



St. Paul Hospital Millennium Medical College
Graduate Study Program

**Functional Outcome of Recurrent Anterior Shoulder Dislocation
after Latarjet Procedure at AaBET and Dream Hospitals**

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Resident)**

**thesis submitted to the Department of Orthopedics and Trauma
Surgery; Presented in Partial fulfillment of the Requirements for the
Specialty Certificate of Orthopedics and Traumatology Surgery; St.
Paul Hospital Millennium Medical College**

Addis Ababa, Ethiopia

January, 2026

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**Functional Outcome of Recurrent Anterior Shoulder Dislocation after
Latarjet procedure; a multicenter retrospective study at AaBET hospital in St.
Paul's Hospital Millennium Medical College and Dream Hospital Addis
Ababa, Ethiopia from September 2020 – July 2025**

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Abstract

Background: -The recurrent anterior shoulder dislocation is worldwide orthopedic condition that mainly affects the young and active patients after the first traumatic dislocation. It has a considerable morbidity associated with pain, dislocation, instability and dysfunction. In Ethiopia, many patients cannot access early arthroscopic soft tissue repair due to scarcity of specialists and delayed surgery scheduling. So that the Latarjet procedure became a suitable procedure that addresses both bony and soft tissue deficits. Although mechanical stability after Latarjet is well documented internationally there is still a limited data exists in our regional context regarding how patients functionally recover following this procedure.

Objectives: -To evaluate the functional outcome of patients with recurrent anterior shoulder dislocation treated with the Latarjet procedure at AaBET Hospital and Dream Hospital

Methods: The study was conducted at AaBET hospital and Dream hospital from October 1 to December 31 2025 in Addis Ababa Ethiopia. It was a multicenter retrospective study. All the patients underwent the Latarjet procedure to these two hospitals from September 2020 to July 2025 were included. The data was collected using primary and secondary functional scores. After the data collection statistical analysis was done using SPSS. Paired t-tests were comparing pre-operative and post-operative scores. Correlation and regression analysis was assessing relationships between pre-operative variables and outcome. A P-value < 0.05 was considered statistically significant.

Results: Nearly half of participants (48%) achieved excellent Rowe scores, while 47% had good outcomes and 5% fair outcomes. Corresponding WOSI scores demonstrated that the majority of patients with good Rowe outcomes had excellent patient-reported function (75.9%). The mechanism of first dislocation ($p = 0.006$) and postoperative rehabilitation ($p = 0.019$) were significant predictors. The total WOSI score showed a strong negative correlation with Rowe scores ($r = -0.625$, $p < 0.001$). Stability, motion, and function domains of the Rowe score demonstrated high mean values (44.6/50, 16.9/20, and 25.7/30, respectively), and 85% of patients had good to excellent shoulder function postoperatively.

Conclusion: The Latarjet procedure provides reliable restoration of shoulder stability and function in patients with recurrent anterior instability. Clinician-assessed Rowe scores strongly correlate with patient-reported WOSI outcomes, supporting their combined use in evaluating surgical success.

Keywords: Recurrent anterior shoulder dislocation, functional outcome, Latarjet procedure

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Acronyms and Abbreviations

AaBET: Addis Ababa Burn, Emergency and Trauma

AA: Addis Ababa

ASES: American Shoulder and Elbow Surgeons score

ETB: Ethiopian Birr

FBB: Free Bone Block

FDA: Falling down accident

MRN: Medical Record Number

EOPD: Emergency Outpatient Department

OPD: Outpatient department

OR: Operation room

OSIS: Oxford Shoulder Instability Sore

PROMs: Patient Reported Outcome measures

ROM: Range of Motion

SD: Standard Deviation

SPHMMC: Saint Paul Hospital Millennium Medical College

SPSS: Statistical Package for the Social Sciences

USA: United States of America

WOSI: Western Ontario Shoulder Instability index

2D CT scan: Two-Dimensional Computed Tomography

3D CT scan: Three-Dimensional Computed Tomography

1. Introduction

1.1 Background

The glenohumeral joint is a synovial, ball and socket joint, which is formed by the humeral head laterally and the glenoid fossa of the scapula medially. By possessing an extensive range of movements, the glenohumeral joint sacrifices stability for greater mobility, especially when compared with other large synovial joints, such as the hip, elbow and knee joints. The glenoid fossa is an inverted comma shape, which articulates with the humeral head and is comparatively smaller and flatter than the humeral head (1).

The bony contact of the glenoid with the head of humerus is only 30% suggesting that the joint has a shallow osseous confinement. So, the major stability of the joint is because of the various soft tissue structures rather than the bony contact. Stability of the shoulder is due to static as well as dynamic stabilizers such as glenohumeral articulation, glenohumeral ligaments, labrum, rotator cuff, and deltoid muscle (2). The shoulder is the most commonly dislocated joint in the body with a global incidence that ranges from 15.3 to 24.8 per 100 000 people (3). Recurrent shoulder dislocation is when the glenohumeral joint dislocates two or more episodes, typically occurring in the same direction (usually anterior) (4).

Recurrent anterior instability is caused by injuries resulting in the detachment of the labrum from its attachment to glenoid. The anteroinferior detachment of the glenoid labrum described as a Bankart lesion, was found in up to 87% to 100% shoulder dislocations occurring for the first time(2). There are a lot of risk factors related the recurrence of shoulder dislocation in which a lot studies mentioned the common causes these include gender, age at first dislocation, hyperlaxity, greater tuberosity fractures, and participation in contact sports among other factors have been suggested to contribute to the recurrence rate of shoulder dislocations and joint instability (5). The high risk of recurrence among young patients is a major concern post primary traumatic anterior shoulder dislocation. The factors increasing the risk of recurrence are glenoid bone loss, engaging Hill-Sachs lesion, hyperlaxity, glenoid concavity deficiency, and a population below 20 years at the time of first dislocation (2).

In many cases conservative treatment or soft tissue repair like Bankart repair may fail to restore long term stability, especially when glenoid bone loss or large Hill-Sachs lesions are present (6).

In such cases the Latarjet procedure has become a reliable surgical solution to prevent further dislocations and provides excellent long-term outcomes in the treatment of recurrent anterior glenohumeral instability (7).

The French surgeon Dr. Latarjet described in 1954, the Latarjet procedure which is a coracoid process transfer in which the inferior surface of the coracoid is passed through the subscapularis tendon and secured to the anteroinferior glenoid to treat anterior glenohumeral instability (7). In which, three processes work together to augment anterior shoulder instability, resulting in a “triple-blocking” effect. First, the bony coracoid block extends the glenoid rim, serving as a static restraint that improves the “safe arc” available for translation before dislocation (bony effect). Second, the conjoined tendon acts as a sling over the humerus, resisting anterior translation when the arm is abducted and externally rotated (belt or sling effect) and lowering the lower part of the subscapularis, creating a tenodesis effect that reinforces the weakened capsule anteroinferiorly. Third, the labrum and anterior capsule are reattached to the glenoid rim and are reinforced with the coracoacromial ligament (bumper effect) (8). The current studies show that the Latarjet procedure provides excellent long-term clinical results(7) .

1.2 Statement of the Problem

The glenohumeral joint has been reported as the most commonly dislocated synovial joint of the human body (9). The incidence of glenohumeral dislocations has been reported as high as 23.9 per 100,000 person-years and a lifetime prevalence between 2-8% in the general population in the United States (10). For the recurrence there is study conducted in South Africa described that the recurrence of the glenohumeral instability is the primary cause of disability among the teenage athletic population with a reported incidence of 24 cases/100,000 population per year (11). Therefore, the recurrent anterior shoulder dislocation is a disabling orthopedic condition, particularly affecting young, active individuals following a traumatic initial dislocation (12).

1.3 Rationale of the Study

Despite the increasing global acceptance of the Latarjet procedure, there is limited data from the sub-Saharan African countries, including Ethiopia, postoperative functional outcomes, return to activity and short term and long-term patient’s complications. Most of the existing studies in high income countries focus on athletic population, often in specialized sports medicine settings, which may not be representative of the patient demographics or healthcare resources available in

Ethiopia. In the Ethiopian context, the problem of recurrent anterior shoulder dislocation is likely underreported, and access to timely surgical intervention is limited. There is no local research evaluating long-term functional outcome and quality of life after surgical stabilizations. Moreover, given that patient in Ethiopia may present late, with more advanced bone loss and limited rehabilitation resources, outcomes may differ significantly from those reported in international literature. Therefore, assessing the magnitude and functional outcome of recurrent anterior shoulder dislocation following the Latarjet procedure in our setting is both timely and necessary to inform clinical practice and contribute to the body of evidence in orthopedic shoulder surgeries.

