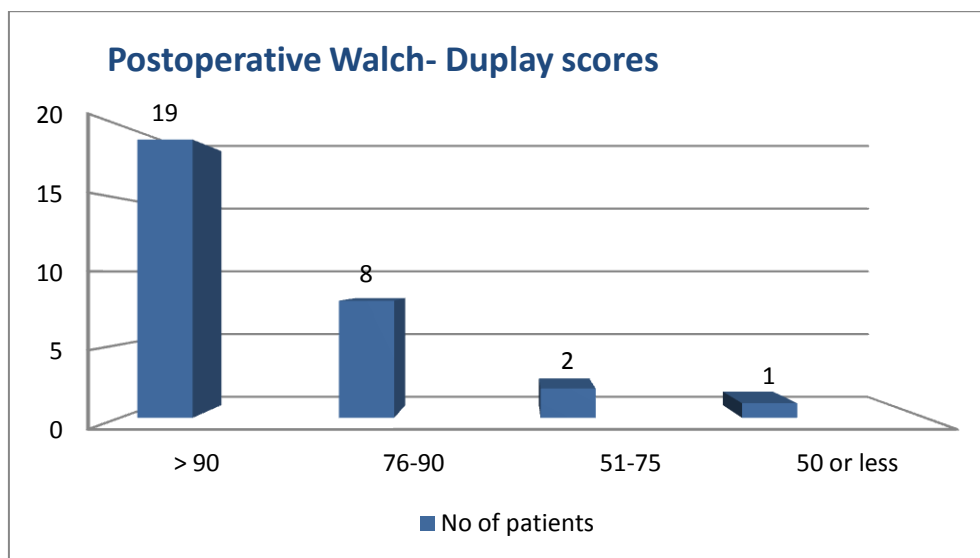


Figure 6: post-operative Walch-Duplay Scores Scores

The analysis of ROWE score which takes into account the factors like recurrence, subluxation or apprehension in certain positions, incidence of dislocation, range of movements like internal rotation, external rotation and elevation and finally limitation of work or sports and pain or discomfort showed that mean Preoperative and postoperative ROWE scores were 48.3 +/- 13.2 and 90.2 +/- 14.8 respectively and there was

statistically significant difference in the preoperative and postoperative ROWE scores.

Table 3: Mean Pre and post-operative Walch-Duplay Scores.

Mean Preoperative Walch-Duplay score	48.3 +/- 13.2	P< 0.001. Statistically Significant
Mean Postoperative Walch-Duplay score	90.2 +/- 14.8	

Based on the outcome of patients on the basis of ROWE scores it was found that 18 patients had

excellent results (ROWE scores 90 or above) while 8 patients had good results (ROWE scores between 75-89). Fair (ROWE scores between 51-

74) and poor (ROWE scores less than 50) results were found in 3 and 1 patients respectively.

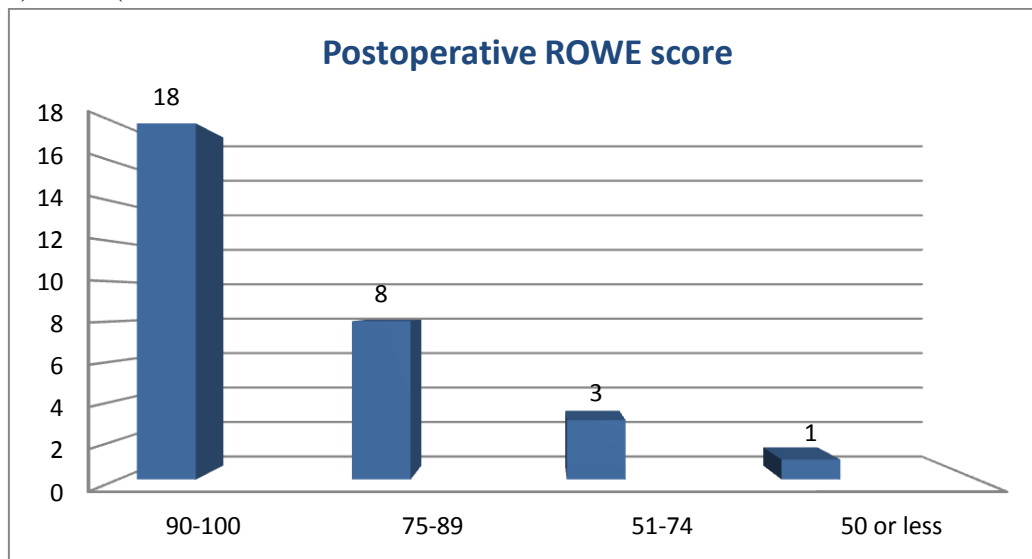


Figure 7: Postoperative ROWE score

Analysis of the complications in the studied cases revealed that out of 30 operated cases there were 4 cases with postoperative complications. These complications included wound infection (6.66 %),

hematoma (3.33 %) and nerve injury (3.33% patients). There were no instances of screw pull outs, dislocations or shoulder instability during follow up of 1 year.

