

Functional outcome of Arthroscopic stabilization of shoulder instability.

Latif Khan, Col. Khalid Masood, Kamran Butt, Khalid Zulfiqar Qureshi, Muhammad Kashif Shafi, Belal Saadat, Karam Rasool Basra

ABSTRACT

Objective: The objective of this study was to determine the functional outcome of arthroscopic stabilization of anterior shoulder instability using anchor sutures.

Methods: It was a prospective study done at Hand and Upper Limb Surgery (HULS) Center CMH Lahore Medical College, from January 2017 till July 2018. We included 60 patients who underwent arthroscopic stabilization with the help of anchor sutures. Pre-operative assessment included detailed history, physical examination, joint hyper laxity, plain radiographs, MR-arthrogram and in some cases CT scan of the shoulder joint. Post operatively; functional outcome was evaluated by complete examination of both shoulders mobility, Rowe score, Oxford shoulder instability score and Constant score. Comparison was made with the normal one. Data was analyzed with SPSS ver. 21.

Results: Total patients were 60 (57 male and 3 female) and mean age at the time of operation 41.35 ± 13.86 (range 17-78) years. Right side was involved in 66.7% and dominant side in 70% patients. All patients were followed for minimum one year and mean follow up was 18.25 ± 3.5 (range 11-22 months). At final visit in the follow up the mean Rowe score was 92.48 ± 6.5 and 88.3% (53), 8.3% (5), 3.3% (2) belong to excellent, good and fair group respectively. Mean Oxford shoulder instability score was 43.03 ± 5.99 and 83.4% (50), 13.3% (8) and 3.3% (10) belong to excellent, good and fair group respectively. Mean Constant score was 91.7 ± 11.6 and 80% (48), 10% (6) 6.7% (4) and 3.3% (2) belong to excellent, good, fair and poor group respectively.

Conclusion: Arthroscopic shoulder stabilization is an expedient procedure with excellent functional results for recurrent shoulder dislocation. We strongly recommend it for anterior shoulder instability.

Keywords: Shoulder instability, Arthroscopy, Bankart lesion, Anchor sutures.

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INTRODUCTION

The shoulder joint is the most mobile joint of the human body and this may be the reason for its instability as there is little bony support.^{1,2} Shoulder dislocation is common with 2% incidence in general population. Anterior shoulder dislocation is the most common type and accounts for 90 to 98% while posterior dislocation accounts for only 2%.^{3,4}

Recurrence after first dislocation depends on patient age, forced overhead activity, return to contact sports, generalized hyper laxity and labral or osseous defect. There is 90% chance of recurrence in patient with age less than 20 years. The most common is bankart lesion which is avulsion of labrum from anteroinferior glenoid which is present in 97% of cases. Bony defect as small as 25% of glenoid and 30 to

40% humeral head defect are associated with recurrent instability.⁵

There are various conservative and operative options for traumatic shoulder dislocation. In 50 to 80% cases Bankart lesion heals after a period of immobilization for first dislocation but there are conflicting evidence regarding position and duration of immobilization of shoulder and recurrence rate is 17% to 96% especially in young athletes with conservative treatment.⁶⁻⁸

Open Bankart surgery was considered the gold standard by many surgeons because of its excellent results but it is associated with various complications like limited external rotation and secondary osteoarthritis and limited chances of return to sports. Result of early implants like metal screw and staple

were disappointing. Newer implants and techniques have better results which are comparable to open surgery.^{9,10}

Advantages of Arthroscopic stabilization are better identification of underlying pathology, less surgical trauma, better cosmesis, less pain, and early rehabilitation.

Our aim was to evaluate the functional outcome of arthroscopic stabilization of shoulder joint with anchor sutures for posttraumatic recurrent anterior instability.