Currently, no previous multicenter studies with long-term follow-up have been conducted in Ethiopia or neighboring East African countries. This absence of region-specific data creates a critical gap in understanding the effectiveness and challenges of the Latarjet procedure in our setting, where both patient profiles and healthcare systems differ substantially from those in the international literature.

2. Literature Review

A prospective cohort study conducted Scotland in 2006 evaluated 252 patients aged 15–35 years with primary anterior shoulder dislocation treated nonoperatively found that recurrent instability is very common, developing in 55.7% within two years and 66.8% by five years, with the majority of recurrences occurring in the first two years. Younger males were at the highest risk, while older patients and females had significantly lower recurrence rates. Functional assessment revealed that even patients without recurrence had small but measurable shoulder function deficits at two years, and those who underwent stabilization for recurrent instability had greater restrictions, especially in external rotation (13).

A systematic review analyzed Level I and II prognostic studies on nonsurgical management of traumatic primary anterior shoulder dislocation to determine recurrence rates and predictive factors. Across 15 studies including 22,845 patients, the pooled recurrence rate was 21% (47% in Level I studies), with an average time to recurrence of 10.8 months. Younger age was the strongest predictor, with patients under 20 years having nearly 13 times higher risk, while male sex increased recurrence odds by 2.7 (14).

Another systematic review study published in 2024 found that male sex, participation in sport,

hypermobility in males, and glenoid index demonstrated moderate to large risk associated with first time shoulder instability. Male sex, age < 30 years, and prior history of glenohumeral instability with concomitant injury demonstrated moderate to large risk associated with recurrent shoulder instability (10).

A systematic review conducted in USA and examined twenty-five articles written between 2000 and 2024 assessing whether arthroscopic Bankart repair is a viable option for recurrent shoulder Instability suggested that the study is consistent with their previous study which they found the Latarjet procedure had less recurrence rate than the Bankart repair and also in this study they found that the Latarjet procedure is the definitive treatment after a primary Bankart repair necessitating surgical revision, especially in cases of supracritical (>20%) bone loss (15).

A prospective study conducted in France, Lafosse et al and his friends mentioned that Bankart repair remains the most common procedure performed for instability but this technique has demonstrated excellent results when used for isolated soft-tissue Bankart lesion. When other more extensive injuries exist, such as irreparable soft-tissue damage, complex labral disruptions, or humeral avulsion of glenohumeral ligament (HAGL) lesions, this technique may not be sufficient to stabilize the shoulder and Latarjet procedure is preferred (16).

A systematic review and meta-analysis done in Australia and eight comparative studies were identified with 795 shoulders found that the Latarjet procedure is superior in the setting of bone loss than Bankart repair. The Latarjet procedure confers less recurrence and revision surgery compared with the Bankart repair, with no significant difference in the rate of complications requiring reoperation (17).

Another study comparing the Latarjet procedure and Bankart repair which is retrospective study with prospective data collection done in Spain showed that Arthroscopic Latarjet was associated with a significantly lower recurrence rate and better postoperative WOSI score and sports activity level at long-term follow-up compared with arthroscopic Bankart, without any greater risk of complications (18).

A retrospective study of 68 the Latarjet procedure with mean of 20 years postoperatively conducted in France found that a long-term follow-Up of a the Latarjet procedure provides excellent long-

term outcomes in the treatment of recurrent anterior glenohumeral instability. Twenty years after the Latarjet procedure, arthritis may develop or progress in 23.5% of cases, but the majority of arthritis was mild (7).

A systematic review and meta-analysis of comparative studies of both the Latarjet procedure and Free Bone Block (FBB) procedures included three retrospective and four prospective cohort studies, and three randomized controlled trials conducted in 2025, with a total number of 665 patients, mean age 29, mean follow-up 37 months using patient reported outcome scores the Western Ontario shoulder instability index (WOSI), the Rowe score, the subjective shoulder value (SSV), and the visual analogue scale (VAS) for pain found no significant differences between the Latarjet procedure and FBB techniques in terms of recurrence rate, PROMs, range of motion, reoperation rate, and the rate of scapular dyskinesis but the FBB has graft donor comorbidity (19).

Another retrospective study conducted in USA, in 2018 a total patient of 109 treated with an open Latarjet procedure, the mean surgery age was 25.8 years and the follow-up mean was 52 months using the primary outcome scores of the Western Ontario Shoulder Instability Index (WOSI), the American Shoulder and Elbow Surgeons (ASES) questionnaire and a visual analog scale (VAS) for pain found that the outcome of the Latarjet procedure in high-risk contact or collision athletes is variable. Patients who have fewer recurrence prior stabilization surgical procedures are more likely to successfully return to their original sport (20).

Shah et al and his colleagues conducted a study of 47 patients underwent the Latarjet procedure for anterior glenohumeral instability between January 2005 and January 2010 in USA they mentioned that the Latarjet procedure is useful for treatment of anterior instability of the glenohumeral joint, including revision anterior stabilization in cases of recurrent instability with glenoid deficiency as well as primary anterior stabilization in shoulders with glenoid bone loss (21).

A prospective study conducted in 2019 and published in European Society of Sports Traumatology, Knee Surgery and Arthroscopy journal, which was emphasized to look the immediate postoperative rehabilitation of patient with anterior shoulder instability after the Latarjet procedure with total of 265 shoulders, found that immediate self-rehabilitation to be independently associated with better recovery and did not cause any adverse events (22).

A prospective observational study was conducted in Greece, May to October 2020 found that the importance of the postoperative physiotherapy. This demonstrated that immediate self-rehabilitation after a mini-open Latarjet procedure was safe and effective in motivated military patients, without complications or mobility restrictions. These findings are particularly relevant in situations where access to physiotherapy is limited, such as during pandemics, deployments, or resource-constrained settings (23).

A prospective study published in 2024, with total of 84 patients, showed that the Latarjet procedure performed for anterior instability including capsular repair results in full ROM recovery in external rotation and internal rotation at 6 months. In this study they also found that the sling immobilization postoperatively has no benefit, and they encourage not to use postoperatively to get full range of motion (24).

A cohort study of Nineteen patients (21 unstable shoulders) with a seizure disorder (epilepsy group) were matched with 21 patients without a history of seizure (control group) conducted in USA in 2022 found that Arthroscopic Latarjet stabilization can lead to improved functional and subjective outcomes and should be considered in patients with epilepsy with recurrent anterior glenohumeral instability. These results were achieved regardless of the presence of bone defect and the postoperative control of seizures and are similar to those in patients without epilepsy (*American journal of sports medicine, Lika Dzidzishvili 2022*).

Another study done in USA, which was a retrospective review of patients undergoing Latarjet from 2013 to 2017 for anterior shoulder instability with minimum 2 years of clinical follow-up, found that Latarjet is a successful operation for recurrent anterior shoulder instability in patients without seizure disorder. While it can still be successful in patients with seizure disorder, adequate control of seizures postoperatively is paramount to prevent recurrent instability (25).

Wang L et al and his colleagues has conducted a meta-analysis in 2023, they summarized their findings that the meta-analysis provides robust evidence supporting the Latarjet procedure's exceptional functional outcomes for athletes with glenoid bone defects $\geq 20\%$. The majority of patients exhibited a successful return to sports preoperatively, and there was a low recurrence rate typically $< 5\%$, suggesting that the Latarjet procedure is a safe and effective therapeutic option in clinical practice (26).

Case series study of sixteen patients with anterior shoulder instability underwent the Bristow-Latarjet conducted in Iraq published in 2025 using WOSI and Rowe Score showed that Bristow-Latarjet surgery provided good to excellent stability of the shoulder joint with a minimal rate of re-dislocation or other complications. There was good improvement in both the Rowe score and Western Ontario Shoulder Instability Index (27).

Prospective study conducted in Egypt of 41 middle-aged male patients presenting with recurrent anterior shoulder instability and isolated glenoid bone loss in a Sample of Egyptian Population Early clinical outcome of the Latarjet Procedure in athletic patients have found that the open Latarjet procedure offers reliable early outcomes in treating recurrent anterior shoulder instability with glenoid bone loss, showing good stability, functional recovery, and low complication rates (published on the Egyptian orthopedic journal, Massoud and Ismail 2025).

