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RESEARCH ARTICLE OPEN ACCESS

Outcomes and Efficacy of the Bristow-Latarjet Technique in Shoulder Instability: A Case Series

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Abstract
Objective: The glenohumeral joint is the most mobile in the human body because of its structural anatomy. This mobility renders the joint susceptible to dislocation, most commonly anterior dislocation. Various surgical options exist to address this condition, including open and arthroscopic procedures. The Bristow-Latarjet procedure is an open, non-anatomical repair technique used for anterior shoulder instability. This case series aimed to evaluate the clinical outcomes of the Bristow-Latarjet procedure in patients with anterior shoulder instability.
Methods: In this case series, sixteen patients with anterior shoulder instability underwent the Bristow-Latarjet operation between January 2016 and November 2017. The follow-up period was 11.5 ± (range: 9–15) months. Clinical outcomes were evaluated using the Rowe score and the Western Ontario Shoulder Instability Index (WOSI), with complications recorded.
Results: There was significant improvement in both outcome measures postoperatively. The preoperative Rowe score was 35.5 ± 12.26, which increased to 86.93 ± 4.67 postoperatively. Similarly, the WOSI score decreased from 62.95 ± 6.62 preoperatively to 17.43 ± 4.91 postoperatively. Three-fourths of the patients achieved an excellent Rowe score, 18.75% had a good score, and 6.25% had a poor score. Two patients experienced unexplained pain during activity, four patients exhibited a limitation in external rotation (without affecting daily activities), and one patient experienced re-dislocation.
Conclusion: The Bristow-Latarjet procedure provides a viable treatment option for anterior shoulder instability, offering significant improvements in clinical outcome measures with a low rate of complications.

Keywords: Bristow-Latarjet procedure, Anterior shoulder instability, Open surgery, Rowe score, WOSI

Plain English Summary

The shoulder joint is the most mobile in the human body because of its structural composition. This mobility makes the joint dislocation. There are several types of surgery available for treatment, including open or minimally invasive surgical procedures. Bristow-Latarjet operation is an open, non-anatomical repair of the shoulder joint used for anterior instability. This study aimed to evaluate the results of Bristow-Latarjet operation use for anterior shoulder instability. Sixteen patients underwent Bristow-Latarjet operations between January 2016 and November 2017. The mean follow-up period was 11.5 months (9-15 months). Rowe score, a patient-reported outcome measure used to assess shoulder function and instability, and Western Ontario Shoulder Instability Index (WOSI) were used for assessment. There was significant improvement in both the Row score and WOSI among patients who had Bristow-Latarjet operations. Open surgical treatment of anterior shoulder instability by Bristow-Latarjet operation is a viable treatment option which has shown good results with few complications.

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Background

The anterointernal dislocation is the predominant kind, accounting for 11% of all shoulder injuries across all age groups. Chronic anterior glenohumeral instability is prevalent in athletes and the general population. The primary goal of its treatment is to minimize the occurrence of recurrences, reduce complications, and ensure the reproducibility of the procedure. Various surgical procedures have been found and documented to achieve the goal of treatment (1, 2).

Shoulder stability depends on passive and active stabilizers. Passive stabilizers include the glenoid labrum, the capsule and its ligamentous thickenings, the bony architecture, and intra-articular negative pressure. The labrum and ligaments play a critical role in the stability of the shoulder joint. According to available statistical data, the annual incidence rate of shoulder dislocation is almost 12/100,000. The incidence rate is up to 17/100,000 when the recurrent cases are considered. The anterior-inferior type of shoulder dislocation is widespread and reported in almost 95% of shoulder dislocation cases. All other types contributed only 5%, including 3% for posterior dislocation. Concerning the etiology, shoulder dislocation is either traumatic or non-traumatic (3, 4, 5). A Bankart lesion refers to the injury of the anteroinferior labrum that occurs in conjunction with a shoulder dislocation (3). Severe shoulder dislocations can lead to this injury in up to 90% of cases. Factors such as male sex, age under 20 at the time of initial dislocation, time until surgery, hypermobility, and ligament quality also influence the likelihood of recurrence (3, 6).

