

Original Research Article

Evaluation of arthroscopic Bankart repair in recurrent shoulder dislocation

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ABSTRACT

Background: Our aim was to study the surgical and functional outcome and postoperative shoulder motion following, arthroscopic repair of the Bankart lesion of the shoulder with suture anchors.

Methods: This was a study of arthroscopic Bankart repair in recurrent anterior shoulder dislocation with suture anchors in 20 patients. Most of patients had symptoms for a period ranging from 1 to 2 years and 1- 4 recurrent dislocation episodes preoperatively. Necessary radiological and haematological investigations were done. The post-operative x-rays were evaluated and the post-operative rehabilitation evaluation done at 3 weeks, 6 weeks, 12 weeks, 6 months and 1 year, for any recurrence of symptoms.

Results: In our study of 20 patients, with the mean follow up period of 12 months, the mean Rowe score post-operatively improved to 94 from a pre-operative mean score of 56.25. Out of 20 patients none had episodes of recurrent dislocation. In 15 patients 3 suture anchors were used and in 5 patients 2 suture anchors used intra operatively. The range of movement – external rotation in 90° of abduction improved in 17 patients (85%).

Conclusions: We concluded that arthroscopic Bankart repair in recurrent anterior shoulder dislocation with suture anchors is effective in providing better shoulder function with range of movement and lower rate of recurrence.

Keywords: Arthroscopic, Bankart, Shoulder, Dislocation

INTRODUCTION

Shoulder joint is responsible for wide range of motion at various positions in three-dimensional space by utilizing the glenohumeral joint as a fulcrum. Shoulder is one of the most common and frequently dislocated joint in the body, accounting for more than 50% of all dislocations.¹ Most common complication of shoulder dislocation is recurrent instability. It accounts for an average of 70-90% recurrence in patients between age group of 20-40 years.² During shoulder dislocations, humeral head is mostly forced anteriorly out of glenoid cavity resulting in detaching fibro cartilaginous labrum from the anterior rim of glenoid cavity. This detachment of glenoid labrum is called Bankart's lesion. Bankart's lesion is the most

common lesion which requires treatment for anterior shoulder instability. Bankart lesion is found in 85 percent of dislocations, most commonly in the two to six o'clock position in the right shoulder and in the six to ten o'clock position in the left shoulder. Treatment is by reattachment of labro-ligamentous structure to the glenoid as glenoid labrum plays important role in maintaining stability of glenohumeral joint.³ Bankart treated anterior shoulder instability and Bankart lesion by open repair. Anterior shoulder instability can be treated either by open procedure or arthroscopic method.⁴ There has been growing interest in the arthroscopic management of anterior glenohumeral instability because of the advantages like less morbidity, shorter time of surgery, improved range of motion, improved cosmesis, and less

post operative pain.⁵ There has been concern about recurrent instability in patients treated with arthroscopic technique because of various techniques used for stabilization, like stabilization with Staple Capsulorrhaphy, Bioabsorbable Tacks, and Suture Anchor, but each one having their own merits and demerits. Better implants and refined techniques of arthroscopic stabilization with suture anchors resulted in patients with decreased perioperative morbidity, increased external rotation and an increased return to throwing sports. The purpose of present study is to verify functional outcome of the patients with recurrent dislocation of shoulder with Bankart lesion, treated with arthroscopic stabilization with suture anchors.

METHODS

Study design

Descriptive and prospective study of surgical and functional outcome following, arthroscopic repair of the Bankart lesion of the shoulder with suture anchors.

Study place and period

Study was done at SCB Medical College and Hospital between December 2016 and November 2018 after taking institutional ethical approval.

Selection criteria of patients

A sample size of 20 patients was selected using purposive sampling technique.

Inclusion criteria

All patients above 18 years of age with recurrent dislocation 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 proximal humerus, multidirectional instability and posterior instability of shoulder; arthritis of shoulder.

Thus our study included 20 patient, most of them were male under the average age of 24 yr (range from 18-35 years). 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 access the involvement of rotator cuff and to confirm our diagnosis. Informed consent was taken after explaining about the procedure, complications and intense rehabilitation protocol. Every case is thoroughly examined and a comprehensive study

is done with regard to anatomical status, hospital stay, functional result and complications in a proforma.