A several studies conducted in South Africa for the Latarjet procedure showed that the paramount of the procedure for recurrent anterior shoulder instability and some of them are mentioned below a retrospective morphometric study done in South Africa in 2021 focused exclusively on female patients, reporting lower functional scores and higher complication rates, findings that may be partially explained by smaller coracoid dimensions identified by measurements performed on 2D and 3D CT scan (28)

Another study from South Africa which is case study series conducted in 2018 found that female patients had a lower postoperative return to sport and shoulder scores after the modified Latarjet procedure compared with literature reports. Whereas female gender should not be a contraindication to the Latarjet (29).

A single-center retrospective study conducted in South Africa between 2017 to 2020 with total number of patients 40 responded and there were 9 females and 31 males, with a median age of 32 years using SF-36, WOSI and Rowe Scores found that The Latarjet-Bristow procedure improves the quality of life in a general population similarly to an athletic population. The number of episodes of dislocation before surgery and the delayed surgical intervention did not increase the recurrent anterior shoulder instability rates postoperatively (11).

In Ethiopia, so far there is one retrospective study of the Latarjet procedure in low setup settings conducted in 2022. Total of 45 patients included in the study, 25 patients were presented with recurrent anterior shoulder instability, whereas the remaining 20 patients were presented with chronic locked anterior shoulder dislocation. The study emphasizes functional outcome in both chronic shoulder dislocation and recurrent anterior shoulder dislocation after Latarjet procedure. using the Rowe and UCLA scores of patients with recurrent shoulder instability. They found that the Latarjet procedure has better outcomes and is safe for patients with recurrent shoulder instability compared to the fixed unreduced chronic shoulder dislocation accounts for 44.4% of patients in this study and has a lower functional outcome score after the Latarjet procedure. The complication rate in this study was 20% of chronic dislocation and 6.7% for the recurrent instability (30).

Domos et al and his colleagues by assessing the contraindications and complications of the Latarjet procedure showed the actual cause of recurrent anterior shoulder instability is often caused by glenoid and/or humeral bony defects additional to the soft tissue injuries. Increased surgical failure of the soft tissue repair alone is usually associated with significant bony defects or inadequate soft tissue availability. For this reason, patients with bony defects and recurrent anterior shoulder instability were managed with different glenoid restoring procedures and they concluded that the Latarjet procedure is a safe and reliable technique for managing anterior instability, especially with associated glenoid bone defects. (31).

2.1 Conceptual frame work

This conceptual framework is built on the available literature (11,14,22,23,24,26,28,29)

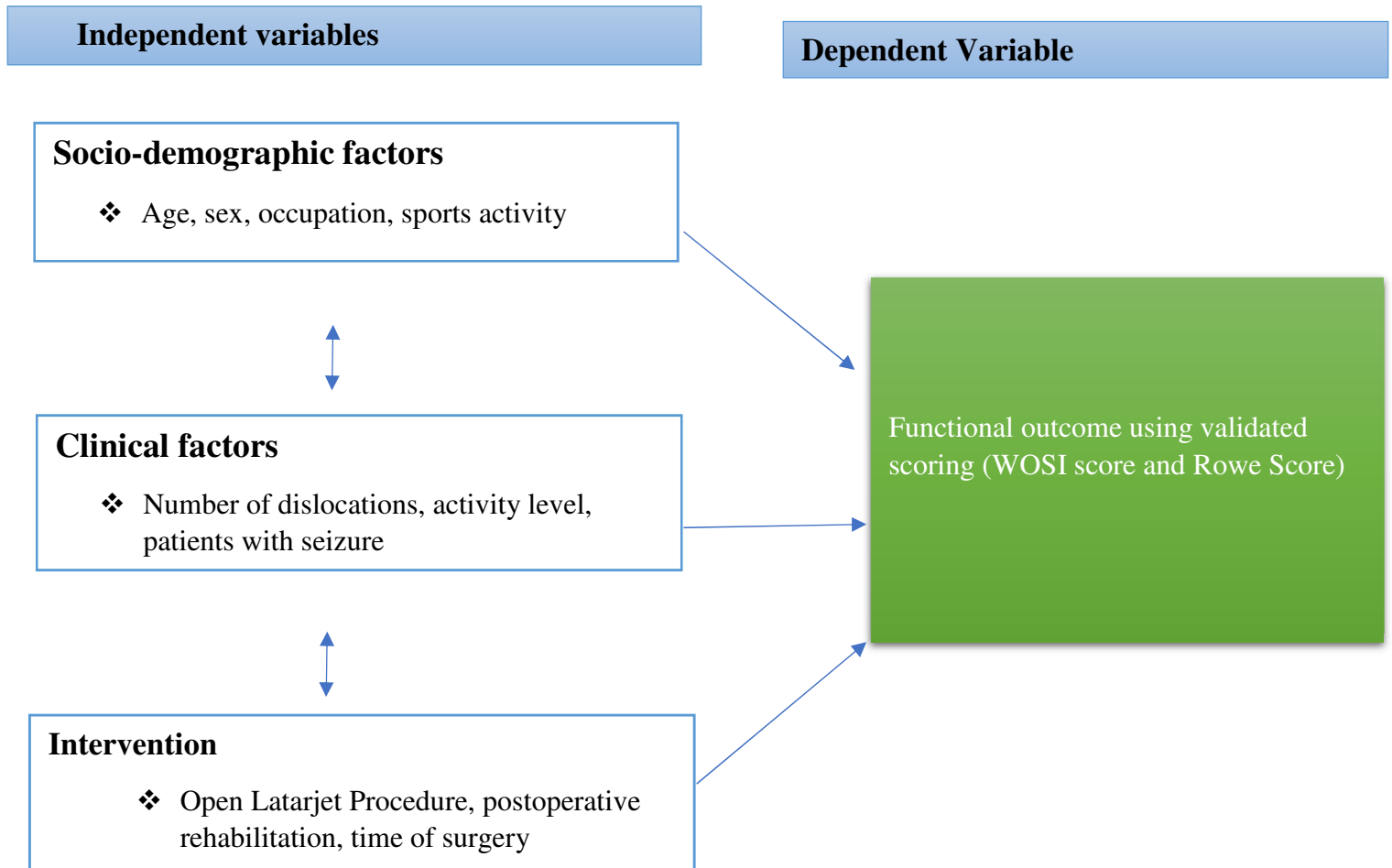


Fig.1 Conceptual framework: - *Functional Outcome and Associated Factors of recurrent anterior shoulder dislocation treated with the Latarjet Procedure at AaBET hospital and Dream hospital in Addis Ababa, 2020-2025*

3. Objectives

3.1 Main Objectives

To evaluate the functional outcome of recurrent anterior shoulder dislocation after open Latarjet procedure in AaBET and Dream Hospitals in the last 5 years AA, Ethiopia.

3.2 Specific Objectives

- 1) Patient reported functional outcome
- 2) Physician reported functional outcome

4. Methodology

4.1. Study setting

The study was conducted in two hospitals, AaBET Hospital (Orthopedics and Traumatology department of Addis Ababa Burn, Emergency & Trauma Hospital). Which is an affiliate of St. Paul's Hospital Millennium Medical College (SPHMMC) and one of the largest tertiary hospitals in Ethiopia. AaBET hospital is the first trauma hospital established in Ethiopia in 2015 G.C. It has been fully and effectively functioning since its establishment and providing a 24/7 service for patients from all over the country. It has is an inclusive of four major departments; Emergency Medicine and Critical Care, Plastic Reconstructive and Hand Surgery, Orthopedics & Traumatology, and Neurosurgery. The Orthopedic department of the hospital is involved in giving service at EOPD, Orthopedic Ward, and Orthopedic outpatient services. The ward service is given using 49 beds for adults and 14 beds for pediatrics. The department uses 2 OR tables for scheduled surgeries having manpower of 19 Consultants (ten general orthopedic surgeons, two sport surgeons, four trauma and arthroplasty surgeons, two pediatric orthopedic surgeons, one ankle and foot surgeon). Currently we have a total of 47 orthopedic surgery residents of a different year of study. It was also conducted from Dream Orthopedics, Trauma and Spine Specialty Center, which is private hospital with a large sports and arthroscopy clinic in Addis Ababa, Ethiopia.

4.2 Study Period

The study was conducted from October 1 to December 31, 2025.

4.2 Study Design

A multicenter retrospective study with a prospective recall of patients

4.3 Source population

The source population was all the patients who presented with shoulder trauma in AaBET hospital and Dream hospital in AA, Ethiopia.

