

Arthroscopic Evaluation and Management of Anterior Shoulder InstabilityHarshit Mehta¹, Saurabh Bansal², Umang Agrawal³, Abhishek Kishore⁴¹Associate Professor, Department of Orthopaedics, Krishna Mohan Medical College and Hospital, Mathura²Associate Professor, Department of Orthopaedics, Krishna Mohan Medical College and Hospital, Mathura³PG Resident, Department of Orthopaedics, Krishna Mohan Medical College and Hospital, Mathura⁴PG Resident, Department of Orthopaedics, Krishna Mohan Medical College and Hospital, Mathura

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Abstract

Background: Due to the rise in incidence of road traffic injuries resulting in shoulder dislocations, young people are increasingly experiencing shoulder instability. Among them, anterior shoulder instability is the most prevalent and can be identified both radiologically and clinically. In order to treat these injuries arthroscopically and compare their clinical success to open repair of anterior shoulder instability, the paper aims to assess the association between these clinical and radiological findings and arthroscopic findings. A complex network of both static and dynamic components supports the glenohumeral joint and helps to stabilize it. When these structures are compromised, dislocation and frequently recurring instability result. The glenoid labrum, the glenohumeral ligaments encircling the joint, the congruency of the humeral head and glenoid, and negative intra-articular pressure are some of the structures that give the glenohumeral joint static stability.

Aim: To assess 15 cases of anterior shoulder instability clinically, and radiologically, and correlate it with the arthroscopic evaluation of the instability, and compare open repair and arthroscopic repair of these injuries.

Material and Method: The goal of the current study was to assess the outcomes of arthroscopic shoulder surgery using suture anchors for the Bankart lesion. The study population consisted of all patients who had a history of recurrent shoulder dislocation and were presenting to the orthopedic outpatient department. The study included a total sample size of 15 individuals with recurrent shoulder dislocations with Bankart lesions. The institute's Ethical Committee gave the study its blessing. Written informed consent was obtained from the participants before the selected subjects were visited and the questionnaire was delivered. Following reduction, the patient was given a universal shoulder immobilizer, check radiographs were taken, and it was advised that they follow up for an assessment after two weeks of immobilization.

Results: It was observed the hat mean Rowe score at 3 weeks, 6 weeks, 12 weeks, 6 months and 12 months was 42.24±8.10, 58.15 ±5.11, 72.16 ±4.33, 81.90 ±1.22 and 86.43 ±1.88 respectively. The ROWE score shows statistically significant differences at different time intervals. It was observed that the mean UCLA score preoperative and postoperative at one-year follow-up was 7.62 ±1.24 and 32.66 ±2.10 respectively. The UCLA score shows a statistically significant difference in preoperative and postoperatively. Both these patients underwent an additional Bristow Latarjet capsulolabral repair as the bone loss was less than 25% whereas using the Tasaki technique the coracoid process was transferred and fixed to the anterior glenoid.

Conclusion: The current study's patient distribution based on functional result revealed that the majority of the patients had great functional outcomes. Additionally, it was shown that most patients reported a satisfactory subjective outcome. Therefore, arthroscopic repair is a great way to treat dislocation of the shoulder. A less invasive procedure that results in less surgical trauma and blood loss, arthroscopic Bankart repair improves operating time, perioperative morbidity, narcotic use, hospital stay, missed work, and reduces the number of complications while also costing less for cosmetic procedures and surgery.

Keywords: Anterior shoulder instability, Bankart operation and Arthroscopic findings

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Introduction

The glenohumeral joint, also known as the shoulder joint, is a ball and socket joint that forms a junction between the humeral head and the glenoid fossa of

the scapula, connecting the axial and appendicular skeletons. It is surrounded by a synovial membrane. When the humeral head is not anatomically present in the glenoid fossa, it is

referred to as shoulder instability. [1] The muscles and ligaments that surround the shoulder joint exert stresses that keep the humerus head in the glenoid fossa. Asymmetrical forces occurring on the head may cause these forces to be disturbed, putting the head under stress and possibly dislocating it from the joint. These disruptions may result from traumatic or atraumatic pressures. Traumatic dislocations, on the other hand, are caused by abrupt forces that cause ligamentous disruptions and can occur anteriorly, posteriorly, or in any other direction, depending on the mode of injury to the shoulder. Atraumatic dislocations are caused by repeated overhead use, different ligament laxities, and congenital anomalies of the shoulder. On the other hand, anterior dislocations account for about 98% of traumatic dislocations. [2]