Department of Orthopaedics, CMH Medical College, Lahore

Corresponding Author: Latif Khan

Corresponding E-mail: lateefkhan21@yahoo.com

METHODS

We analyzed the data of all those in which suture anchors were used for stabilizing their shoulder joints, from January 2017 till July 2018 at Hand and Upper Limb Surgery (HULS) Center, CMH Lahore Medical College, were analyzed. Inclusion criteria were recurrent anterior shoulder instability after initial trauma and Bankart lesion on MR-arthrogram which was confirmed by diagnostic arthroscopy prior to formal procedure. Exclusion criteria were patients with rotator cuff tear on MRI, multidirectional instability, posterior instability and bony banker degenerative changes in joint. Patients having humeral and glenoid bony defects more than 30 percent were also excluded from the study.

Prior permission of the study was taken from the Institutional Review Board (IRB). Informed consent was taken from all the study participants. Pre-operatively all patients were physically examined and sulcus sign, apprehension test, job's relocation test and signs of joint hyper laxity were assessed. Range of motion was measured with hand held goniometer. Radiological examination included plain radiographs in anteroposterior, scapular lateral and axillary and MR-arthrogram. CT scan was performed in few cases having bony Bankart or Hill Sachs lesion to evaluate loss of bone.

Range of shoulder motion was recorded with goniometer at the final follow up visit and functional outcomes were evaluated according to Rowe, Constant and Oxford shoulder instability score.

In Rowe score stability, motion and function is assessed.¹¹ In Constant score pain, activity, arm

position, strength and range of motion is assessed. Maximum score is 100.¹² Other evaluation parameter was the Oxford shoulder instability score which consists of 12 questions.¹³ The interpretation of all the three is summarized in Table 1.

Table 1: Analysis of Rowe score, Constant Score and oxford shoulder score.

Grade	Rowe score(0-100)	Constant score(0-100)	Oxford shoulder instability score(0-48)
Excellent	100-90	100-90	48-40
Good	89-75	89-80	39-30
Fair	74-51	79-70	29-20
Poor	<50	<70	<20



Figure 1: Pre-op Radiographs



Figure 2: Pre-op plain Radiograph



Figure 3: Post- Op Radiograph

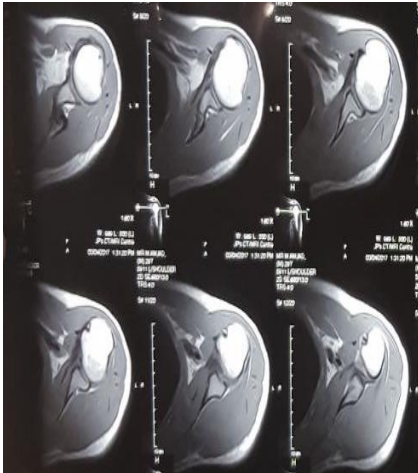


Figure 4: Pre-Op MRI shoulder



Figure 5: Per-op Arthroscopic Bankart lesion



Figure 6: Per-op Arthroscopic Bankart lesion and suture anchor

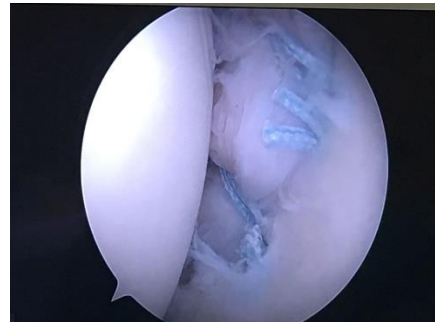


Figure 7: Per-op Arthroscopic picture after Repair



Figure 8: Post-op forward elevation



Figure 9: post op external rotation



Figure 10: Post op internal rotation



Figure 11: Post op adduction

OPERATIVE PROCEDURE

All stabilizations were performed in a standard way by two senior surgeons under general anesthesia recently described by Antunes JP et al(14). Patient to be operated was placed in beach chair position. Direction of instability was assessed. Anterior and posterior drawer test was done. All bony landmarks were marked and skin was prepared in standard sterile manner. A portal from posterior acromion was used. About 10cc of 2% lignocain was injected and needle detached from syringe to look for back flow of fluid from the joint which confirm that needle is in the joint. Additional benefit of this was reduced post operative pain. After passing posterior port diagnostic arthroscopy was performed.. Only two ports were used from anterior side. The rotator interval was used for the anterosuperior portal. Capsule and labrum was mobilized. A rasper was used to abrade glenoid edge at appropriate places. At 5 O'clock position fist suture anchor was placed and anterior glenoid labrum and inferior glenohumeral ligament was shifted and advanced superiorly. Another suture anchor was placed at 3 o'clock position and 3rd at 1 o'clock position. During surgery arm was kept in 10⁰ external rotation and abduction in order to avoid post operative limitation in external rotation. Residual capsular laxity

was treated by tightening of rotator interval and soft tissue over subscapularis and supraspinatus was stitched together.