4.4 Study population

The study population included all patients who were diagnosed with recurrent anterior shoulder dislocation and underwent the Latarjet procedure

4.5. Eligibility criteria

4.5.1 Inclusion criteria

All patients who were diagnosed with recurrent anterior shoulder dislocation and underwent Latarjet procedure at AaBET hospital and Dream hospital from September 2020 to July 2025 was studied and who have at least three months of postoperative follow-Up and age greater than or equal to 18 years.

4.5.2 Exclusion criteria:

- Multi-directional dislocation
- Fracture dislocation
- Ipsilateral upper limb fracture
- Bilateral shoulder dislocation
- Patients who are lost their follow-Up
- Patients who passed away
- Patients who lost their charts

4.6 Sample Size

The estimated sample size for the study was 50 patients based on expected number of eligible cases during the study period. However, during the data collection, a total of 62 patient fulfilled the inclusion criteria and underwent the open Latarjet procedure in AaBET hospital and Dream hospital between September 2020 and July 2025. All the 62 eligible patients were included the final analysis.

4.7 Study Variables

4.7.1 Dependent variables

- Functional outcome scores
 - Functional outcome measures using validated scores (Western Ontario Shoulder Instability Index WOSI and Rowe score)

4.7.2 Independent variables

- Age
- Sex
- Dominant vs nondominant side
- Number of dislocations
- Activity level (daily laborer, athlete, sedentary)
- Sports type (contact vs non-contact)
- Timing of surgery
- Patients with seizure

4.8 Instruments

A checklist and questionnaires were created by reviewing relevant works of literature. it was designed on English and translated to Amharic language.

4.9 Sample Size Determination

For this study Sample size was calculated using single population proportion formula as follows;

Sample size (n) = $\frac{Z^2 \times p(1-p)}{d^2}$

$$d^2$$

Where,

N= desired sample size = 50

Z = the standard Z-score for the desired confidence level (95%) = 1.96

p = estimated proportion of functional outcomes = 0.83 (based on the Egyptian study (Massoud & Ismail, et al 2025)).

d = the margin of error (5%)

Since the estimated total number of patients who underwent the Latarjet procedure for recurrent anterior shoulder dislocation in the both hospitals between September 2020 and 2025 July is 50 (≤ 100), the sample size needed to be adjusted using the finite population correction

step-1. Initial simple size no correction =

$$\eta_0 = \frac{Z^2 \times p(1-p)}{d^2} = \frac{1.96^2 \times 0.83(1-0.83)}{0.05^2}$$

$$\eta_0 = 216.82$$

step-2. Finite population correction

$$\eta_f = \frac{\eta_0}{1 + \frac{\eta_0 - 1}{N}} = \frac{216.82}{1 + \frac{216.82 - 1}{50}} = 40.808835$$

$$\eta_f = 41$$

Step-3. Adjust for 10% non-responders

$$\eta_{final} = \frac{\eta_f}{1-r} \quad \eta_{final} = \frac{40.808835}{0.9} = 45$$

The total participants expected to be studied was 45

4.9 Sampling Method

Census sampling was employed in this study and all the eligible study participants were included.

4.10 Open Latarjet procedure Surgical Technique

All the patients included in this study have undergone open Latarjet procedure performed by two experienced sports surgeons in AaBET hospital and Dream hospital using a standardized technique and used identical surgical protocol.

Patient positioning and surgical approach

The procedure was carried out under general anesthesia with patient positioned in a beach-chair position and the head turned to the contralateral side. Standard surface landmarks were identified, the coracoid process. Standard deltopectoral approach was used.

Exposure and coracoid preparation

After the skin incision and the subcutaneous tissue dissection, the deltopectoral interval was developed. The deltoid muscle was retracted laterally and the pectoralis major medially, exposing the coracoid process along with the conjoined tendons and the coracoacromial ligament. The coracoacromial ligament was identified and detached from its insertion on the coracoid process. The pectoralis minor tendon was released from the medial aspect of the coracoid and retracted medially. A coracoid osteotomy was performed approximately 2 - 2.5cm from the tip of the coracoid process using an oscillating saw, with careful placement of the retractors to protect neurovascular bundle. The inferior surface of the coracoid graft was decorticated to expose the cancellous bone. Two drill holes were made centrally in the graft, approximately 1cm apart in preparation for the graft.

Subscapularis split and glenoid preparation

The subscapularis muscle was identified and split horizontally at the muscle belly of the junction of superior two-thirds and inferior one-third. The joint capsule was exposed and opened using a vertical capsulectomy. The anteroinferior glenoid was then prepared by decorticating the bone surface to create a bleeding cancellous bed for the graft fixation.

Graft transfer and fixation

The coracoid graft was transferred through the subscapularis split and positioned at the anteroinferior glenoid rim. The graft was placed flesh with the prepared glenoid surface and slightly 1-2mm away from the medial aspect of the glenoid to avoid overhanging. Fixation was achieved using two partially threaded cancellous screws 4.5 mm with screw length ranging from 34mm to 36mm, depending on patient anatomy and bone quality. Care was taken during screw tightening to avoid graft fracture, particularly in the osteopenic bone.

Capsular repair and closure

The joint capsule was repaired by suturing it to the coracoacromial ligament stump using non-absorbable or delayed absorbable sutures, thereby reinforcing the anterior stabilizing effect, creating dynamic effect. The wound was closed in layers in the standard fashion.

Postoperative management

The operated shoulder was immobilized in a sling. External rotation was restricted around six weeks, after which structured physiotherapy program was initiated, focusing on gradual restoration of range of motion followed by strengthening exercises

4.11 Data Collection and Procedures

Sports and Arthroscopy OPD Logbooks and waiting lists, as well as OR logbooks were used to identify MRN of recurrent anterior shoulder dislocation patients presented to AaBET hospital and Dream hospital over the last five years and the patient's chart was retrieved from the record and registration office. Data were collected from the chart record of all patients with recurrent anterior shoulder dislocation who underwent Latarjet procedure at AaBET hospital and Dream hospital during the study period.

Data were collected by four orthopedic junior residents after getting training for 3 days. Data collection was October 01 to December 31, 2025. Using data collection techniques including checklist, Goniometer for shoulder range of motion measurement and it was translated into Amharic language.

4.12 Data Quality Control and Management

The data quality control measures were undertaken by pretesting the data collection tools and checking the completeness and consistencies of the data by the principal investigator. Data quality was controlled by training the data collectors on the contents of the checklist and by supervision of the principal investigator during the data collection process.

4.13 Data Analysis Plan and Procedures

The data were coded and entered into SPSS version 26.0 for analysis. Descriptive statistics including frequencies, percentages, means and standard deviation were used to summarize the clinical characteristics and baseline patients.

The WOSI and Rowe scores were analyzed as continuous variable to assess the postoperative functional outcome. The bivariate analysis was initially used to assess the relationship between the independent variables and functional outcome scores. Pearson correlation was used to assess the relationship between the continuous variables. While the independent t-test was applied to compare mean functional outcome scores between categorical variables with two groups.

Bivariate analysis were used to identify independent predictors of functional outcome after the Latarjet procedure. Finally, the result was presented as regression coefficient (β) with 95% confidence intervals and statistical significance was set a $P < 0.05$

4.14 Operational definitions

Latarjet procedure: surgical technique involving transfer of glenoid process to the anterior glenoid to restore stability through a bony block and sling effect from the conjoined tendons (32).

Functional outcome: the patient's recovery in terms of shoulder strength, range of motion, pain, stability, return to activity, and overall satisfaction, and often is measured using by a scoring system the Rowe and WOSI scores.

Multi-directional dislocation: is a condition characterized by generalized instability of the shoulder in at least 2 planes of motion (anterior, posterior, or inferior) due to capsular redundancy (orthobullets)

Bilateral dislocation: The two humeral heads dislocate from the scapular glenoid fossa in the same direction or in different directions (33)

Fracture dislocation: the humeral head dislocates from the glenoid fossa and associated with either humeral head fracture or glenoid fossa fracture or both (Rockwood and Green's Fractures in Adults. 10th Edition)

4.15 Ethical Consideration

Ethical clearance was obtained from SPHMMC Research Review board and Dream Hospital Board before starting the study. Informed verbal and written consent were obtained from the participants. The information found from this study was kept secret and only used for the study purpose. After completion of data collection, medical records were returned to their original place properly.

4.16 Dissemination of Results

After the final defense of thesis, the study results will be submitted to the Department of Orthopedics and Traumatology for partial fulfillment of a specialty certificate in Orthopedics and Traumatology. It will also be submitted to the AaBET hospital administration, SPHMMC administration, and every possible effort will be made for publication in reputable journals.