Surgical procedure

Regional anaesthesia was provided with interscalene block combined with general anaesthesia. Patient was positioned on lateral decubitus position and arm is then suspended at 40°-50° of abduction and 10°-15° of forward flexion with sterile shoulder traction and rotation sleeve. Joint was inspected for the evidence of substantial articular injury, concomitant injury to biceps origin and rotator cuff tear along with anteroinferior aspect of labrum for the presence of Bankart lesion in all the patients. Arthroscopic procedure Following anaesthesia and positioning of the patient appropriately, a spinal needle was inserted 1cm anterior to the corner of anterior acromion so as to allow it to pass into the joint in the rotator interval just anterior to biceps tendon. A small skin incision was made to insert smooth walled crystal cannula which is fitted with taper-tip obturator. This 6mm smooth cannula was inserted into the anterior mid glenoid portal (AMGP) and the scope was inserted into the anterior superior portal; (ASP) for the anterior reconstruction. Liberator knife and shaver was used to debride frayed tissues and to mobilize anterior labrum and capsule completely from the neck of glenoid. The anterior glenoid neck was later slightly abraded to expose cancellous bone which becomes 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 articular cartilage of the glenoid around the 5-o'clock position, down to the horizontal seating line. One to two additional holes were drilled along the edge of the cartilage at 4:30 and 3:30 o'clock positions depending on the extent and size of the detached labral tissue. It is ensured that the suture anchor is completely seated below the subchondral bone without risking breaking it off when inserting it in 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 screw driver care should be taken to 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 anterior inferior side of the anchor. A 45 degree curved spectrum suture hook loaded with a shuttle relay of 1 mm prolene was inserted into the anterior mid glenoid portal, and a healthy plication stitch created through the anterior-inferior capsule tissue 1 to 2 cm below the anchor 1cm lateral from the labral edge.

Statistical analysis

The variables were represented by frequencies (percents). Statistical analysis was done using Fischer's exact test. The analysis was performed using SPSS statistical software version 20.0. P<0.05 were considered statistically significant.

RESULTS

Majority of the patients are in the age group between 20-24 yrs. Most of the patients were males, 18 male (90%), and 2 (10%) females. Occupation: 12 patient (60%) were involved in significant occupation requiring overhead activity such as fisherman, student with sporting activities, agriculturist.

Table 1: Age, sex distribution, type of occupation and side involved.

	No of patients	Percentage (%)
Age group (year)		
15-20	5	25.0
20-24	6	30.0
25-29	5	25.0
30-34	2	10.0
35-40	2	10.0
Total	20	100.0
Sex		
Male	18	90
Female	02	10
Occupation		
High demand	12	60.0
Low demand	08	40.0
Total	20	100.0
Shoulder involved		
Right	14	70.0
Left	06	30.0
Total	20	100.0
Symptoms		
D	12	60.0
NP	06	30.0
P	02	10.0
Total	20	100.0

Side: Among 20 patient 12 (60%) patient had their right side involved, rest 8 (40%) patients had left shoulder involved.

Among 20 patients, 12 patients (60%) had discomfort, 6 (30%) patient had no pain and discomfort and only 2 (10%) patient had pain.

Among 20 patients, 12 (60%) patient had 5 to 9 episodes of pre-op dislocation, 6(30%) patient had 1 to 4 episodes of dislocation, 2 (10%) patients had dislocated 10 or more times preoperatively. In majority of patient 15 (75%), 3 suture anchor were used and rest of the patient 2 (25%) suture anchor were used.

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Table 2: Pre-op dislocation and no. of suture anchor used intra-operatively.

	Frequency	Percentage (%)
No. of cases		
06	1-4	30%
12	5-9	60%
02	>10	10%
No of suture anchor		
3.0	15	75.0
2.0	05	25.0
Total	20	100.0

ER1- external rotation in adduction CBA- cross body adduction ER2-external rotation in 90° abduction FE-forward elevation preoperatively 60% (12)patient had restriction in external rotation in 90° abduction. Postoperatively 85% (17) patient out of 20 attained full range of external rotation in 90°abduction by the end of 1 year. 2 (10%) patient had terminally restriction of external rotation in adduction (ER1) (Figure 1 and 2).

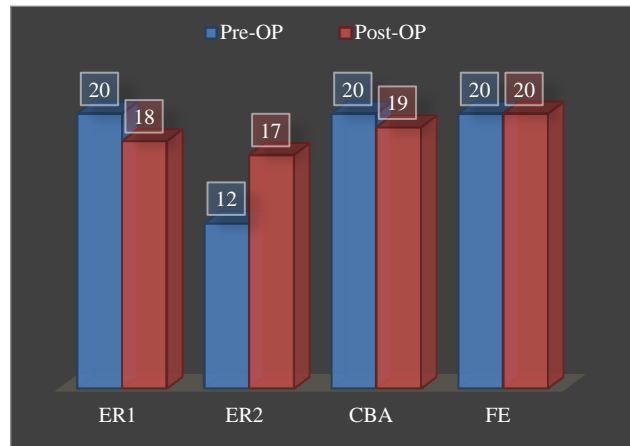


Figure 1: Pre-operative and post-operative range of motion.