Postoperatively sling was used to immobilize shoulder joint for three weeks. In next three weeks pendulum movement and passive motion initiated. At 6th week active of motion was advised under supervision of physiotherapist. After 9 weeks external rotation was started. At 16 weeks all activities were allowed except contact sports. Sports were allowed after 9 months.

Data was analysed with SPSS vesion. 21.0. Frequency, Mean and SD was calculated for age, Rowe score and other important variables.

RESULTS

There were 95% (57) male and 5% (3) female. 66.7% (40) and 33.3% (20) involved side right and left respectively. The dominant side was affected in 70 % (42) and non dominant in 30% (18). At the time of operation the mean age was 41.35±13.86 years (range 17-78). All patients were followed for minimum one year and mean follow up was 18.25 ±3.5 (range 11-22) months. There was no neurovascular deficit preoperatively. There were 78.3%, 5%, 16.7% cases of Bankart, hill Sachs and SLAP lesion diagnosed preoperatively with MRI and during diagnostic arthroscopy. (Table 2)

The mean Rowe score at final visit was 92.48 ±6.5 and 88.3% (53), 8.3% (5), 3.3% (2) belong to excellent, good and fair group respectively. Mean Oxford shoulder instability score was 43.03±5.99 and 83.4% (50), 13.3% (8) and 3.3% (10) belong to excellent, good and fair group respectively. Mean Constant score was 91.7±11.6 and 80% (48), 10% (6), 6.7% (4) and 3.3% (2) belong to excellent, good, fair and poor group respectively. All patients achieved full range of motion. (Table 3)

There were 6 cases of complications. Four patients have moderate pain and stiffness. Two patients develop serous discharge from port site. Pain and stiffness was managed with physiotherapy and NSAIDS. Wound complication was managed with daily dressing and oral antibiotic. All these patient scored fair to poor. There was no case of recurrent shoulder instability. All patients achieved full range of motion.

Table 2. Patient’s demographic profile

Total No of pts	60
Male	57 (95%)

Female	3 (5%)
Military personnel	39 (65%)
civilians	21 (35%)
Right shoulder	40 (66.7%)
Left	20 (33.3%)
Dominant	42 (70%)
Non-dominant	28 (30%)

Bankart lesion	(78.3%)
Hill Sachs lesion	(5%)
SLAP lesion	(16.7%)

Table 3. Functional score of all scores.

Score	Mean	Range	Excellent	Good	Fair	Poor
Rowe score	92.48±6.5	75-100	88.3% (53)	8.3% (5)	3.3% (2)	0
Constant score	91.7±11.6	58-100	80% (48)	10% (6)	6.7% (4)	3.3%(2)
Oxford shoulder instability score	43.03±5.99	27-48	83.4% (50)	13.3% (8)	3.3%(2)	0

DISCUSSION

Recurrent shoulder dislocation is a very disabling condition for athletes and military personal, and trauma being a most common cause among them.¹⁵ In current series we have 100% incidence of traumatic event in our patients either due to fall or during various sports activities. Öf et al. reported 100 % positive traumatic cause in their series.¹⁶ In our series right shoulder involved in 66.7% and left in 33.3% patient. Dominant side is most commonly involved¹⁷ and in our series 70% dominant side was involved. Bankart lesion is most frequently reported cause of anterior shoulder instability which is present in 80 to 90% of cases (16). In our series 78.3%, 5%, 16.7% cases have Bankart, Hill Sachs lesion and SLAP lesions respectively.

