

## Results of Open Capsular Shift Procedure for Recurrent Anterior shoulder Instability in Young Patients

Ullah S<sup>1</sup>, Haleem W<sup>2</sup>, Waqar M<sup>3</sup>, Khan Z<sup>4</sup>, Ahmad I<sup>5\*</sup> and Khan MA<sup>6</sup>

<sup>1</sup>Department of orthopedic and spine surgery Hayatabad medical complex Peshawar, Pakistan

<sup>2</sup>Department of orthopedic and spine surgery Hayatabad Medical Complex Peshawar, Pakistan

<sup>3</sup>Department of orthopedic and spine surgery Hayatabad Medical Complex Peshawar, Pakistan

<sup>4</sup>Department of orthopedic and spine surgery Hayatabad Medical Complex Peshawar, Pakistan

<sup>5</sup>Department of orthopedic and spine surgery hayatabad medical complex, Khyber Girls Medical College Peshawar, Pakistan

<sup>6</sup>Head department of orthopedic and spine surgery hayatabad medical complex, Khyber Girls Medical College Peshawar, Pakistan

### \*Corresponding author:

Israr Ahmad.  
(FCPSOrtho) Associate professor, Khyber Girls Medical College, Department of orthopedic and spine surgery hayatabad medical complex Peshawar, Pakistan Cell no. +923005948476; E-mail: israr\_312@yahoo.com

Received: 05 Oct 2021

Accepted: 12 Oct 2021

Published: 17 Oct 2021

### Copyright:

©2021 Ahmad I. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

### Citation:

Ahmad I. Results of Open Capsular Shift Procedure for Recurrent Anterior shoulder Instability in Young Patients. *Ame J Surg Clin Case Rep.* 2021; 3(15): 1-5

### Keywords:

Open Capsular Shift; Recurrent Anterior Shoulder Instability

### 1. Abstract

The aim of this study is to assess the outcomes of open capsular shift procedure, in young patients with posttraumatic recurrent anterior shoulder instability.

#### 1.1. Method

30 patients were included in our study, which had traumatic anterior shoulder dislocation, and resulting recurrent anterior shoulder instability for which they underwent open capsular shift procedure with at least 18 months' follow-up and minimum of 4 months of physiotherapy postoperatively. Recurrent instability, range of motion, patient satisfaction, and post-surgical complications were evaluated.

#### 1.2. Results

One patient out of 30 had recurrent shoulder instability while one patient had positive apprehension test post operatively. The average loss of external rotation and shoulder flexion was 19 degrees and 45 degrees respectively. The overall satisfaction rate was 76% with ASES, SST and Rowe scores of 82%, 9% and 79% respectively. One patient (3.12%) had wound infection.

#### 1.3. Conclusion

Open capsular shift procedure for recurrent shoulder instability followed by physiotherapy has favorable outcome in terms of low

recurrent instability rate, low post-surgical complication rate, high patient satisfaction, ability to joint work back and improved shoulder range of motion.

### 2. Introduction

In case of shoulder joint stability is sacrificed over mobility. In a healthy shoulder the humeral head is maintained in the glenoid fossa by structures such as muscles and ligaments around the glenohumeral joint. If these structures (muscle or ligaments) get injured by trauma, it gives rise to shoulder instability. Traumatic instability is more common in young active patients with high recurrence rate. Among the different types of this joint instability, the anterior dislocation due to trauma is the most common type, corresponding to more than 90% of the cases [1,3]. Instability has a negative effect on the functionality of the shoulder.

Shoulder instability can be unidirectional (Anterior or posterior) or multidirectional. Ninety percent (90%) of shoulder dislocations are anterior because joint capsule is weakest in front of shoulder, and traumatic injuries account for 95% of them [4,7]. Among patients aged 20 to 25 years, the recurrence rate is between 50 and 75%. Hovelius et al found that after a single traumatic episode of anterior instability, 57% of patients <40 years of age suffered at least 1 recurrent episode, whereas 27% of patients ultimately required an operative procedure to address recurrent instability.

Other studies have found a substantial risk of recurrent instability after a first-time dislocation, especially in the young, active population [5,8,10]. Operative management of recurrent shoulder instability has shown an improvement in patient outcomes compared with nonoperative treatment [8,11]. These surgeries include both arthroscopic and open surgical repairs [11]. Open repair remained the mainstay of treatment until it was shown in the early 2000s that arthroscopic repair showed equivalent efficacy with less morbidity [12]. Although arthroscopic stabilization is the preferred surgical management of anterior instability for most shoulders without critical bone loss, some outcome studies have found recurrence rates ranging from 16% to 26% after arthroscopic repair, a suboptimal failure rate [13,17].