5. Result

5.1 Sociodemographic characteristics of the study participants

The majority of the study participants were male, accounting for 58 (93.5%) of the cases, while females comprised only 4 (6.5%). Most participants were young adults, with 46 (74.2%) aged between 18 and 30 years, and the remaining 16 (25.8%) aged between 30 and 42 years. Regarding place of residence, 39 (62.9%) of the participants were from Addis Ababa, whereas 23 (37.1%) resided outside Addis Ababa. In terms of occupation, office workers and students were the most common groups, each representing 17 (27.4%) of the participants. This was followed by drivers and daily laborers, each accounting for 9 (14.5%). Smaller proportions of participants were housewives and security personnel, each with 2 (3.2%), while 6 (9.7%) were categorized under other occupations.

Table 1. the sociodemographic characteristics of the study participants among patient managed with the Latarjet procedure of having Recurrent Anterior Shoulder Dislocation

Variable	Frequency	Percent
Sex		
Male	58	93.5
Female	4	6.5
Age in years		
18-30	46	74.2
30-42	16	25.8
Address of the participants		
Addis Ababa	39	62.9
Out of Addis Ababa	23	37.1
Occupation		
Housewife	2	3.2
Security	2	3.2
Office	17	27.4
Driving	9	14.5
Student	17	27.4
daily laborer	9	14.5
Other	6	9.7

5.2 Clinical characteristics of the study participants

All study participants were right-hand dominant, accounting for 62 (100%). The most common mechanism of the first dislocation was fall down accident (FDA), reported in 46 (74.2%) patients,

followed by injury during exercise in 6 (9.7%), road traffic accidents in 5 (8.1%), fighting-related injuries in 4 (6.5%), and electric shock injury in 1 (1.6%) patient. The right shoulder was more frequently affected, involving 37 (59.7%) patients, while the left shoulder was affected in 25 (40.3%). Regarding the number of dislocations prior to surgery, more than half of the participants, 35 (56.5%), experienced between 6 and 10 dislocations, whereas 15 (24.2%) had five or fewer dislocations and 12 (19.4%) had more than 10 episodes. None of the participants had a history of previous shoulder surgery. A history of seizure disorder was reported in 4 (6.5%) patients, while 58 (93.5%) had no such history. Among those with seizures, the duration of seizure control before surgery was 6 months in 2 (50%) patients, and 5 months and 12 months in 1 (25%) patient each. The duration of shoulder instability was between 3 and 5 years in half of the participants, 31 (50%), while 22 (35.5%) had instability for three years or less and 9 (14.5%) for more than five years. Concerning the timing of surgery, 33 (53.2%) patients underwent the procedure between 1 and 3 years prior to the study, 17 (27.4%) more than 3 years earlier, and 12 (19.4%) within the last year.

Table 2. clinical characteristics of among patient having Recurrent Anterior Shoulder Dislocation managed by the Latarjet procedure

Variable	Frequency	Percent
Domain of hand		
Right-handed	62	100
Mechanism of the Injury of the first dislocation		
FDA	46	74.2
RTA	5	8.1
Injury while exercising	6	9.7
Fighting injury	4	6.5
Electric shock injury	1	1.6
Affected shoulder		
Left	25	40.3
Right	37	59.7
Number of dislocations before surgery		
≤5	15	24.2
6 -10	35	56.5
>10	12	19.4
Previous shoulder surgery		
No	62	100
History of seizure surgery		
Yes	4	6.5
No	58	93.5
Duration of control of seizure before surgery in month		

5	1	25
6	2	50
12	1	25
Duration of shoulder instability in years		
≤3	22	35.5
3-5	31	50
>5	9	14.5
Duration of the surgery done in years		
<1	12	19.4
1-3	33	53.2
>3	17	27.4

5.3 Descriptive statistics of continuous clinical variables

The mean age of the study participants was 28.3 ± 5.4 years, ranging from 18 to 42 years indicating that the study predominantly consists of young adults. A population known to be a higher risk factor of recurrent anterior dislocation. The mean number of shoulder dislocation prior to surgery was $10.8 \pm$ with a wide range of (2 to 60 dislocations) reflecting substantial variability in severity and chronicity among patients before undergoing the surgery.

The mean duration of shoulder instability before the surgical intervention was 3.6 ± 2.5 years, ranging from 0.5 to 14 year, suggesting that a considerable proportion of patients experienced prolonged instability before the definitive surgical stabilization.

Regarding the follow-Up the mean time of follow-up after the surgical stabilization was 2.33 ± 1.7 years with a range of 0.25 to 5 years, allowing for adequate assessment of midterm postoperative functional outcomes using both physician reported and patient reported outcome measures.

Table 3. Descriptive statistics of continuous clinical variables among patients underwent the Latarjet procedure

Variables	Mean	SD	Minimum	Maximum
Age (years)	28.3	± 5.4	18	42
Number of dislocations before the surgery	10.6	± 13.2	2	65
Duration of shoulder instability in years	3.6	± 2.5	0.5	14

Postoperative follow-up durations in years	2.3	± 1.7	0.25	5
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5.4 Post surgery related characteristics the shoulder dislocation

Most participants received postoperative rehabilitation at a physiotherapy center, with 51 (82.3%) reporting attendance, while 11 (17.7%) did not receive physiotherapy. Among those who underwent rehabilitation, the majority, 32 (62.7%), received physiotherapy for less than four weeks, whereas 19 (37.3%) continued physiotherapy for four weeks or longer. Regarding pre-injury activity at the time of the first dislocation, half of the participants, 31 (50.0%), reported being engaged in physical activity and returned fully to their pre-injury activities including playing sports after the Latarjet procedure while the remaining 31 (50.0%) participants modified their pre-injury activities, some of them stopped playing football while they preferred playing pool, running and doing some selected gym activities.

Table 4. Post-surgery related characteristics the shoulder dislocation

Variable	frequency	Percent
Received postoperative rehabilitation at physiotherapy center		
Yes	51	82.3
No	11	17.7
Duration of physiotherapy received in weeks		
<4	32	62.7
≥ 4	19	37.3
Returned to pre-injury activity of the first dislocation		
Yes	31	50.0
No	31	50.0

5.5 Pearson correlation between ROWE score physician record functional outcome

Only one variable showed a statistically significant correlation with the ROWE score. The total WOSI score demonstrated a strong negative correlation with the ROWE score ($r = -0.625$, $p < 0.001$), which was significant at the 0.01 level.

Table 5. Pearson correlation between ROWE score physician record functional outcome and patient characteristics

Correlations		Rowe Score
Age	Pearson Correlation	.082
	Sig. (2-tailed)	.528
	N	62
Duration of shoulder instability (in years)	Pearson Correlation	.233
	Sig. (2-tailed)	.069
	N	62
Duration of surgery done	Pearson Correlation	.171
	Sig. (2-tailed)	.183
	N	62
Number of dislocations before surgery	Pearson Correlation	.163
	Sig. (2-tailed)	.206
	N	62
Total WOSI	Pearson Correlation	-.625**
	Sig. (2-tailed)	.000
	N	62
**. Correlation is significant at the 0.01 level (2-tailed).		
*. Correlation is significant at the 0.05 level (2-tailed).		

5.6 Western Ontario Shoulder Instability Index values

Within the physical symptom domain, the highest mean scores were observed for difficulty of throwing (mean = 45.58) and difficulty of lifting heavy objects (mean = 36.45). Moderate mean scores were noted for shoulder pain (25.2), weakness or lack of strength (24.52), and shoulder stiffness (19.2). Lower mean scores were reported for shoulder instability (13.44), clicking or cracking sounds (14.11), catching or locking sensations (15.32), and the feeling that the shoulder may slip out (15.81).

In the sport, recreation, and work domain, difficulty with pushing and pulling showed a relatively higher mean score (29.11), followed by difficulty reaching above the head (16.8) and difficulty playing sports (14.11). Difficulty with usual work had a comparatively lower mean score (9.6). Regarding lifestyle factors, difficulty sleeping due to shoulder problems had a notable mean score of 22.42, while difficulties with carrying a bag (16.29) and driving (12.74) were moderately affected. Dressing was minimally affected, with a low mean score of 2.9. In the emotional domain, confidence being affected showed the highest mean score (28.15), followed by frustration with the

shoulder (17.9) and worry about the shoulder (17.66), indicating a moderate emotional impact associated with shoulder instability.

