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Research Article

Assessing the Efficacy of Arthroscopic Bankart Repair for Recurrent Shoulder Dislocation

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Abstract

Background: Recurrent shoulder dislocation is a common injury with significant functional implications. The shoulder is one of the most common and frequently dislocated joints, accounting for more than 50% of all dislocations. The most common complication of shoulder dislocation is recurrent instability. It accounts for an average of 70-90% recurrence in patients aged 20-40 years. Arthroscopic Bankart repair has emerged as a popular surgical technique for its potential to restore stability and reduce re-dislocation rates.

Aim of the study: This study aims to assess the efficacy of this procedure through a comprehensive analysis of patient outcomes and complication rates.

Methods: This is a descriptive and prospective study, a total of 16 patients were enrolled and analyzed in this study who were undergone arthroscopic Bankart repair for recurrent shoulder dislocation. The study was conducted at the Department of Orthopedic, at National Institute of Traumatology and Orthopaedic Rehabilitation (*NITOR*), Dhaka, Bangladesh. The study duration was one year from January 2020 to December 2020. Every case is thoroughly examined, and a comprehensive study is done concerning anatomical status, hospital stay, functioning results, and complications in a proforma.

Result: The largest proportion of patients (31.25%) fell within the age group of 20-24 years, while 25.00% of patients were aged between 15-20 years. in the study population, with 87% of patients being male and 13% being female. The majority of injuries were attributed to sports activities (81.25%), while 12.50% resulted from falls from heights, and a single patient experienced an accidental road injury. The average surgery duration was 69.87 ± 17.19 minutes, and patients attended follow-up visits for an average of 7.76 ± 2.45 days. The study observed a recurrence rate of 37.50%, but 81.25% of patients expressed satisfaction with the treatment outcome.

Conclusion: In conclusion, this research study provides valuable insights into the efficacy of arthroscopic Bankart repair as a treatment option for recurrent shoulder dislocation. The findings highlight the procedure's effectiveness in reducing the risk of further dislocations and improving functional outcomes, emphasizing its significance in clinical practice.

Keywords: Efficacy; Arthroscopic; Bankart Repair and Recurrent Shoulder

Introduction

Recurrent shoulder dislocation is a common orthopaedic condition that can significantly impact an individual's quality of life and functional abilities. It occurs when the shoulder joint is forced out of its normal position due to trauma or inherent shoulder instability. The shoulder is one of the most common and frequently dislocated joints, accounting for more than 50% of all dislocations [1]. The most common complication of shoulder dislocation is recurrent instability. It accounts for an average of 70-90% recurrence in patients aged 20-40 years [2]. Many data have shown that the shoulder is highly susceptible to instability after the first traumatic dislocation [3,4]. The relative age of the young patient at the time of injury is the most crucial prognosis factor for recurrence [5]. During shoulder dislocations, the humeral head is forced chiefly anteriorly out of the glenoid cavity, detaching the fibrocartilaginous labrum from the anterior rim of the glenoid cavity. This detachment of the glenoid labrum is called Bankart's lesion. Bankart's lesion is the most common lesion requiring anterior shoulder instability treatment. Bankart lesion is found in 85 per cent of dislocations, most commonly in the right shoulder's two to six o'clock position and the six to ten o'clock position in the left shoulder. Arthroscopic Bankart repair has emerged as a widely accepted surgical technique for treating recurrent shoulder dislocation, aiming to restore stability and prevent further dislocations. This procedure involves reattaching the torn labrum, a ring of cartilage that surrounds the shoulder socket, to its original position. Bankart repair surgery is considered by many surgeons as the choice treatment for anterior instability, especially if it is due to traumatic causes [6]. A Bankart Shoulder Repair procedure is a surgical technique for the repair of recurrent shoulder joint dislocations. Within the procedure, the worn-out ligaments are reattached to the proper place in the shoulder joint to rebuild normal function. Because the torn capsule or labrum is repaired directly in the glenoid cavity [7,8]. The efficacy of arthroscopic Bankart repair has been of considerable interest among orthopaedic surgeons and researchers. Various studies have evaluated the outcomes of this surgical intervention, including rates of recurrent dislocation, postoperative pain, range of motion, and patient satisfaction. Understanding the effectiveness of arthroscopic Bankart repair is crucial for clinicians to make informed decisions and provide optimal treatment options to patients. Several studies have reported positive outcomes following arthroscopic Bankart repair. A systematic review by Hantes et al. (2019) examined 22 studies involving 1,266 patients and found a significant reduction in recurrent dislocations following the procedure [9]. The review also demonstrated improvements in pain scores and shoulder function postoperatively. Similarly, a retrospective study by Zeng et al. (2020) evaluated the long-term outcomes of arthroscopic Bankart repair in 118 patients and reported a low recurrence rate and satisfactory functional outcomes [10]. However, there is ongoing debate regarding the efficacy of arthroscopic Bankart repair. Some studies have raised concerns about the durability of the repair and the potential for recurrent instability over time. For instance, a study by Lafosse et al. (2018) reported a higher recurrence rate in contact and collision athletes than non-athletes, suggesting that the demands placed on the shoulder joint may influence surgical outcomes [11]. This study aims to assess the efficacy of arthroscopic Bankart repair for recurrent shoulder dislocation by examining the current literature, evaluating patient outcomes, and identifying potential factors that may influence the procedure's success. By critically analyzing the available evidence, this research aims to contribute to the existing body of knowledge and provide clinicians with valuable insights into the benefits and limitations of arthroscopic Bankart repair.