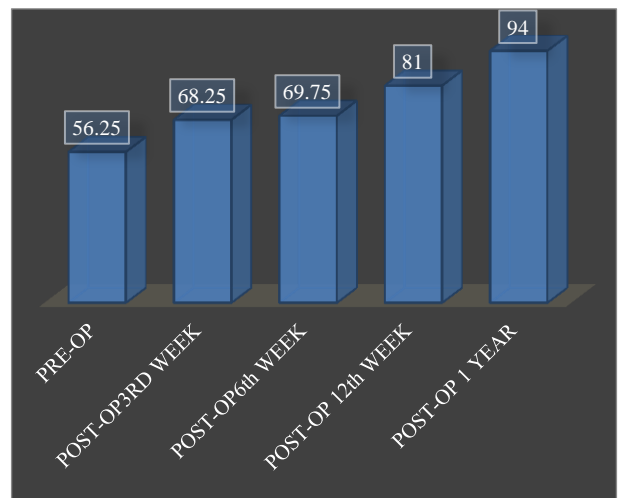


Figure 2: Total Rowe score pre to post surgery.

DISCUSSION

Anterior instability of shoulder with a Bankart lesion initially treated with open repair, as performed by Bankart himself, published by Dickson and Devas in 1957.¹ With the evolution of shoulder arthroscopy in the last two decades, from a limited diagnostic modality to a surgical tool, the arthroscopic stabilization for recurrent anterior instability with varying stabilizing techniques like staple capsulorrhaphy, transglenoid suture capsulorrhaphy, bioabsorbable tacks and the suture anchors varying success being reported. Modern suture anchor devices combined with a trend away from transglenoid sutures and metallic staples have been responsible for a great deal of success in more recent studies. In addition to these technical advancements, our understanding of the multifactorial etiology of glenohumeral instability and our ability to recognize complex injury patterns with advanced imaging modalities have led to a tailored approach to the patient with recurrent shoulder instability.

Actually, three principles currently define the “modern” arthroscopic approach: 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 (rotator interval lesions, SLAP tears, and capsular rents).⁵

With modern techniques and anchors, recurrent instability occurs in approximately 7% of patients (ranging from 4% to 17%), and 90% of patients return to their preinjury level of sports participation.⁶ The results obtained in our study are similar to those published in the most recent studies, with an overall recurrence rate of 7%. Dickson and Devas in 1957 published a study of Fifty cases of recurrent dislocation of the Shoulder, operated upon by Bankart and his colleagues from 1925 to 1954, concluded with a 4% failure rate.¹

Wolf et al were the first to describe the use of suture anchors (Mitek, Westwood, Massachusetts) for arthroscopic shoulder stabilization.^{2,7} Bacilla et al reported on a group of high risk patients who were managed with arthroscopic suture anchor stabilization, concluded with an impressive 7% recurrence rate in a study group that consisted of 40 young athletes and labourers.⁸ In a prospective study by Weber et al, where he compared arthroscopic suture anchor stabilization for the management of traumatic anterior glenohumeral instability compared with open Bankart repair concluded with 8% recurrence rate in the 40 patients who chose arthroscopic stabilization with decreased perioperative morbidity, increased external rotation, and an increased return to throwing sports, compared with 2% recurrence rate in the 92 patients who underwent open repair.^{4,9} Hoffmann et al reported a study of arthroscopic shoulder stabilization using mitek suture anchors in 30 patients followed up for a period of 24 months reported with a recurrence rate of 12% and concluded that increased