In term of diagnosis, a complete history and physical examination (coupled with specific tests) comes first. X-ray is usually ordered to rule out fracture as cause of shoulder pain. CT arthrogram has been used to demonstrate bone and soft tissue around glenohumeral joint. CT scan can also show fracture around the glenoid. MRI is superior in detecting capsuloligamentous injury plus bony fracture around the shoulder joint.

Open capsular shift was proposed by Neer and Foster [18] as a treatment for shoulder instability. This procedure is aim to recreate tension in ligaments around the shoulder joint by reducing capsular size. Resizing the capsule, decreases capsular volume with increase shoulder response to downward loading.

### 3. Methods

We retrospectively reviewed our sports clinic record and recruited 30 patients (30 shoulders) who underwent open capsular shift between July 2018 and Dec 2020 with minimum follow up for 18 months. All the surgeries were performed by a trained orthopedic and sports surgeon and the patients were followed by one orthopedic resident. All the included patients had age between 19 to 30 years. We had selected those patients having less than 10 episodes of shoulder dislocations and had non-engaging hill sach lesion on MRI. X rays, MRI were in favor of non-engaging HillSach lesion and per of 90/90 (90 degrees abduction and 90 degrees external rotation test) was tried for diagnosing engaging vs. non engaging Hill Sach lesion. These patients had history of sport or non-sport related trauma to shoulder with resulting shoulder instability. All the patients who underwent open capsular shift procedure had an active life style, with no vascular or neurological deficit, who were ready to participate in research study and willing to be contacted on mobile phone, had no co-morbidities and must be fit for general anesthesia and surgery and who must have gone through complete sessions (4 months at least) physiotherapy and rehabilitation postoperatively were included while patients with atraumatic shoulder dislocation or multidirectional shoulder instability, with glenoid bone loss more than 25% evident on preoperative Computerized

Tomography Scan (CT scan), having associated Rotator cuff tear, engaging Hill-Sachs lesion, whom chief complaint was pain with shoulder movement under load rather than instability were excluded from the study.

All the surgeries were performed by a single surgeon using same open capsular shift procedure in all the patients. After general anesthesia, while the patient in supine position the effected shoulder was examined for anterior, posterior, inferior or multidirectional instability and range of motion was evaluated.

#### 3.1. Surgical Procedure

In all the 30 patients, deltopectoral approach was used for surgical exposure. Dissection is done superiorly up to coracoid process where cephalic vein is identified, deltoid is separated from pectoralis and vein is taken with the deltoid laterally. Axillary nerve is identified and secured in inferior aspect of the exposure. We put our retractor above the subscapularis, under the coracoacromial ligament and short flexes coming off the coracoid is identified and retracted exposing the subscapularis and anterior aspect of shoulder, by putting finger axillary nerve is palpated and secured. Biceps tendon is identified which serves as landmark to determine the extent of dissection to separate subscapularis and capsule. Tunneling under the subscapularis with scissors is done, bringing out the interval, stay sutures secured in subscapularis for retraction. Subscapularis is dissected down along the edges of scissors exposing the capsule. Stay sutures in capsule are taken. Capsule incised down to level of glenoid approximately in the middle of capsule to create a robust inferior capsular tissue that we are going to transplant superiorly. Humerus is flexed and rotated externally and around the humerus head capsule is incised, extending posteriorly as far as needed depending on degree on instability. The inferior capsular flap is pulled superiorly and fixed to lateral capsular flap with 2.0 non-absorbable suture while the humerus is abducted and externally rotated 45 degrees and 10 degrees respectively. Now the superior flap is pulled laterally and inferiorly and sutured with the inferior flap while the arm is in adducted. The subscapularis muscle is sutured back in anatomical manner and so the deltoid and pectoralis. Subcutaneous tissue is closed with absorbable 2.0 suture and skin with 2.0 non-absorbable suture.

#### 3.2. Postoperative Rehabilitation

Postoperatively, the operated arm is placed in polysling and abduction pillow for a period of 6 weeks. Active range of motion at elbow, wrist and hand is encouraged while external rotation and shoulder elevation is avoided as followed by Carlson Strother CR et.al19. On the 10th post-op day patient's wounds are examined and stitched are taken out. Patients are regularly followed for 3rd, 4th, and then 6th week postoperatively and after 6 weeks they were subjected to physiotherapy. All the patients were followed for minimum of 2 years postoperatively and regularly evaluated.