Methodology and Materials

This is a descriptive and prospective study, a total of 16 patients were enrolled and analyzed in this study who were undergone arthroscopic Bankart repair for recurrent shoulder dislocation. The study was conducted at the Department of Orthopedic at National Institute of Traumatology and Orthopaedic Rehabilitation *(NITOR),* Dhaka, Bangladesh. Our study included 16 patients, primarily males under the average age of 24 years (ranging from 18-35 years). A radiograph of the involved shoulder (anterior-posterior, axillary, and scapular Y view) and chest was done. Following clinical and radiological examination, Magnetic resonance imaging (MRI) of the concerned shoulder was performed to assess the rotator cuff's involvement and confirm our diagnosis. Informed consent was taken after explaining the procedure, complications, and intense rehabilitation protocol. Every case is thoroughly examined, and a comprehensive study is done concerning anatomical status, hospital stay, functioning results, and complications in a proforma.

Inclusion criteria

All patients above 18 years of age with recurrentdislocation of the shoulder with Bankart lesion.

Exclusion criteria

Exclusion criteria were shoulder pathologies such as Biceps rupture, Bony Bankart, and rotator cuff tear; significant defects of the humeral head (greater than 30%) requiring bone graft or rotational osteotomy of the proximal humerus; multidirectional instability and posterior instability of shoulder; arthritis of the shoulder.

Surgical procedure

Regional anesthesia was provided with interscalene block combined with general anesthesia. The patient was positioned in lateral decubitus position, and the arm was then suspended at 40º-50º of abduction and 10º-15º of forward flexion with sterile shoulder traction and rotation sleeve. The Joint was inspected for the evidence of substantial articular injury, concomitant injury to biceps origin, and rotator cuff tear along with the anteroinferior aspect of the labrum for the presence of Bankart lesion in all the patients. Arthroscopic procedure Following anesthesia and positioning of the patient appropriately, a spinal needle was inserted 1cm anterior to the corner of the anterior acromion to allow it to pass into the Joint in the rotator interval just anterior to the bicep's tendon. A small skin incision was made to insert a soft-walled crystal cannula fitted with a tapper-tip obturator. This 6mm soft cannula was inserted into the anterior mid-glenoid portal (AMGP), and the scope was inserted into the superior anterior portal; (ASP) for the anterior reconstruction. A liberator knife and shaver were used to debride frayed tissues and to mobilize the anterior labrum and capsule entirely from the neck of the glenoid. The anterior glenoid neck was later slightly abraded to expose cancellous bone, which becomes a bed for the newly attached anterior labral tissues for healing. The first pilot hole for the inferior most anchors was created by inserting a 2mm drill bit with a self-stopper, through the AMGP, on the face of the articular cartilage of the glenoid around the 5-o'clock position, down to the horizontal seating line. Depending on the extent and size of the detached labral tissue, one to two additional holes were drilled along the edge of the cartilage at 4:30 and 3:30 positions. It is ensured that the suture anchor is completely seated below the subchondral bone without risking breaking it off when inserting it into the hard bone of the glenoid. The anchor was screwed completely below the bone. This ensures that the anchor is 2 mm below the subchondral bone. While removing the screwdriver, care should be taken not to toggle or change the alignment. A crochet hook was inserted through the posterior cannula to retrieve one strand of the suture that exits the eyelet from the inferior anterior side of the anchor. A 45-degree curved spectrum suture hook loaded with a shuttle relay of 1 mm proline was inserted into the anterior mid-glenoid portal, and a healthy plication stitch was created through the anterior-inferior capsule tissue 1 to 2 cm below the anchor 1cm lateral from the labral edge.