Table 6. Western Ontario Shoulder Instability Index values

WOSI measurement each from 100 score	Min	Max	Mean
Physical symptom			
Shoulder pain	0	70	25.2
Shoulder aching/throbbing	0	50	16.98
Weakness or lack of strength	0	80	24.52
Shoulder stiffness	0	70	19.2
Shoulder instability	0	40	13.44
Clicking, cracking or noise	0	50	14.11
Catching, locking or jerking	0	50	15.32
Feeling shoulder may slip out	0	60	15.81
Difficulty of lifting heavy object	0	80	36.45
Difficulty of throwing	10	80	45.58
Sport/recreation/work			
Difficulty of playing sport	0	50	14.11
Difficulty with usual work	0	20	9.6
Difficulty of reaching above head	0	60	16.8
Difficulty with pushing and pulling	0	60	29.11
Lifestyle			
Difficulty with dressing	0	20	2.9
Difficulty sleeping due to shoulder	0	100	22.42
Difficulty of driving	0	50	12.74
Difficult of caring bag	0	40	16.29
Emotion			
Frustration with shoulder	0	50	17.9
Confidence affected	0	100	28.15
Worry about shoulder	0	50	17.66

5.7 Level of functional outcome by patient report

The majority of patients demonstrated favorable outcomes, with 53 participants (85%) classified as having good to excellent shoulder functional outcomes. In contrast, only 9 patients (15%) had a fair functional outcome.

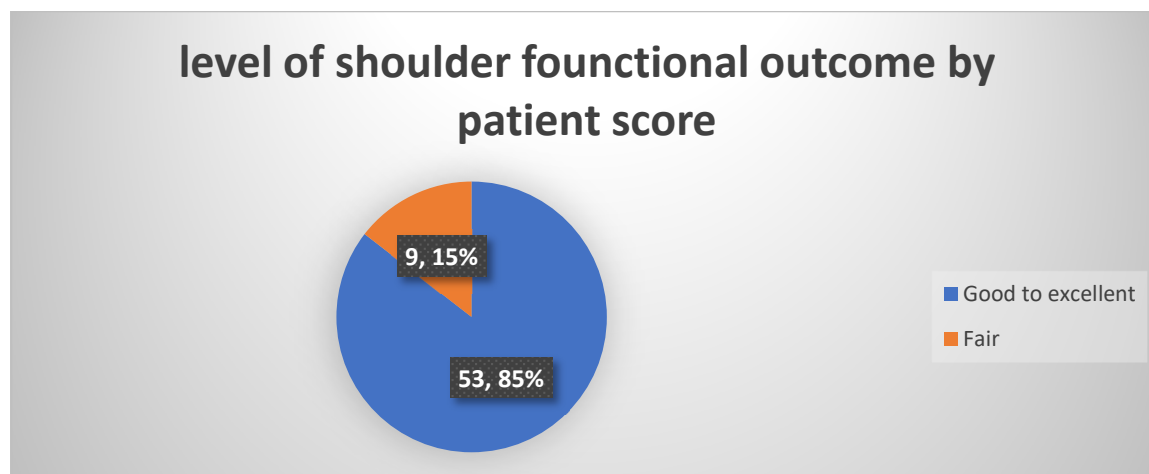


Figure 1. Pie chart showing level of functional outcome of the Laterjet procedure by patient reported WOSI score

5.8 Rowe measurement

The stability domain, with a maximum possible score of 50 points, showed a high mean score of 44.58, with observed values ranging from 35 to 50. The motion domain, measured out of 20 points, had a mean score of 16.85, with scores ranging from 10 to 28. The function domain, with a maximum of 30 points, demonstrated a mean score of 25.7 and ranged from 20 to 30.

Table 7. ROWE score value

ROWE measurement	Min	Max	Mean
Stability (50point)	35	50	44.58
Motion (20 point)	10	28	16.85
Function (30point)	20	30	25.7

5.9 Physician report functional outcome

Nearly half of the participants, 30 patients (48%), achieved an excellent ROWE score, indicating optimal shoulder stability, motion, and function. A comparable proportion, 29 patients (47%), had a good outcome. Only a small number of patients, 3 (5%), were classified as having a fair outcome.

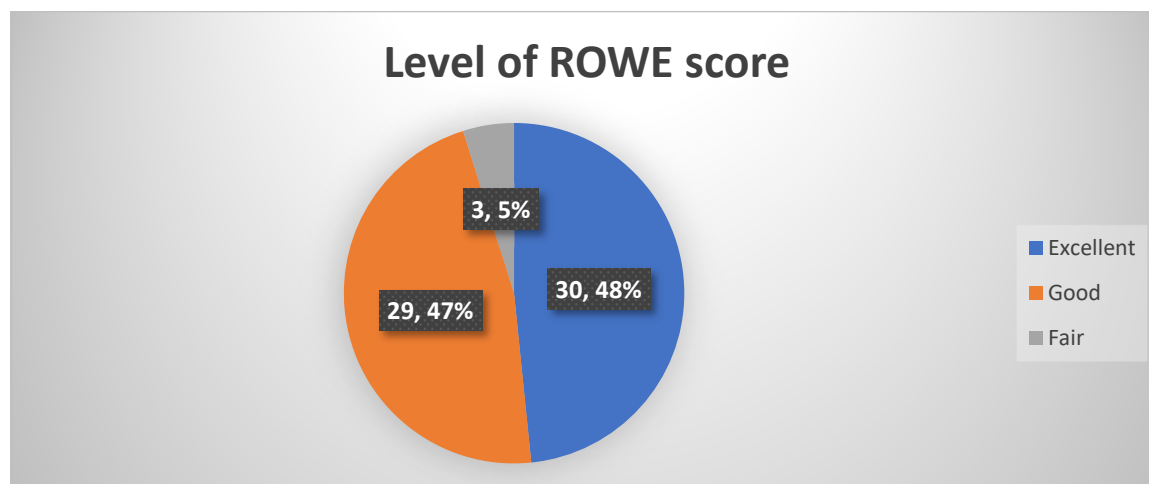


Figure 2. Pie-chart showing the distribution of physician reported ROWE score functional outcome categories after the Latarjet procedure

5.10 The relation between physician and patient reported functional outcome

Among patients with a fair ROWE score outcome, 2 (66.7%) had a fair WOSI score, while 1 (33.3%) had an excellent WOSI score. For those with a good ROWE score outcome, 7 (24.1%) had a fair WOSI score, and the majority, 22 (75.9%), had an excellent WOSI score

Table 8. The relation between physician and patient report functional outcome

WOSI score	Rowe score outcome		
	Fair	Good	Excellent
Fair	2(66.7%)	7(24.1%)	0
Excellent	1(33.3%)	22(75.9%)	30(100)

5.11 The relation between physician functional outcome with demographic and clinical variable

There was no significant difference in outcomes based on sex, with males achieving fair, good, and excellent scores in 5.2%, 46.6%, and 48.3% of cases, respectively, compared to females with 0%, 50%, and 50% ($p = 0.896$). participants aged 18–30 years had fair, good, and excellent outcomes in 4.3%, 50%, and 45.7%, respectively, while those aged 30–42 years had 6.3%, 37.5%, and 56.3% ($p = 0.684$). Participants' address also showed no significant association with outcomes

(Addis Ababa: fair 7.7%, good 46.2%, excellent 46.2%; outside Addis Ababa: fair 0%, good 47.8%, excellent 52.2%; $p = 0.389$).

In contrast, the mechanism of the first dislocation was significantly associated with Rowe scores ($p = 0.006$). Participants with fall-down accidents had fair, good, and excellent outcomes in 4.3%, 45.7%, and 50%, respectively, whereas those with road traffic accidents achieved 0%, 40%, and 60%, and injuries sustained during exercise resulted in 0%, 66.7%, and 33.3%. Notably, all participants with electric shock injuries had fair outcomes. Affected shoulder (left vs. right) and history of seizure surgery were not significantly associated with outcomes ($p = 0.423$ and 0.896 , respectively).

Receiving postoperative rehabilitation at a physiotherapy center was significantly associated with Rowe score outcomes ($p = 0.019$). Among participants who underwent rehabilitation, 2% had fair outcomes, 52.9% had good, and 45.1% had excellent outcomes, compared to 18.2%, 18.2%, and 63.6%, respectively, among those who did not receive rehabilitation.