During last two decades arthroscopic stabilization is frequently performed as compared to open Bankart surgery which accounts for only 10% of all shoulder stabilizing procedures (8). As mentioned in previous reports, there are chances of recurrent post operative instability after arthroscopic Bankart surgery. Mishra in their retrospective series 65 cases also reported no post operative dislocation but 3 cases reported subluxation.¹⁸ Castagna A treated 42 patients in their series and reported 22.5% recurrence in his report.¹⁹ Plath also has 6.6% case of recurrent post operative instability.²⁰ In contrast we have no case of recurrence in our series. This may be because of short duration of follow up as minimum of 4.2 years are required for post operative instability to develop after arthroscopic shoulder Bankart surgery.²¹

Arthroscopic Bankart surgery is associated with better range of motion. In our series all patients achieved full range of motion. This is because of short duration of immobilization and supervised

rehabilitation by physiotherapist and self motivation of our patients to achieve pre injury status. In some reports shows loss of external rotation. Erkoçak¹⁶ reported Loss of external rotation was 5%. Castagna¹⁹ reported 15% loss of external rotation in 16.1% cases in their study. Plath also reported some restriction of mobility after arthroscopic repair.²⁰

We evaluated our patients functionally with constant score, Oxford Shoulder Instability Score and Rowe Score. The Rowe score was 92.48 ±6.5SD and 88.3% (53), 8.3% (5), 3.3% (2) belonged to excellent, good and fair groups respectively at final follow up visit. Mean Constant score was 91.7±11.6 and 80% (48), 10% (6) 6.7% (4) and 3.3% (2) were placed in excellent, good, fair and poor groups respectively. Erkoçak¹⁶ reported mean Rowe score, of 75.7%, 14.6%, 7.3% and 2.4% outcomes in excellent, good, fair and poor group respectively Castagna¹⁹ reported Mean Rowe score 80.1 (range, 30-100) and 58%, 19.3%, 3.3%, 19.4% outcomes in excellent, good, fair, and poor groups.

In our series we had Mean Oxford shoulder instability score 43.03±5.99 and 83.4% (50), 13.3% (8) and 3.3% (10) belonged to excellent, good and fair group respectively. Kalkar²² in their retrospective series of 22 cases had mean Rowe score of 95.45 (range 25-100), 95.4% (22) and 4.6% (1) patients were in excellent and poor group respectively. Mean Oxford shoulder instability score was 44.63 (32-48) and majority (20 patients) of them had excellent functional outcome.

Our research study sample was small and we had a shorter follow up period. Strong point of our series is standardized technique performed by the same surgeons.

CONCLUSION

Bankart arthroscopic stabilization with anchor sutures is a safe and useful procedure with excellent results and less morbidity as compared to open procedure. We strongly recommend it for post traumatic unidirectional instability of shoulder joint.