Evaluation of patients is performed by history where key questions are used (7, 8) and physical examination performed (8, 9). An important assessment tool is imaging; radiographs, CT scanning, and MRI all play an important role in the evaluation process of patients with recurrent dislocation (9). Treatment modalities for the recurrent dislocations of the shoulder and instability are varied. There are different modalities of treatment of recurrent dislocation and instability of the shoulder joint. These include rehabilitation and surgical intervention. Surgery is usually indicated when there is frequent dislocation, particularly painful ones. Another indication is subluxation. Evidence is growing worldwide toward early surgical intervention in younger adults who had acute (traumatic) dislocation and demand to practice physical activities (10).

There are two main types of operations currently applied: anatomical and non-anatomical repair; anatomical repair aims to restore the labrum to the normal location and reestablish right tension in the ligaments and capsule of the shoulder. However, the anatomic repair is employed either by the classical Bakart procedure or the capsular-shift procedure. Most open surgeries include combined Bakart and capsular-shift approaches (11, 12, 13). Concerning the non-anatomic procedure, the goal is shoulder stabilization by compensation for capsule-labral and osseous injury for restoration of stability. In clinical practice, the Bristow-Latarjet technique is a true example of non-traumatic stabilization (14, 15).

Latarjet surgery with the mini-open technique becomes a good choice in patients who are at greater risk of recurrence. In Bankart, Burkhart, and De Beer-type repairs, 4% of recurrences were reported without bone defects, 67% with bone defects, and up to 89% in contact athletes (8). In 1993, in the Journées Lyonnaises de l'épaule, a case series was published with 160 patients who underwent Latarjet surgery and were followed up for 4 years, and recurrences were observed in 1.2%, with results measured by the Duplay-Rowe scale (79%, excellent-good; 15%, medium, and 6%, poor). Regarding satisfaction, 97% reported complete satisfaction, and 87% had a return to sports (3, 6).

The Patte-Walsh modification, which transfers the coracoid to the subscapularis muscle without fixation, provides a "triple blockade" effect and is suitable for patients at higher risk of recurrence. For this reason, this article aims to describe the clinical and surgical characteristics of 18 patients who underwent Latarjet surgery for recurrent shoulder dislocation in a fourth-level institution in Bogotá between 2010 and 2012 (16).

Despite the availability of multiple surgical approaches for managing recurrent anterior shoulder instability, there remains a lack of consensus on the optimal technique- especially in terms of balancing stability with the risk of complications. The Bristow-Latarjet procedure, while promising as a non-anatomical stabilization method, has been evaluated in relatively small patient cohorts, leading to insufficient evidence regarding its long-term efficacy and safety. This study addresses that gap by providing a detailed analysis of clinical and surgical outcomes in a consecutive series of patients treated with the Bristow-Latarjet technique, thereby offering insights into its effectiveness and guiding future clinical decision-making.

Materials and Methods

Study design and patient selection

This case series was conducted to evaluate the clinical outcomes of the Bristow-Latarjet procedure for anterior shoulder instability. The study included all consecutive adult patients with traumatic anterior shoulder instability treated at

the upper extremity unit of Al-Wasity Teaching Hospital, Baghdad, between January 2016 and November 2017. The study period was intentionally limited to 2016 - 2017 to allow for a uniform surgical technique and to ensure that all patients had a minimum follow-up period (9 - 15 months). Cases from 2018 onward were not included to maintain consistency in follow-up duration and the management protocol.

Inclusion criteria
Adult patients with a documented history of traumatic anterior shoulder dislocation with recurrent episodes. Radiological evidence of shoulder instability confirmed by plain X-ray and MRI.

Exclusion criteria
A history of uncontrolled epilepsy (unless adequately controlled or disclosed), Prior shoulder joint surgery, Multidirectional or posterior instability and Radiographic evidence of osteoarthritis.

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Surgical Procedure and Perioperative Management
All patients underwent the standardized Bristow-Latarjet procedure under general anesthesia. Preoperatively, patients received prophylactic intravenous antibiotics. Intraoperatively, after osteotomy of the coracoid process, the graft was transferred and fixed to the anterior glenoid rim using two screws, ensuring an optimal graft position for stabilizing the shoulder. Postoperative management consisted of a continuation of antibiotics, standardized wound care, and a structured rehabilitation protocol initiated at predetermined intervals.

Outcome measures
Clinical outcomes were assessed using two validated instruments, both preoperatively and postoperatively.