Table 9. The relation between physician functional outcome with demographic and clinical variable

Variable	Rowe score outcome			P-value
	Fair	Good	Excellent	
Sex				0.896
Male	3(5.2)	27(46.6)	28(48.3)	
Female	0	2(50)	2(50)	
Age in years				0.684
18-30	2(4.3)	23(50)	21(45.7)	
30-42	1(6.3)	6(37.5)	9(56.3)	
Address of the participants				0.389
Addis Ababa	3(7.7)	18(46.2)	18(46.2)	
Out of Addis Ababa	0	11(47.8)	12(52.2)	
Mechanism of the Injury of the first dislocation				0.006
FDA	2(4.3)	21(45.7)	23(50)	
RTA	0	2(4.)	3(60)	
Injury while exercising	0	4(66.7)	2(33.3)	

Fighting injury	0	2(50)	2(50)	
Electric shock injury	1(100)	0	0	
Affected shoulder				0.423
Left	2(80)	13(52)	10(40)	
Right	1(2.7)	16(43.2)	20(54.1)	
History of seizure surgery				0.896
Yes	0	2(50)	2(50)	
No	3(5.2)	27(46.6)	28(48.3)	
Received postoperative rehabilitation at physiotherapy center				0.019
Yes	1(2)	27(52.9)	23(45.1)	
No	2(18.2)	2(18.2)	7(63.6)	

6. Discussion

This study demonstrated the significance of the Latarjet Procedure for the patient with recurrent anterior shoulder dislocation. It showed a favorable functional outcome where the majority of the patients achieved good to excellent based on the both patient-reported (WOSI) and physician reported (ROWE) functional measures.

In a ROWE score nearly half of the participants, 30 patients (48%), achieved an excellent Rowe score, while 29 patients (47%) achieved good outcomes, and only 3 patients (5%) had fair outcomes indicating optimal shoulder stability, motion, and function. So that, good to excellent in Rowe score was 95%. This suggested that the procedure effectively addresses both functional and mechanical components of the anterior shoulder instability, leading to reliable clinical assessment as reported by the clinicians. Furthermore, the outcome of the ROWE score implies that the surgical reconstruction successfully restored glenohumeral stability and prevented recurrence, thereby allowing the patient to regain their daily activities with improved shoulder performance.

The absence of the statistically significant association between the ROWE score and some independent variable such as age, duration of the instability, number of the preoperative dislocations and duration of surgery highlighted that the functional recovery is mainly determined

by the effectiveness of the surgical stabilization itself rather than preoperative factors or demographic variables.

On the other hand, in WOSI score, 53 patients achieved 85% of good to excellent, showing that patient achieved fewer physical symptoms and not effecting their daily activities with less emotional burden. So based on WOSI score 85% of the patient have achieved good to excellent functional outcomes following the Latarjet procedure. This finding showed that the majority of the patients have a significant improvement in shoulder related quality of life with a negligible residual pain, instability and functional limitation during the daily activity, sports and work. This results directly reflects the patient's own perception of functional recovery rather than physician assessment alone. This higher proportion of the WOSI score has suggested the Latarjet procedure is highly effective in assessing the clinical impact of recurrent anterior shoulder instability. This adds a meaningful improvement of both function and the overall physical wellbeing of the patients. In addition to that, the outcome based on WOSI score emphasized that the postoperative stability interprets into tangible benefits from the patient's perspective supporting the clinical value of the Latarjet procedure rather than the radiographic or physician assessment alone.

A strong and statistically significant negative correlation between the ROWE score and total WOSI scores have been observed in this study which is indicating a high level of agreement between the physician reported and the patient reported assessment of the functional outcomes. As higher ROWE scores represent a better clinical function of the patient while less WOSI score reports less patient reported disability. This inverse relationship confirms that the improvement and performance achieved during the clinical assessment are consistently reflected in patients' subjective perceptions of the function and quality of life. This negative correlation is validating the clinical effectiveness of the procedure both subjectively and objectively.

In our study, patient related factors such as number of dislocations and patient's age were not significantly associated with postoperative functional outcome as showed by ROWE and WOSI scores. The absence of significant age-related effect showed that the Latarjet procedure provided a similar functional improvement across the age groups. This signifies that it is due to its ability to restore both dynamic and static stability regardless of age-related variations, activity level or tissue quality. Likewise, the duration of shoulder instability prior to the surgery did not significantly influence the postoperative functional outcome, representing that delayed surgical intervention

may not necessarily compromise the postoperative functional recovery once adequate stabilization is achieved. The lack of significant association between the number of preoperative dislocations and functional outcome showed that the Latarjet procedure compensates the cumulative capsulolabral damage through its combined bony augmentation and sling effect. These findings collectively found that the biomechanical stability restored by the Latarjet procedure may outweigh the negative impact of the prolonged or recurrent episodes. This aligns with Cohort study done in France showed that the number of dislocations before surgery does not affect postoperative instability rates and reoperation rates after the Latarjet procedure (Hardy et al., 2020).

These findings proved that the majority of patients achieved satisfactory functional recovery after surgical stabilization, consistent with prior literature. A prospective cohort study in Iraq involving 16 patients with anterior shoulder instability who underwent the Latarjet procedure reported similarly high functional outcomes, with the majority achieving good to excellent Rowe and WOSI scores and a low rate of recurrent dislocations (27). Likewise, early clinical outcomes of the Latarjet procedure in an Egyptian population showed reliable stability and functional recovery, with minimal complications (Egyptian Orthopedic Journal, Mohmoud Massoud 2025). The high proportion of good and excellent outcomes in our study reflects the efficacy of the Latarjet procedure in restoring shoulder stability, particularly in patients with recurrent anterior instability.

Among patients with a fair Rowe score, 2 (66.7%) had fair WOSI scores, while 1 (33.3%) had an excellent WOSI score. For those with a good Rowe outcome, 75.9% had excellent WOSI scores. This strong negative correlation between total WOSI and Rowe scores ($r = -0.625$, $p < 0.001$) underscores the complementary role of patient-reported outcome measures in evaluating functional recovery. Similar correlations have been reported in multiple studies, including a systematic review of comparative outcomes of Latarjet versus free bone block procedures, which emphasized that patient-reported measures like WOSI and Rowe scores reliably reflect functional improvement after stabilization surgery (19).

Regarding sex, there was no significant difference in Rowe outcomes (males: fair 5.2%, good 46.6%, excellent 48.3%; females: fair 0%, good 50%, excellent 50%; $p = 0.896$). This aligns with findings from a South African retrospective case series of the modified the Latarjet procedure, which reported that while female patients may have slightly lower functional scores due to smaller

coracoid dimensions, gender alone is not a contraindication and does not significantly affect postoperative outcomes ((29), (28)). Both male and female patients achieved good functional recovery following the Latarjet stabilization, although anatomical variations may affect technical considerations.

Age was not significantly associated with outcomes (18–30 years: fair 4.3%, good 50%, excellent 45.7%; 30–42 years: fair 6.3%, good 37.5%, excellent 56.3%; $p = 0.684$). This finding contrasts with studies on nonoperative management of primary anterior shoulder dislocation, where younger age was a significant predictor of recurrent instability in Scotland (13). However, in our surgically treated cohort, age did not affect postoperative functional outcomes, suggesting that surgical stabilization with the Latarjet procedure mitigates the influence of age-related recurrence risk. A systematic review of prognostic studies on nonsurgical management similarly highlighted that younger patients have higher recurrence rates, but surgery effectively restores function regardless of age (14).

The participants' address also did not significantly influence outcomes (Addis Ababa: fair 7.7%, good 46.2%, excellent 46.2%; outside Addis Ababa: fair 0%, good 47.8%, excellent 52.2%; $p = 0.389$). This finding suggests that access to surgical care and postoperative rehabilitation may have been relatively uniform across locations in this cohort, minimizing disparities in functional recovery.

Mechanism of the first dislocation was significantly associated with Rowe outcomes ($p = 0.006$). Fall-down accidents were the most common mechanism (46 patients, 74.2%), followed by injury during exercise (6 patients, 9.7%), road traffic accidents (5 patients, 8.1%), fighting injuries (4 patients, 6.5%), and electric shock (1 patient, 1.6%). Notably, the patient with an electric shock injury had a fair outcome, highlighting the impact of high-energy or atypical mechanisms on functional recovery. This is consistent with prior studies showing that severe trauma or high-energy mechanisms can negatively affect both soft tissue and bony stabilization, potentially compromising outcomes if not addressed surgically (28). Similarly, literature suggests that sports-related injuries and falls are common mechanisms for anterior shoulder instability and generally respond well to surgical stabilization (23).