failure with 10 or more dislocations preoperatively.^{5,10} Tan et al concluded after conducting a prospective study in 130 patients with a follow up of 2 years, arthroscopic Bankart repair and stabilization with absorbable and non absorbable suture anchors with redislocation rate of 6% and no significant difference between usage of absorbable suture anchor to non-absorbable suture anchor.¹¹ Cho et al concluded after conducting a study to compare the results of arthroscopic anterior shoulder stabilization with collision and non collision athletes with mean follow up period of 62 months in 14 collision and 15 non collision athletes, recurrence rate of 6.7% in non collision group compared with collision group with a high recurrence rate of 17.2%.¹² Marquardt et al concluded after studying the results of 18 patients who underwent arthroscopic Bankart repair using bioabsorbable tacks for traumatic anterior shoulder instability followed up for 8 years, that arthroscopic Bankart repair for the treatment of recurrent traumatic anterior shoulder instability repair using bioabsorbable tacks offers reliable results with respect to rate of failure (5.6%), range of motion and shoulder function during a minimum follow up of 7 years.¹³ Tjoumakaris et al compared arthroscopic Bankart repair with open Bankart repair retrospectively in 93 patients available for follow up out of 106 patients, with 69 arthroscopic Bankart repair and 24 open repair, following it up for a period of 24-77 months, concluded with 1 patient from each group reporting with recurrence, improvements in the techniques of arthroscopic Bankart repair in the modern days no difference in outcomes between the arthroscopic and open groups.¹⁴ Hobby et al did a systematic review and metaanalysis of 62 studies including 3044 arthroscopic operations concluded that the failure rates are less in arthroscopic stabilization using suture anchors and bioabsorbable tacs, compared to arthroscopic stabilization with staples and transglenoid suture technique arthroscopic anterior stabilization using the most effective techniques has a similar rate of failure to open stabilization after 2 years of follow up.¹⁵

CONCLUSION

Our study showed that arthroscopic Bankart repair with the use of suture anchors is an effective treatment method, with good clinical outcomes, which provides excellent postoperative shoulder motion, and low recurrence rates.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Dickson JW, Devas MB. Bankart's operation for recurrent dislocation of shoulder. *J Bone Joint Surg (Br)*. 1957;39:114-9.

2. Adla DN, Shukla S, Pandey R. Clinical outcome of arthroscopic anterior stabilisation of shoulder using absorbable knotless suture anchors. *J Bone Joint Surg Br*. 2009;91(1):118.
3. Stoffelen DVC, Singhanian AK, Mievis J, Reynders P. Recurrent anterior shoulder instability, Results of the glenoid based Inferior capsular shift. *Acta Orthop Belg*. 2004;70:112-7.
4. Linters TR, Franta AK, Wolf FM, Leopold SS, Matsen FA. Arthroscopic Compared with open repairs for recurrent anterior shoulder instability. A systematic review and metaanalysis of the literature. *J Bone Joint Surg Am*. 2007;89:244-54.
5. Freedman KB, Smith AP, Romeo AA, Cole BJ, Bach BR Jr. Open Bankart repair versus arthroscopic repair with transglenoid sutures or bioabsorbable tacks for recurrent anterior instability of the shoulder: a meta-analysis. *Am J Sports Med*. 2004;6:1520-7.
6. Mohtadi NG, Bitar IJ, Sasyniuk TM, Hollinshead RM, Harper WP. Arthroscopic versus open repair for traumatic anterior shoulder instability: a metaanalysis. *Arthroscopy*. 2005;21:652-8.
7. Wolf EM, Wilk RM, Richmond JC: Arthroscopic Bankart repair using suture anchors. *Oper Tech Orthop*. 1991;1:184-91.
8. Bacilla P, Field LD, Savoie FH. Arthroscopic Bankart's repair in a high demand patient population. *Arthroscopy*. 1997;13:51-60.
9. Webber SC. Arthroscopic suture anchor repair versus Open Bankart repair in the management of traumatic anterior glenohumeral instability. *Arthroscopy*. 1996;12:382.
10. Hoffmann F, Rief G. Arthroscopic shoulder stabilization using Mitek anchors. *Knee Surg Sports Traumatol Arthrosc*. 1995;3:50-4.
11. Tan CK, Guisasola I, Machani B. Arthroscopic Stabilization Of The Shoulder: A Prospective Randomized Study of Absorbable Versus Nonabsorbable Suture anchors. *J Arthroscopic Related Surg*. 2006;22(7):716-20.
12. Cho NS, Hwang JC, Rhee YG. Arthroscopic Stabilization In Anterior Shoulder Instability: Collision Athletes Versus Noncollision Athletes. *J Arthroscopic Related Surg*. 2006;22(9):947-53.
13. Marquardt B, Witt KA, Gotze C. Long Term Results Of Arthroscopic Bankart Repair With Bioabsorbable Tacks. *Am J Sports Med*. 2006;34(12),1906-10.
14. Tjoumakaris FP, Abboud JA, Hasan SA, Ramsey ML, Williams GR, Arthroscopic and open Bankart repairs provide similar results. *Clin Orthop Relat Res*. 2006;446:227-32.
15. Hobby J, Griffin D, Dunbar M, Boileau P. Is Arthroscopic Surgery for Stabilisation of Chronic Shoulder Instability As Effective As Open Surgery? A Systematic Review and Meta-Analysis of 62 Studies Including 3044 Arthroscopic Operations. *J Bone Joint Surg (Br)*. 2007;89:1188-96.

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