Rowe Score
This clinician-administered tool evaluates shoulder stability, range of motion, and overall function (17). The Rowe score is expressed on a scale from 0 to 100, where higher scores indicate better outcomes. The scoring is typically divided into components assessing:
Stability: Evaluates the tendency for dislocation or subluxation.
Motion: Assesses the range of motion relative to normal values.
Function: Considers pain, strength, and the patient's ability to perform activities of daily living.
Based on these components, outcomes are commonly classified as follows: poor (<50), fair (50–74), good (75–89), and excellent (90≤).

Western Ontario Shoulder Instability Index (WOSI)
WOSI is a patient-reported questionnaire specifically designed to assess the quality of life in individuals with shoulder instability. It consists of 21 items divided among four domains: Physical Symptoms, Sport/Recreation, Lifestyle, and Emotional Well-Being. Each item is scored on a scale from 0 to 100, where 0 indicates no impact and 100 indicates the worst possible impact on quality of life. The total score is presented as a percentage, with lower scores representing better shoulder stability (18).

Data Collection and Statistical Analysis
Data were prospectively collected on patient demographics, clinical history, surgical details, and postoperative outcomes. Follow-up evaluations were performed at a mean of 11.5 ± (standard deviation) months (range: 9–15 months). The following statistical analyses were performed:

Descriptive Statistics
Continuous variables (e.g., age, follow-up duration, and outcome scores) were summarized using the mean and standard deviation (Mean ± SD). Categorical variables (e.g., gender, affected side, and outcome categories) were reported as frequencies and percentages.

Inferential Statistics
Differences between preoperative and postoperative scores were assessed using the paired t-test, with a significance level set at $p < 0.05$. Furthermore, comparisons of categorical outcomes (such as the distribution of Rowe score categories) were performed using the Z-test for proportions. Statistical analysis was conducted using SPSS software version 20.

Results
In this study, all participants have recurrent traumatic anterior shoulder instability. The mean follow-up period was 11.5 months (9-15). The mean age of patients was 26.06 (18-35) years. The mean age of patients at first dislocation was 22 (17-29) years, and the mean number of the recurrent dislocation was 13.1 (5-25).
No significant difference was found between the dominant and non-dominant shoulder (p value> 0.05). The Western Ontario Shoulder Instability index (WOSI) showed a highly significant reduction after surgery compared to its value before surgery. The mean WOSI before surgery was 62.95% ± 6.615, and after surgery was 17.43±4.911. The mean Rowe score showed a highly significant increase after surgery where it was 35.5%±12.261 before surgery and increased

to 86.93%±4.668 after surgery. From other points of view, after surgery, 3 patients (18.75%) had good and 12 (75%) had excellent Rowe scores, while only one patient (6.25%) had a poor score and recurrent dislocation (P. value <0.05). Two patients (12.5%) had unexplained pain during activity. Regarding limitation of movements, four patients (25%) showed limitation of the external rotation not affecting job and daily activity, however, the reported rate was statistically insignificant (p value > 0.05). None of the patients had non-union or loosening of the coracoid process. On the other hand, none of our studied groups had neurovascular injuries. All these findings are summarized in Tables 1, 2, 3, 4 and 5.

Table 1: Descriptive statistics of patients' age, age at first dislocation, follow-up period, and the number of recurrent dislocations

Variable	Mean	SD	Range
Age (year)	26.06	4.50	18 - 35
Gender	Male: 12 (75%) Female: 4 (25%)		
Occupation	Manul Workers: 10 (62.5%) Office Workers: 4 (25%) Students :2(12.5%)		
Age at first dislocation (year)	22	2.50	17 - 29
Follow-up period (months)	11.50	1.50	9 – 15
number of recurrent dislocations	13.10	5.00	5 - 25

Table 2: Distribution of Traumatic recurrent anterior shoulder instability patients according to the affected side

Affected side	N	%	P. value
Non-dominant shoulder	5	31.3	0.211 ns*
Dominant shoulder	11	68.8	
Total	16	100.0	

Table 3: Comparison of pre- and postoperative WOSI score and Rowe score of the studied group

		Mean	SD	P. value*
WOSI score (%)	Pre-operation	62.95	6.62	< 0.001 hs
	Post operation	17.43	4.91	
Rowe score (%)	Pre-operation	35.50	12.26	< 0.001 hs
	Post operation	86.93	4.67	

*Paired t-test used in comparisons

Table 4: Distribution of the studied group according to the level of Rowe score

Row score (%) scale	N	%	p-value
Poor	1	6.3	0.002 hs
Good	3	18.8	
Excellent	12	75.0	
Total	16	100.0	