Of all the joints in the human body, the glenohumeral joint has the widest range of motion, hence maintaining its stability is crucial to its operation. [3] The shoulder joint is an inherently unstable ball-and-socket joint, and it is susceptible to a variety of injuries. This joint has a complex anatomy and its stability is conferred by a combination of bone, soft tissue, and muscular structures. It is therefore the most commonly dislocated joint, with an overall incidence of approximately 24/100,000 per year [4], and over 90% of dislocations are anteriorly displaced. [5] In young patients between 20 and 29 years of age appears the highest incidence of shoulder dislocation [6] and this group of patients has also the highest recurrence rate. [6-7] Traumatic glenohumeral instability is characterized by subjective or objective subluxation or dislocation following an initiating incident, which is then either spontaneously resolved or treated by a medical practitioner. [8] Atraumatic instability can be brought on by repetitive motion or widespread ligamentous laxity, as in athletes who throw objects overhead. Less frequently than anterior and posterior instabilities, inferior and multidirectional instabilities have been reported to present with pain or instability along with a sulcus sign or inferior subluxation of the humeral head. [9,10] Although there are patients who suffer an initial shoulder dislocation and never experience a second episode of shoulder instability [11] a significant percentage present with recurrent instability that results in morbidity and decreased functionality, with respect to the demands placed on the joint during everyday, occupational, and athletic activities. [12]

Glenohumeral dislocation is a prevalent condition that affects 2% of people in general. The primary consequence of anterior glenohumeral dislocation is recurrent instability of the shoulder, which accounts for 74% of recurrences in individuals between the ages of 20 and 40. A vast arc of motion is made possible by this geometry, which is

functionally advantageous, but it also has an inherent instability that can lead to severe anterior shoulder dislocation. As a matter of fact, 1.7% of the general population has been reported to have traumatic shoulder instability. [13,14] Over 90% of all shoulder dislocations are anterior dislocations, which are by far the most prevalent type of glenohumeral instability. Men, contact athletes, and enlistees have three higher rates.

Therefore, following a shoulder dislocation in a young patient, there is a significant risk of developing a lesion at the anteroinferior glenoid labrum, also referred to as the Bankart's lesion. In this case, the patient may exhibit symptoms typical of instability, such as a sensation that the shoulder joint is giving way under overhead abduction. These patients have positive relocation and apprehension tests upon clinical assessment. These individuals make great candidates for shoulder stabilization surgery.

Material and Methods

The present study was a prospective study undertaken to evaluate the results of arthroscopic repair of the Bankart lesion of the shoulder with suture anchors. All the patients presenting to the OPD department of Orthopedics with a history of recurrent shoulder dislocation were included as the study population. A total sample size of 15 patients with recurrent dislocation of the shoulder with Bankart lesion was included in the study. The study was approved by the Ethical Committee of the institute. The selected subjects were visited and the questionnaire was administered after written informed consent was obtained from the participants.

Out of the total 15 patients who presented with shoulder dislocation in our institute 11 were relocated using muscle relaxants and sedation whereas 4 patients were taken to the OT and reduction was done under General anesthesia. Post-reduction a universal shoulder immobilizer was given and check radiographs were done the patient was advised to follow up after 2 weeks of immobilization for examination. For all patients admitted with recurrent shoulder dislocation a careful history was collected from the patient and/or attendants to reveal the mechanism of injury and the severity of trauma.

After 2 weeks of follow up the patients were clinically examined in the OPD and a shoulder examination was done where we assessed for:

- Apprehension test.
- Relocation test.
- Release test.

Patients have then advised an MRI shoulder in all cases and a CT scan was done if there was a

suspected bone loss. After getting an MRI done the findings collaborated with radiological findings, and clinical tests and patients were counseled for arthroscopic repair of shoulder instability. Rowe and UCLA scores were obtained preoperatively for those willing to undergo arthroscopic evaluation.