REFERENCES

1. Canale ST, Beaty JH. Campbell's Operative Orthopaedics 2012;2271-95.
2. Pavic R, Margetic P, Bernadic RL. Diagnostic value of US, MR and MR arthrography in shoulder instability. *Injury* 2013;44:26-32.
3. Kraeutler MJ, Aberle NS, Brown CC, Ptasiński JJ, McCarty EC. Clinical outcome and return to sport after Arthroscopic Anterior, Posterior and combined shoulder stabilization. *Orthop J Sports Med* 2018;6(4):232-239.
4. Zarezada A, Dehghani M, Rozati AR, Banadaki HS, Shekarchizade N. Comparison of Bristow procedure and Bankart Arthroscopic method as the treatment of recurrent shoulder instability. *Advanced Biomedical Research* 2014;3:256-260.
5. Balg F, Boileau P. The Instability Severity Index Score: A simple pre operative score to select patients for arthroscopic or open shoulder stabilization. *J Bone Joint Surg [Br]* 2007;89(11):1470-7.
6. Vavken P, Sadoghi P, Quidde J, Lucas R, Delaney R, Muller AM et al. Immobilization in internal or external rotation does not change recurrence rates after traumatic anterior shoulder dislocation. *Journal of Shoulder and Elbow Surgery* 2014;23(1):13-9.
7. Barlow JD, Grosel T, Higgins J, Everhart JS, Magnussen RA. Surgical treatment outcomes after Primary vs Recurrent anterior shoulder instability. *Journal of Clinical Orthopaedics and Trauma* 2018;65-70.
8. Kowalski TJ, Khan AZ, Cohen JR, Lord EL, Ishmael C, Soohoo NF et al. Open shoulder stabilization: Current trends and 1 year post operative complication. *JSES Open Access* 2011;1(2):72-8.
9. Kramer JD, Robinson S, Hohn E, Purviance C, Wolf EM. Fixation methods and implants in shoulder stabilization: A historical perspective 2018;15(2):630-5.
10. Karataglis D, Agathangelidis F. Long term outcome of Arthroscopic shoulder instability surgery. *The Open Orthopaedic Journal* 2017;11:133-138.
11. Skare, Schroder CP, Mowinckel P, Reikeras O, Brox JI. Reliability, Agreement and Validity of the 1988 version of Rowe score. *Journal of Shoulder and Elbow Surgery* 2011;20(7):1041-9.
12. Constant CR, Gerber C, Emery RJ, Sojbjerg JO, Gohlke F, Boileau P. A review of the Constant Score: Modification and guidelines for its use. *Journal of Shoulder and Elbow Surgery* 2008;17(2):355-61.
13. Rouleau DM, Faber K, MacDermid JC. Systemic Review of patient-administered shoulder functional scores on instability. *Journal of Shoulder and Elbow Surgery* 2010;19(8):1121-8.
14. Antunes JP, Mendes A, Prado MH, Moro OP, Mirol RL. Arthroscopic Bankart repair for recurrent shoulder instability: A Retrospective study of 86 cases. *J Orthop* 2016;13(2):95-9.
15. Amako M, Arino H, Tsuda Y, Tsuchihara T, Nemoto K. Recovery of shoulder rotational muscle strength after arthroscopic Bankart repair. *Orthop J Sports Med* 2017;5(9):232-235.
16. Erkokcak OF, Yel M. The functional results of Arthroscopic Bankart repair with knotless Anchors for anterior Glenohumeral instability. *European Journal of General Medicine* 2010;7(2):25-30.
17. Aydin A, Usta M, Topal M, Umur EY, Truncer K, Karsan O. Comparison of open Bankart Versus Modified Bristow operation for the treatment of traumatic recurrent anterior dislocation and capsular laxity of the shoulder. *The Eurasian Journal of Medicine* 2012;44(3):157-62.
18. Mishra A, Sharma P, Chaudhary D. Analysis of the functional results of arthroscopic Bankart repair in posttraumatic recurrent anterior dislocation of shoulder. *Indian Journal of Orthopaedics* 2012;46(6):668-74.
19. Castagna A, Markopoulos N, Conti M, Delle-Rose G, Papadakou E, Garofalo R. Arthroscopic Bankart suture anchor repair: Radiological and clinical outcome at minimum 10 years follow up. *The American Journal of Sports Medicine* 2010;38(10):212-6.
20. Plath JE, Feucht MJ, Bangoj R, Martestschlager F, Wortler K, Seppel G et al. Arthroscopic suture anchor fixation of bony Bankart lesions: Clinical outcome, Magnetic Resonance Imaging Results and

- return to sports. The Journal of Arthroscopy & Related Surgery 2015;31(8):1472-81.
21. Tordjman D,Vidal C,Fontes D.Mid term results of arthroscopic Bankart repair:A review of 31 cases.Orthopaedics & Traumatology:Surgery & Research 3016;102(5):541-8.
22. Kalkar I,Esenyel CZ,Saygili MS,Esenyel A,Gurbuz H.The results of Bankart repair without capsular plication in patients with recurrent traumatic shoulder dislocation. Journal of Orthopaedic Surgery(Hong Kong) 2017;25(1):23-28.

Authorship and contribution Declaration

Latif Khan, Conception and design,

Col. Khalid Masood, interpreted the data

Kamran Butt, Drafted the manuscript

Khalid Zulfiqar Qureshi, The manuscript was revised critically for essential intellectual content.

Muhammad Kashif Shafi, Approval of the manuscript for publication

Belal Saadat, acquisition of data

Karam Rasool Basra, Drafted the manuscript