Affected shoulder (left vs. right) and history of seizure surgery were not significantly associated with outcomes ($p = 0.423$ and 0.896). All participants were right-hand dominant, and the right

shoulder was slightly more affected (59.7%). While seizure disorder is a recognized risk factor for recurrent dislocation due to uncontrolled muscle contractions, appropriate surgical stabilization can provide comparable outcomes. A US cohort study of patients with epilepsy reported that arthroscopic Latarjet stabilization improved functional outcomes similarly to non-epileptic patients, provided postoperative seizure control was maintained published in American Journal of Sports Medicine *Lika Zidzishili 2022*. Another study done by Thon et al revealed that the patient with seizure and those without seizure after the Latarjet procedure had a similar postoperative functional outcome (25). In our study, only 4 patients had a seizure history, limiting the statistical power to detect a difference.

Receiving postoperative rehabilitation at a physiotherapy center was significantly associated with Rowe outcomes ($p = 0.019$). Among patients who underwent rehabilitation, 52.9% achieved good outcomes and 45.1% excellent outcomes, whereas those without rehabilitation had higher proportions of fair outcomes (18.2%). This reinforces the established role of structured physiotherapy in promoting shoulder range of motion, strength, and functional recovery after stabilization procedures (16). Similarly, the South African retrospective study (2017–2020) highlighted that delayed surgical intervention or fewer rehabilitation sessions did not increase recurrence rates but optimal physiotherapy improved functional scores (34).

The stability, motion, and function domains of the Rowe score showed high mean values (stability 44.58/50, motion 16.85/20, function 25.7/30), indicating good restoration of shoulder mechanics postoperatively. These findings are consistent with multiple international studies evaluating the Latarjet procedure. For example, a meta-analysis by Wang et al. (2023) reported low recurrence rates (<5%) and high functional scores in athletes undergoing the Latarjet stabilization for glenoid bone defects $\geq 20\%$ (23). Long-term studies from France also confirmed durable stability and excellent functional outcomes 20 years postoperatively(15).

In terms of recurrence and preoperative risk, our cohort aligns with prior literature reporting that recurrent dislocations typically occur within the first two years after the primary injury, particularly in younger males (13). The majority of patients in our study had experienced 6–10 dislocations prior to surgery (56.5%), emphasizing the need for surgical intervention to prevent further instability and functional impairment.

Strength of the study

This study has several strengths

- i. It is the first multicenter study which was conducted from both a public tertiary trauma center and a private orthopedic specialty center which improved generalizability of the findings.
- ii. This study utilized validated outcome measures which combined patient reported and physician reported outcome tools allowing comprehensive assessment of functional outcome.
- iii. The relatively long study period (five years) enabled medium term functional outcomes of the Latarjet procedure.
- iv. Identification of the paramount of postoperative rehabilitation and the mechanism of the injury as significant predictors provide clinically meaningful and actionable understandings.
- v. The study addresses the important clinical problem in a resource limited settings where late presentation and limited access to the arthroscopic stabilization are common.
- vi. This research contributes locally studied evidence, helping guide orthopedic practice and policy in Ethiopia and similar settings.

Limitation of the Study

- b. The study was Retrospective design
- c. Sample size was relatively small, particularly certain subgroups such as patients with seizure disorder and female patients, limiting statistical power
- d. Radiographic assessment of the graft union, position, and degenerative changes was not included.
- e. The Follow-Up duration was variable among patients

7. Conclusion

The Latarjet procedure provides reliable restoration of shoulder stability, motion, and function in patients with recurrent anterior shoulder instability. In this study, the majority of participants (85%) achieved good to excellent functional outcomes as measured by the Rowe score, which strongly correlated with patient-reported WOSI scores ($r = -0.625$, $p < 0.001$). Postoperative

rehabilitation and mechanism of first dislocation were significant predictors of functional recovery.

8. Recommendations

It should be ensured a structured postoperative rehabilitation for all patients to maximize functional recovery and shoulder stability.

Early surgical intervention should be considered for patients with recurrent dislocations, particularly following high-energy or atypical mechanisms of injury.

Use combined outcome measures both clinician-assessed (Rowe score) and patient-reported (WOSI) for comprehensive evaluation of postoperative recovery.

Further research is recommended to evaluate long-term functional outcomes and recurrence rates, especially in patients with seizure disorders or high-risk trauma mechanisms.

Radiologic evaluation of graft position, union and arthritic changes should be conducted in future studies.

Future researches should adopt prospective study design with larger sample size and longer follow-up periods.

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10.Assurance of Principal Investigator

I, the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisors in the course of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research.

Name of the student: Dr. Khadar Abdi Abdillahi

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: Dr. Mahder Eshete

Signature: _____

Date: _____

Approval of the Co-Advisor

Name of the primary advisor: Dr. Mamo Deksis

Signature: _____

Date: _____

11. Annex

Informed consent

My name is **Dr. Khadar Abdi**, a final-year Orthopedics and Traumatology Surgery resident at St. Paul's Hospital Millennium Medical College (SPHMMC). I am conducting research entitled:

“Functional Outcome of Recurrent Anterior Shoulder Dislocation Treated with the Latarjet Procedure in AaBET and Dream hospitals, Addis Ababa, Ethiopia.”

I would like to inform you kindly that your name and personal identifiers will **not** be mentioned in the study, and all the information you provide will be kept **confidential** and used **only for research purposes**. Your participation will be very valuable in helping us achieve the objectives of this study. However, you have the **full right to decline or withdraw** from the study at any time if you are not interested, without any negative consequences to your treatment or care.

Are you willing to participate in the study? 1) Yes 2) No

Patient Questionnaire for Functional Outcome Study

Title: Functional Outcome After the Latarjet Procedure for Recurrent Anterior Shoulder Dislocation

Instructions: Please answer all questions truthfully. All information will be kept confidential.

Section A: Demographic Information

Item	Response
Patient ID	
Age (years)	
Sex (Male/Female)	
Occupation	
Dominant Hand (Right/Left)	

Section B: Clinical History

Item	Response
------	----------

Which shoulder is affected? (Right/Left)	
Number of dislocations before surgery	
Duration of shoulder instability (years)	
Previous shoulder surgery? (Yes/No)	
If yes, specify	
History of seizure disorder Yes/No	
If yes, how many months have you been free seizure episodes	
Time since Latarjet procedure (months/years)	
Did you get postoperative rehabilitation at physiotherapy center Yes/No	
If yes, how many weeks?	
Have you returned pre-injury activities after the operation	

Section C: Functional Outcome Assessment

Western Ontario Shoulder Instability Index (WOSI) – Questionnaire

Instruction to patient:

For each question, please put a number on the line (0–100) how much difficulty your shoulder has given you over the past week.

0 = No problem | 100 = Worst problem

Section 1: Physical Symptoms (10 items)

Question

Score (0–100)

1. Shoulder pain

2. Shoulder aching/throbbing

3. Weakness or lack of strength
4. Shoulder stiffness
5. Shoulder instability/giving way
6. Clicking, cracking, or noise
7. Catching, locking, or jerking
8. Feeling shoulder may slip out
9. Difficulty lifting heavy objects
10. Difficulty throwing

Subtotal (0–1000)

Section 2: Sports / Recreation / Work (4 items)

Question	Score 0–100
----------	-------------

1. Difficulty playing sports
2. Difficulty with usual work
3. Difficulty reaching above head
4. Difficulty pushing/pulling

Subtotal (0–400)

Section 3: Lifestyle (4 items)

Question	Score 0–100
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1. Difficulty dressing
2. Difficulty sleeping due to shoulder
3. Difficulty driving
4. Difficulty carrying bag/backpack

Subtotal (0–400)

Section 4: Emotions (3 items)

Question

Score 0–100

1. Frustration with shoulder
2. Confidence affected
3. Worry about shoulder

Subtotal (0–300)

Final Calculation

Raw Total (0–2100): _____

WOSI %: $(1 - \text{Raw Total}/2100) \times 100 = \text{_____}\%$

Interpretation: >75% Good to Excellent, 50–75% Fair, < 50% Poor

Annex 3: Detailed Functional Outcome Questionnaires

Study: Functional Outcome After Latarjet Procedure for Recurrent Anterior Shoulder Dislocation

Instructions: Please fill out each section accurately. Patient-reported sections are to be answered by the patient; clinician-measured sections are for clinician completion.

C4: Rowe Score

Purpose: Assess stability, motion, and function after shoulder instability surgery.

Domain	Points	Patient/Clinician Response
Stability	0–50	
Motion	0–20	
Function	0–30	
Total Rowe Score (0–100)		

Interpretation: 90–100 Excellent, 75–89 Good, 51–74 Fair, 0–50 Poor

Patient Signature: _____ Date: _____

Clinician Signature: _____ Date: _____