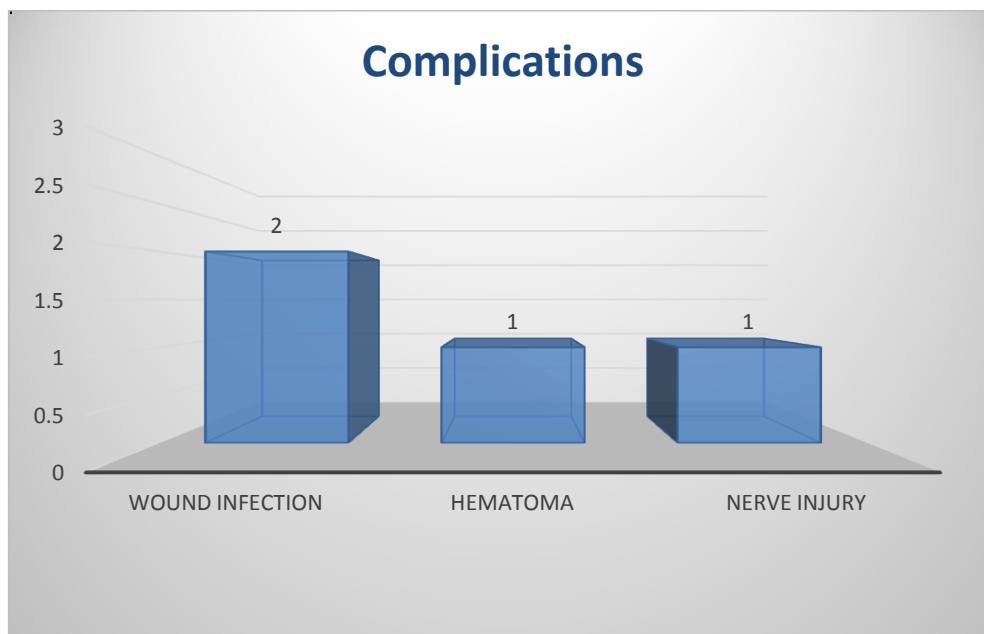


Figure 8: Complications in the studied cases

Discussion

In this study of 30 cases with recurrent shoulder dislocation males were predominantly affected with a M:F ratio being 1: 0.36. Many studies have reported recurrent shoulder dislocation to be more

common in males than in females. This may have to do with the fact that initial episode of shoulder dislocation is more common in males because of their involvement in road traffic accidents, falls and sports activity^[11]. In developed and western

countries where female involvement in sports and motor vehicular accidents is more as compared to developing world this gender difference may not be that wide as seen in our study. The fact that most of shoulder dislocations are seen in relatively younger age makes it more likely that men will be affected more than women because of their involvement in high-energy injuries to the shoulder^[12]. Shah et al in their study of shoulder dislocation found that the incidence rate in men was 40.4 per 100 000 person-years (95% CI 40.4 to 40.4), and in women was 15.5 per 100 000 person-years (95% CI 15.5 to 15.5). The authors further found that Incidence was significantly higher in men than women in almost all age groups, with an overall incidence rate ratio of 2.60 (95% CI 2.52 to 2.69). The only exception was men and women aged 61–70 years, where no significant difference in incidence was observed ($P=0.334$)^[13].

The management of recurrent shoulder dislocation by Latarjet procedure is found to be very effective in various studies. Luciana Andradeda Silva retrospectively analyzed Fifty-one patients (52 shoulders) with anterior recurrent dislocation, surgically treated by Latarjet procedure. The scores of Rowe and UCLA were found to be 90.6 and 31.4, respectively, in the postoperative period. Eleven shoulders (21.2%) had poor results: signs of instability (13.4%), non-union (11.5%) and early loosening of the synthesis material (1.9%). There was a correlation between poor results and convulsive patients ($p = 0.026$). The authors concluded that the Latarjet procedure for correction of anterior recurrent dislocation leads to good and excellent results in 82.7% of cases. Complications are related to errors in technique^[14]. Similar results were found in the studies conducted by Fontanesi G et al and Matton D et al^[15,16].

The functional outcome of the patients treated by Latarjet can be assessed by using various scores like ROWE score and Walch-Duplay Scores. While Walch Duplay score takes into account factors like daily activity, Stability, Pain and

Mobility ROWE score takes into account the factors like recurrence, subluxation or apprehension in certain positions, incidence of dislocation, range of movements like internal rotation, external rotation and elevation and finally limitation of work or sports and pain or discomfort. Various studies have found postoperative outcome after Latarjet technique to be excellent as assessed by Walch-Duplay Score or ROWE score or both. Chaudhary D et al in their retrospective analysis of 24 patients with recurrent anterior shoulder instability treated by Latarjet technique did functional assessment of postoperative patients using Rowe score and Walch Duplay scores. The authors found statistically significant improvement (p value 0.034). The authors concluded that Latarjet technique gives satisfactory outcome in patients who require reoperation due to dramatic bone loss and failed soft tissue reconstruction^[17]. Similar findings were reported by authors like Raiss P et al and Bliven KCH et al^[18,19].

In our study complications were seen in 4 patients (13.33%). The complications included infection wound infection, hematoma and musculocutaneous nerve injury. The nerve injury was found to have been resolved when patient came for follow up after 6 weeks making this injury to be neuropraxia rather than neurotmesis. The other complications of this procedure as reported by various authors include graft malposition, neurovascular injuries, non-union, screw breakage and shoulder arthritis. Shah Anup et al in their study of Forty-seven patients who underwent Latarjet procedure found that the overall complications rate to be 25 %. During this study the authors found that infection, recurrent glenohumeral instability, and neurologic injuries were the most common complications. The authors recommended that Patients should be informed of the risk of complications associated with the Latarjet procedure, although most of the potential complications will resolve^[20].

Conclusion

Recurrent dislocation of the shoulder joint is one of the common problems seen in orthopedics practice. The results of Latarjet- Bristow technique using 4.0-mm titanium screws and washers for graft fixation is an excellent procedure with satisfactory outcome. Though complications such as wound infection, hematoma or neuropraxia may be seen in some patients they are expected to resolve over a period of weeks. Nonetheless patients should be informed about the possible complication associated with this procedure.

Conflict of Interest: None

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