**4. Outcome Measures**

In the follow up period after surgery the patients were assessed for recurrent instability, range of motion, patient satisfaction, and post-surgical complications

**5. Results**

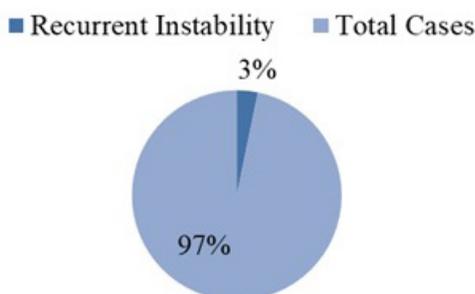
Postoperative recurrent anterior instability was reported in 1 case out of 30 patients (3.3%) who had experienced second episode of trauma to the operated shoulder with complete dislocation on 16th month of index surgery. In 12 patients out of 30 (40%) the average loss of external rotation was 19 degree (range 6-56.5). Out of these 12 patients 2 (6.6%) had improvement in range of external rotation of average 10 degree (range 6-14) with subsequent sessions of physiotherapy. In 6 patients (20%) painful arc was present pre-operatively which was absent postoperatively. 10 patients (33.3%) had operated shoulder active range of motion equal to opposite shoulder (180 degree). 3 patients (10%) had loss of flexion between 10 and 80 degrees (mean 45 degree).

The overall patient satisfaction rate was 76%, the mean ASES score was 82% with 80% excellent and good scores. The mean Rowe score was 79% with 76% excellent and good scores. Mean SST was 9%.

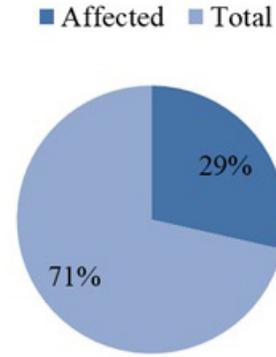
1 patient (3.3%) had developed superficial wound infection that resolved after a course of oral antibiotics.



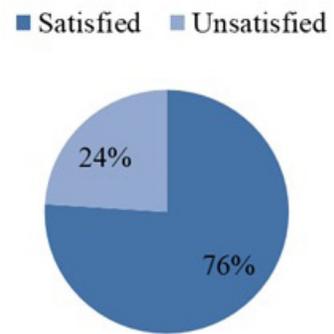
**Fig. II Recurrent Anterior Instability**



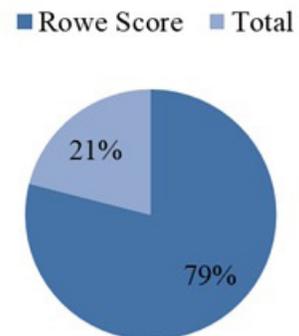
**Fig.III. Loss of External Rotation**



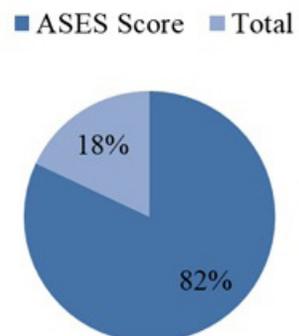
**Fig.IV. Satisfaction Rate**



**Fig. V. ROWE Score**



**Fig.VI. ASES Score**



## 6. Discussion

With the advent of arthroscopy and arthroscopic techniques all of us have benefited from the increase in technology and the advances that have allowed us to treat such shoulder pathologies as rotator cuff and instability procedures arthroscopically. But some outcome studies have found recurrence rates ranging from 16% to 26% after arthroscopic repair, a suboptimal failure rate [13,17].

Our study mainly focuses on outcome and complications linked with open capsular shift for recurrent anterior shoulder instability. Our study found that among total 30 participants, only 3 patients had recurrent anterior instability. Among these 3, 2 patients had recurrent trauma leading to complete dislocation while remaining 1 had episodes of dislocation on 12th, 15th and 20th month after surgery. 12 patients out of 30 had an average loss of 19 degree of external rotation in operated shoulder compared to contralateral healthy shoulder, with subsequent physiotherapy session 2 out of these 12 patient had improvement in external rotation of an average of 10 degree and 1 patient had wound infection. The mean post-surgical score of ASES was 76%. The mean score of post-surgical instability measured with ROWE was 79%. Mean score of simple shoulder test for functional limitation was 9%.

In a previous study from our department in 2015 the results of modified Putti Platt procedure had yielded similar results. The Rowe score was above 74 in 86% of patients despite no structured physiotherapy programme in those times. Although the loss of motion was more in that study [20].

As discussed by Carlson Strother CR. et al [19] in his study, he reported the recurrent instability rate of 2% to 8% which is supported by our study. On the other hand, the overall satisfaction rate in our study was 76% while the study performed by aforementioned author the overall satisfaction rate was 81-97%. The difference in satisfaction rate may be due to difference in population.