Z test for proportions was applied, P. value < 0.01, hs: highly significant

Table 5: Postoperative outcomes regarding dislocation, pain during activity, and limitation of external rotation in the study group

Outcome		No.	%	P. value
Dislocation	No dislocation	15	93.75	0.001 hs*
	Re-dislocation	1	6.25	
Unexplained pain during activity	Yes	2	12.5	0.004 hs*
	No	14	87.5	
Limitation of the external rotation	Yes	4	25.0	0.077 ns
	No	12	75.0	
Total		16	100.0	

Binomial (Z) test, hs: highly significant, ns: not significant

Discussion

Our case series demonstrates a significant improvement in shoulder function following the Bristow-Latarjet procedure. The mean Rowe score increased from 35.5 ± 12.26 preoperatively to 86.93 ± 4.67 postoperatively, while the mean WOSI score decreased from 62.95 ± 6.62 to 17.43 ± 4.91. Notably, only one patient (6.25%) experienced recurrent dislocation. The observed recurrence rate of 6.25% is in line with several previous reports. Hovelius L. et al. (19) in 1983, Barry TP et al. (20) in 1985, Young DC and Rockwood CA (21) in 1991, and Levinge C. (22) in 2000 similarly reported recurrence rates around 6%. In contrast, studies by Millet PJ. et al. (23) in 2005 and Burkhart SS et al. (24) in 2007 noted slightly lower rates (approximately 4%). Our findings, although derived from a relatively small cohort, fall within the expected range of outcomes reported in the literature.

Our results diverge from other studies (8, 25) in which no recurrences were observed. For instance, Hovelius et al. (26) in 2004 and G Matthes et al. (27) in 2007 did not report any recurrence of dislocation. In our series, the single recurrence occurred in a patient with uncontrolled epilepsy- a condition not disclosed during preoperative evaluation—which is consistent with observations by Raiss et al. (28). Furthermore, A. Ersen et al. (29) have reported higher re-dislocation rates among epileptic patients, a finding that supports our interpretation.

Two patients reported unexplained pain during activity, a complication that has been documented previously by TR Lenter et al. (30). Additionally, four patients experienced a slight limitation in external rotation, which did not affect their daily activities. This finding agrees with G Matthes et al. (27) and might reflect non-compliance with postoperative physiotherapy, as suggested by Millet PJ. et al. (23). Importantly, no neurovascular injuries were reported in our series, a result that contrasts with the 10% incidence noted by Shah et al. (31) in patients with prior shoulder surgery. Moreover, the absence of loose screws or non-union of the coracoid process aligns with Russo et al. (32), who emphasized that accurate graft positioning and the use of two screws are key factors in preventing non-union.

The limitations of this study include the small sample size (n = 16) and the absence of a control group inherent to the case series design. Additionally, the relatively short mean follow-up period of 11.5 months limits the assessment of long-term outcomes. Future research with larger cohorts and extended follow-up is necessary to further elucidate the durability and safety of the Bristow-Latarjet procedure.

Conclusion

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 Row score and Western Ontario Shoulder Instability Index. We recommend using the Bristow-Latarjet procedure for glenohumeral joint instability with attention to the proper position of graft and careful selection of patients. Further studies for a longer period are needed to evaluate long-term results.

List of abbreviations

AP: Anteroposterior (X-ray view)
CT: Computed Tomography
IV: Intravenous
MRI: Magnetic Resonance Imaging
p-value: Probability Value (used in statistical significance)
SD: Standard Deviation
SPSS: Statistical Package for the Social Sciences
WOSI: Western Ontario Shoulder Instability Index

Declarations

Ethical approval and consent to participate

This study was approved by the Ethical Committee of the Faculty of Medicine, Jabir Ibn Hayyan Medical and Pharmaceutical University (Approval No. 462 JMU: 6th March 2024). All procedures involving human participants were conducted following the ethical standards of the institutional research committee and the 1964 Helsinki declaration and its later amendments. Written informed consent was obtained from all patients before participation in the study. Participation was voluntary, and patients were assured of confidentiality and the right to withdraw at any stage without any effect on their medical care.

Consent for publication

All the authors gave consent for the publication of the work under the Creative Commons Attribution- Non-Commercial 4.0 license.

Availability of data and materials

The data and materials associated with this research will be made available by the corresponding author upon reasonable request.

Competing interests
The authors declare that they have no competing interests.

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Author contributions
The author was responsible for all aspects of the study and approved the final version of the paper.

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