All data were presented in a suitable table or graph according to their affinity. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for social science (SPSS) program, and Windows. Continuous parameters were expressed as mean ± SD and categorical parameters as frequency and percentage. Comparisons between groups (continuous parameters) were made by Student's t-test. Categorical parameters compared by Chi-Square test. The significance of the results as determined by a 95.0% confidence interval and a value of $P<0.05$ was considered to be statistically significant.

Result

According to the study findings, the largest proportion of patients (31.25%) fell within the age group of 20-24 years, while 25.00% of patients were aged between 15-20 years (Table 1). Figure 1 illustrates the distribution of genders in the study population, with 87% of patients being male and 13% being female. The majority of injuries were attributed to sports activities (81.25%), while 12.50% resulted from falls from heights, and a single patient experienced an accidental road injury (Table 2). Among the affected shoulders, the right shoulder was more frequently involved than the left. Figure 2 displays the range of motion (ROM) scores before and after the surgical procedure. The study recorded a 25% incidence of complications, with sepsis, recurrent instability, recurrent instability, and thrombosis each accounting for 6.25% (Table 3). The average surgery duration was

69.87 ± 17.19 minutes, and patients attended follow-up visits for an average of 7.76 ± 2.45 days. The study observed a recurrence rate of 37.50%, but 81.25% of patients expressed satisfaction with the treatment outcome (Table 4).

Age group (year)	Frequency	Percentage
15-20	4	25.00
20-24	5	31.25
25-29	3	18.75
30-34	2	12.50
35-40	2	12.50
Total	16	100.00

Table 1: Age distribution of the study population (N = 16).

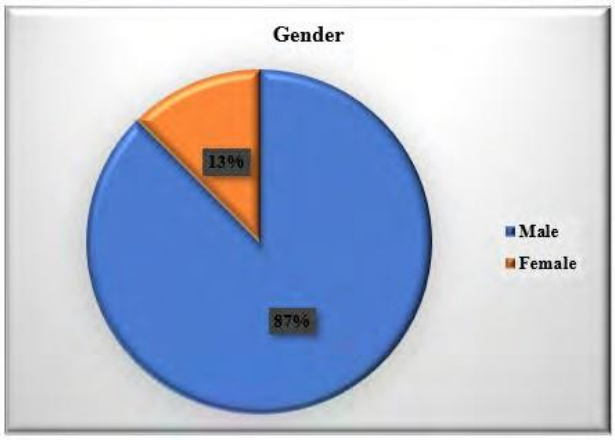

Figure 1: Gender distribution of the study population (N = 16).

Variables	Frequency	Percentage
Mode of injury		
Sports	13	81.25
Fall from height	2	12.50
Road accident	1	6.25
Shoulder involved		
Right	11	68.75
Left	5	31.25

Table 2: Mode of injury and injury side.

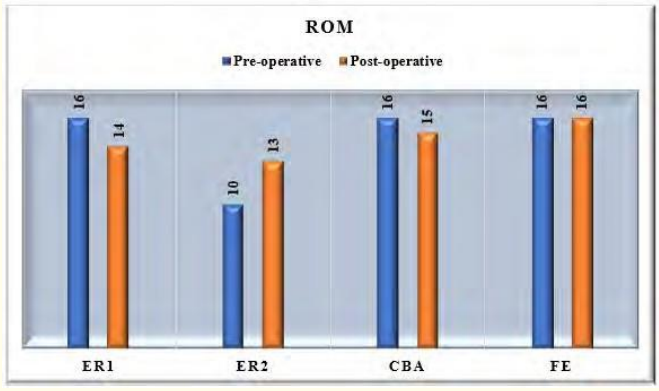

Figure 2: Pre-operative and post-operative range of motion.

ER1- External Rotation in adduction, CBA- Cross Body Adduction, ER2- External Rotation and FE- Forward Elevation.

Complication	Frequency	Percentage
Sepsis	1	6.25
Deep wound infection	0	0
Mobility problem in shoulder	1	6.25
Recurrent instability	1	6.25
Thrombosis	1	6.25
Mortality	0	0
Total	4	25

Table 3: Study complications.

Clinical outcome	Mean ± SD	Frequency	Percentage
Surgery duration (minutes)	69.87 ± 17.19	-	-
Re-occurrence	-	6	37.50
Follow-up visits (Days)	7.76 ± 2.45	-	-
Patients' satisfaction	-	13	81.25

Table 4: Clinical outcomes of the study.