## 7. Conclusion

Open capsular shift procedure for recurrent anterior shoulder instability followed by physiotherapy has excellent short term outcome in term of low post-surgical complication rate, high patient satisfaction, improved shoulder range of motion and improved subjective scores, although further studies are needed to evaluate its effectiveness and efficacy in long term.

## References

1. Romeo AA, Cohen BS, Carreira DS. Traumatic anterior shoulder instability. *Orthop Clin North Am* ; 32(3): 399-409.
2. Maffulli N, Longo UG, Gougoulias N, Loppini M, Denaro V. Long-term health outcomes of youth sports injuries. *Br J Sports Med.* 2010; 44: 21-5.
3. Anterior Glenohumeral Instability | Orthopedic. [cited 2021 Mar 21].
4. Hovelius L. Anterior dislocation of the shoulder in teen-agers and young adults. Five-year prognosis. *J Bone Jt Surg Am.* 1987; 69: 393-9.
5. Hovelius L, Augustini BG, Fredin H, Johansson O, Norlin R, Thorling J. Primary Anterior Dislocation of the Shoulder in Young Patients. A ten-year prospective study. *J Bone Joint Surg Am.* 1996; 78: 1677-84.
6. Hovelius L. Shoulder dislocation in Swedish ice hockey players. *Am J Sports Med.* 1978; 6: 373-7.
7. Henry JH, Genung JA. Natural history of glenohumeral dislocation—revisited. *Am J Sports Med.* 1982; 10:135-7.
8. Zaremski JL, Galloza J, Sepulveda F, Vasilopoulos T, Micheo W, Herman DC. Recurrence and return to play after shoulder instability events in young and adolescent athletes: A systematic review and meta-analysis. *Br J Sports Med.* 2017; 51: 177-184.
9. Hovelius L, Olofsson A, Sandström B, Augustini B-G, Krantz L, Fredin H, et al. Nonoperative Treatment of Primary Anterior Shoulder Dislocation in Patients Forty Years of Age and Younger. *J Bone Jt Surger Am.* 2008; 90: 945-52.
10. Rugg C, Hettrich C, Ortiz S, Wolf BR, Zhang AL. Surgical stabilization for first-time shoulder dislocators: a multicenter analysis. *J Shoulder Elbow Surg.* 2018; 27: 674-685.
11. Brophy RH, Marx RG. The treatment of traumatic anterior instability of the shoulder: nonoperative and surgical treatment. *Arthroscopy.* 2009; 25: 298-304.
12. Levy DM, Cole BJ, Bach BR. History of surgical intervention of anterior shoulder instability. *J Shoulder Elbow Surg.* 2016; 25: e139-50.
13. Virk MS, Manzo RL, Cote M, Ware JK, Mazzocca AD, Nissen CW, et al. Comparison of Time to Recurrence of Instability After Open and Arthroscopic Bankart Repair Techniques. *Orthop J Sport Med.* 2016; 4: 2325967116654114.
14. Clesham K, Shannon FJ. Arthroscopic anterior shoulder stabilization in overhead sport athletes: 5-year follow-up. *Ir J Med Sci.* 2019; 188: 1233-7.
15. Chan AG, Kilcoyne KG, Chan S, Dickens JF, Waterman BR. Evaluation of the Instability Severity Index score in predicting failure following arthroscopic Bankart surgery in an active military population. *J Shoulder Elb Surg.* 2019; 28: e156-63.
16. Lee SH, Lim KH, Kim JW. Risk Factors for Recurrence of Anterior-Inferior Instability of the Shoulder After Arthroscopic Bankart Repair in Patients Younger Than 30 Years. *Arthroscopy.* 2018; 34(9): 2530-6.
17. Yong GR, Jeong HH, Nam SC. Anterior shoulder stabilization in collision athletes: Arthroscopic versus open bankart repair. *Am J Sports Med.* 2006; 34: 979-85.
18. Charalambous CP, Eastwood S. Inferior capsular shift for involuntary inferior and multidirectional instability of the shoulder. A preliminary report. *J Bone Joint Surg Am.* 1980; 62: 897-908.

19. Carlson Strother CR, McLaughlin RJ, Krych AJ, Sanchez-Sotelo J, Camp CL. Open Shoulder Stabilization for Instability: Anterior Labral Repair With Capsular Shift. *Arthrosc Tech.* 2019; 8: e749-54.
20. Ahmad I, Waheed D, Rafiq M, Sanallah, Khan MZ, Hakim H, Khan MA. Outcome of modified Putti Platt procedure for recurrent anterior shoulder dislocation. *Pak J Surg* 2015;31(2):133-36