All patients were followed up at an interval of 3 weeks for the first 6 months followed by every 3 months for the next 4 follow up and then every six months for a minimum time of 2 years in total. At each visit of the patient, we evaluated the patient by

1. Evaluating the range of motion.
2. Rowe and UCLA score was assessed.
3. Patient was clinically assessed by doing the drawer test and the apprehension test.
4. A standard shoulder radiograph was taken.
5. Post-operative X-ray After Shoulder Arthroscopy

Inclusion Criteria

- Recurrent anterior dislocation of the shoulder joint after the initial trauma.
- Bankart's lesion is arthroscopically confirmed.
- All patients above 18 years of age with recurrent dislocation of the shoulder with Bankart lesion.

Exclusion Criteria

- Posterior instability.
- Multidirectional instability.
- Previous shoulder surgeries.
- Age > 65 years.
- Septic and rheumatoid arthritis.
- Significant defects of the humeral head (greater than 30%) requiring bone graft or rotational osteotomy of the proximal humerus.
- Arthritis of shoulder.

Statistical Analysis

The patients were assessed using the ROWE score and ULCA score and Statistical analysis were performed. The data obtained was coded and entered into Microsoft Excel Worksheet. Data collected in the study were analyzed using a statistical package for the social sciences (SPSS) software for windows version 20. The categorical data were expressed as rates, ratios, and proportions, and comparison was done using the chi-square test or Fisher's exact test. The continuous data were expressed as mean \pm standard deviation (SD) and an independent sample 't' test was used to compare the data.

Result

Table 1: Distribution of patients according to ROWE Score

Variable	Mean ROWE Score	SD
3 weeks	42.24	8.10
6 weeks	58.15	5.11
12 weeks	72.16	4.33
6 months	81.90	1.22
12 months	86.43	1.88

The above table showed the distribution of patients according to the ROWE score. It was observed the hat mean Rowe score at 3 weeks, 6 weeks, 12 weeks, 6 months and 12 months was 42.24 ± 8.10 , 58.15 ± 5.11 , 72.16 ± 4.33 , 81.90 ± 1.22 and 86.43 ± 1.88 respectively. The ROWE score shows statistically significant differences at different time intervals.

Table 2: Distribution of patients according to UCLA Score

Variable	Preoperative	Postoperative
UCLA Score	7.62 ± 1.24	32.66 ± 2.10

The above table showed the distribution of patients according to UCLA score. It was observed that the mean UCLA score preoperative and postoperative at one-year follow-up was 7.62 ± 1.24 and 32.66 ± 2.10 respectively. The UCLA score shows a statistically significant difference in preoperative and postoperatively.

Table 3: Distribution of patients according to Functional outcome of patients

Functional outcome	No. of Patients	Percentage
Excellent	10	70.00
Good	03	15.00
Fair	02	10.00
Poor	01	05.00
Total	15	100

The above table showed the distribution of patients according to functional outcome. It was observed that functional outcome was 70%, 15%, 10%, and 5% excellent, good, fair, and poor respectively. Out of the 10 patients with Hillsach's lesion, 8 of them

had a bone loss of less than 10% so were operated on for arthroscopic Bankart's repair and the remaining 2 patients had a bone loss of 13% and 15%. Both these patients underwent an additional Bristow Latarjet capsulolabral repair as the bone

loss was less than 25% whereas using the Tasaki technique the coracoid process was transferred and fixed to the anterior glenoid.

Discussion

The goal of the current study was to assess the outcomes of arthroscopic shoulder surgery using suture anchors for the Bankart lesion. The study population consisted of all patients who had a history of shoulder dislocation with a Bankart lesion and who presented to the outpatient department and emergency room. The study included a total sample size of 15 individuals over the age of 18 who had an arthroscopic repair for a Bankart lesion and recurrent shoulder dislocation.

In the study done by Kumaraswami Ramulu Dussa et al [15] on descriptive analysis of the functional outcome of arthroscopic repair of recurrent anterior shoulder dislocation observed that among forty patients the average age of patients was 28.96 years (range 20–40 years) Similar findings were seen in a study done by Ildeu Afonso et al 2012 [16] on functional assessment of arthroscopic repair for recurrent anterior shoulder instability observed that among 49 patients who underwent arthroscopic repair of anterior shoulder instability mean age was 30 years.