Discussion

Anterior instability of the shoulder with a Bankart lesion was initially treated with open repair, a procedure performed by Bankart himself and published by Dickson and Devas in 1957

[1]. Over the past two decades, shoulder arthroscopy has evolved from a limited diagnostic tool to a surgical technique, offering arthroscopic stabilization for recurrent anterior instability. Various stabilizing techniques, including staple capulorraphy, transglenoid suture capsulorrhaphy, bioabsorbable tacks, and suture anchors, have been employed with varying degrees of success. Furthermore, our improved understanding of the multifactorial causes of glenohumeral instability and advanced imaging modalities have led to a personalized approach in managing patients with recurrent shoulder instability. Presently, the "modern" arthroscopic approach is defined by three principles: the use of multiple suture anchors (more than three), a proximal shift of the anterior capsule and capsular plication to address capsular laxity, and treatment of associated intra-articular pathologies such as rotator interval lesions, SLAP tears, and capsular rents [12]. With the utilization of modern techniques and anchors, the recurrence rate of instability in patients is approximately 7% (ranging from 4% to 17%), with 90% of patients returning to their preinjury level of sports participation [13]. These findings align with the results of our study, which also reported an overall recurrence rate of 6.8%. In 1957, Dickson and Devas published a study on fifty cases of recurrent shoulder dislocation that were operated upon by Bankart and colleagues between 1925 and 1954, concluding with a failure rate of 4% [1]. Another study by Bacilla et al. focused on a group of high-risk patients, including 40 young athletes and laborers, managed with arthroscopic suture anchor stabilization, and reported an impressive 7% recurrence rate [14]. In a prospective study conducted by Weber et al the comparison between arthroscopic suture anchor stabilization and open Bankart repair for the management of traumatic anterior glenohumeral instability revealed an 8% recurrence rate among the 40 patients who opted for arthroscopic stabilization. This group experienced decreased perioperative morbidity, increased external rotation, and a higher rate of return to throwing sports [15,16]. In contrast, the 92 patients who underwent open repair had a recurrence rate of 2%. Hoffmann et al reported on a study of arthroscopic shoulder stabilization using Mitek suture anchors, involving 30 patients followed up for 24 months [12,17]. They observed a recurrence rate of 12% and concluded that the failure rate was higher among individuals who had experienced 10 or more dislocations before the operation. Tan et al conducted a prospective study involving 130 patients who underwent arthroscopic Bankart repair and stabilization with absorbable and non-absorbable suture anchors [18]. The follow-up period was 2 years, and the study reported a redislocation rate of 6%. Cho et al compared the results of arthroscopic anterior shoulder stabilization between collision and non-collision athletes [19]. The study included 14 collision athletes and 15 non-collision athletes, with a mean follow-up period of 62 months. The recurrence rate was 6.7% in the non-collision group, while the collision group had a higher recurrence rate of 17.2%. Marquardt et al studied the results of 18 patients who underwent arthroscopic Bankart repair using bioabsorbable tacks for traumatic anterior shoulder instability [20]. The follow-up period was 8 years, and the study concluded that this approach offered reliable results with a failure rate of 5.6%, along with improved range of motion and shoulder function over a minimum follow-up of 7 years. Tjoumakaris et al conducted a retrospective comparison between arthroscopic Bankart repair and open Bankert repair [21]. The study included 93 out of 106 patients available for follow-up, with 69 undergoing arthroscopic repair and 24 undergoing open repair. The follow-up period ranged from 24 to 77 months. Both groups had one patient reporting recurrence, suggesting that modern techniques of arthroscopic Bankart repair have led to similar outcomes as open repair. In a systematic review and meta-analysis by Hobby et al, which included 62 studies comprising 3,044 arthroscopic operations, it was concluded that arthroscopic stabilization using suture anchors and bioabsorbable tacks had lower failure rates compared to stabilization with staples and the transglenoid suture technique [22]. The study also found that arthroscopic anterior stabilization using the most effective techniques had a failure rate similar to open stabilization after a 2-year follow-up period.

Limitations of the Study

Every hospital-based study has some limitations and the present study undertaken is no exception to this fact. The limitations of the present study are mentioned. One potential limitation of the study titled "Assessing the Efficacy of Arthroscopic Bankart Repair for Recurrent Shoulder Dislocation" could be the limited sample size. Due to the specific criteria for participant inclusion and the availability of suitable candidates, the study may have only been able to include a relatively small number of individuals, which could limit the generalizability of the findings to a broader population. Therefore, the results of the present study may not be

representative of the whole of the country or the world at large. The number of patients included in the present study was less in comparison to other studies.

Conclusion and Recommendations

In conclusion, the findings of this study support the effectiveness of open Bankart surgery in reducing pain and recurrence of shoulder dislocation. The results indicate that the use of Bankart surgery resulted in a significant improvement in shoulder functions for patients. These findings align with previous studies, further reinforcing the positive outcomes associated with this surgical approach.

Funding

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Conflict of Interest

None declared.

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