In the study done by J. Lutzner et al 2009 [17] on functional outcomes after open and arthroscopic Bankart repair for traumatic shoulder instability observed majority of patients were male (87%). Sugaya et al. 2003 [18] examined 100 patients with recurrent anterior glenohumeral instability and found a Bankart lesion in 97% of their patients and an osseous Bankart lesion in 50%. In another study, where 25 patients with acute shoulder dislocation participated, Bankart and Hill-Sachs lesions were present in 23 cases, whereas loose bodies were noted in 8 cases. [19] In the report of Norlin, in acute shoulder dislocations, the incidence of Bankart and Hill-Sachs lesions was 100%. [20]

Weimin Zhu et al. 2014 [21] inspected thirty-one patients with recurrent anterior shoulder dislocation inspected by arthroscopy. In this study, the patients were divided into two groups: 17 with a shoulder dislocation and hyper-laxity (the hyperlaxity group) and 14 with only traumatic shoulder dislocation (the trauma group). There was no significant difference in the overall incidence of labral injuries and SLAP lesions between the two groups. However, there was a significant difference in the incidence of Bankart lesions, ALPSA lesions, GLAD lesions, Hill-Sachs lesions, bony defects of the anteroinferior glenoid, and rotator cuff injuries between the two groups. Bankart injury occurred more frequently in the trauma group, and ALPSA lesions and glenolabral articular disruption injuries were more common in the hyper-laxity group.

Bone or cartilage injury of anteroinferior glenoid was more frequently found in the trauma group.

Yiannakopoulos et al. 2007 [22] did a comparative study between acute and chronic shoulder dislocation diagnostic arthroscopy findings which showed that recurrent shoulder dislocation had a higher chance (90%) of Bankart's and Hillsach's lesion than an acute dislocation. Although there have been cases of neurovascular injury after shoulder arthroscopy, one benefit of the procedure is that none of our patients experienced any intraoperative problems.

Trans glenoid sutures or bioabsorbable tracks were previously employed in arthroscopic methods described. With encouraging outcomes, more recent methods including capsular plication and suture anchor fixation have emerged in recent years. With suture anchors, the glenoid labrum and the glenohumeral ligament complex can be anatomically restored with the least amount of articular surface damage to the humeral head. Restoring stability to the glenohumeral joint and tension in the anterior-inferior glenohumeral ligament, capsular laxity can be addressed during the same procedure that addresses any superfluous or loose capsule. In the present study, it was observed that the total number of recalls was 15% with 10% of patients having redislocation without trauma and 5% with trauma.

A less invasive procedure that results in less surgical trauma and blood loss, arthroscopic Bankart repair improves operating time, perioperative morbidity, narcotic use, hospital stay, missed work, and reduces the number of complications while also costing less for cosmetic procedures and surgery. Compared to open surgical procedures, postoperative healing and rehabilitation occur more quickly. Stability is also maintained without sacrificing the postoperative range of motion. Patients can resume high-demand jobs or activities because they have strong functional range of motion, particularly external rotation.

Conclusion

The current study's patient distribution based on functional result revealed that the majority of the patients had great functional outcomes. Additionally, it was shown that most patients reported a satisfactory subjective outcome. Therefore, arthroscopic repair is a great way to treat dislocation of the shoulder. A less invasive procedure that results in less surgical trauma and blood loss, arthroscopic Bankart repair improves operating time, perioperative morbidity, narcotic use, hospital stay, missed work, and reduces the number of complications while also costing less for cosmetic procedures and surgery. Compared to open surgical procedures, postoperative healing and rehabilitation occur more quickly. Stability is also

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References

1. Tzannes A, Paxinos A, Callanan M, Murrell GAC. An assessment of the inter-examiner reliability of tests for shoulder instability. *Shoulder Elbow Surg.* 2004;13(1):18–23.
2. Rosa JRP, Checchia CS, Miyazaki AN. Traumatic anterior instability of the shoulder. *Revista brasileira de ortopedia. Rev Bras Orto.* 2017;52(5):513–20.
3. Labriola JE, Lee TQ, Debski RE, McMahon PJ. Stability and instability of the glenohumeral joint: The role of shoulder muscles. *J Shoulder Elbow Surg* 2005; 14(1): 32-8.
4. Krøner K, Lind T, Jensen J. The epidemiology of shoulder dislocations. *Arch Orthop Trauma Surg* 1989; 108(5): 288-90.
5. Smith TO. Immobilization following traumatic anterior glenohumeral joint dislocation: A literature review. *Injury* 2006; 37(3): 228-37.
6. Zacchilli MA, Owens BD. Epidemiology of shoulder dislocations presenting to emergency departments in the United States. *J Bone Joint Surg Am* 2010; 92(3): 542-9.
7. Chalidis B, Sachinis N, Dimitriou C, Papadopoulos P, Samoladas E, Pournaras J. Has the management of shoulder dislocation changed over time? *Int Ortho.* 2007; 31(3): 385-9.
8. Robinson CM, Dobson RJ. Anterior instability of the shoulder after trauma. *J Bone Joint Surg Br* 2004; 86(4): 469-79.
9. Cadet ER. Evaluation of glenohumeral instability. *Orthop Clin North Am* 2010; 41(3): 287-95.
10. Neer CS II, Foster CR. The inferior capsular shift for involuntary inferior and multidirectional instability of the shoulder: A preliminary report. *J Bone Joint Surg Am* 1980; 62(6): 897-908.
11. Werner AW, Lichtenberg S, Schmitz H, Nikolic A, Habermeyer P. Arthroscopic findings in atraumatic shoulder instability. *Arthroscopy* 2004; 20(3): 268-72.
12. Robinson CM, Howes J, Murdoch H, Will E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. *J Bone Joint Surg Am* 2006; 88(11): 2326-36.
13. Simonet WT, Melton LJ, Cofield RH, Ilstrup DM. Incidence of anterior shoulder dislocation in Olmsted County, Minnesota. *Clin Orthop Relat Res.* 1984;186: 186–91.
14. Boone JL, Arciero RA. Management of failed instability surgery: how to get it right the next time. *Orthop Clin North Am.* 2010;41 (3):367–79.
15. Dussa KR, Parekh AN, Belsare KS, et al. Descriptive analysis of the functional outcome of arthroscopic repair of recurrent anterior shoulder dislocation. *J. Evid. Based Med. Healthc.* 2016; 3(27), 1216-1221.
16. Ildeu Afonso de Almeida Filho, Marco Antônio de Castro Veado, Márcio Fim, Lincoln Vargas da Silva Correa. Functional Assessment of Arthroscopic Repair For Recurrent Anterior Shoulder Instability. *Rev Bras Ortop.* 2012;47(2): 214-217.
17. J. Lützner, F. Krummenauer, J. Lübke, S. Kirschner, K.-P. Günther, M. Bottesi. Functional Outcome After Open And Arthroscopic Bankart Repair for Traumatic Shoulder Instability. *Eur J Med Res* 2009;14: 18-24
18. Sugaya H, Moriishi J, Dohi M, Kon Y, Tsuchiya A. Glenoid rim morphology in recurrent anterior glenohumeral instability. *J Bone Joint Surg Am* 2003; 85(5): 878-84.
19. Hart WJ, Kelly CP. Arthroscopic observation of capsulolabral reduction after shoulder dislocation. *J Shoulder Elbow Surg* 2005; 14(2): 134-7.
20. Norlin R. Intraarticular pathology in acute, first-time anterior shoulder dislocation: An arthroscopic study. *Arthroscopy* 1993; 9(5): 546-9.
21. Zhu W, Lu W, Zhang L, et al. Arthroscopic findings in the recurrent anterior instability of the shoulder. *Eur J Orthop Surg Traumatol* 2014; 24(5): 699-705
22. Yiannakopoulos CK, Mataragas E, Antonogiannakis E. A Comparison of the Spectrum of Intra-articular Lesions in Acute and Chronic Anterior Shoulder Instability. *Arthroscopy.* 2007;23(9):985–90.