

Open versus arthroscopic surgical management for recurrent anterior instability of the shoulder: A prospective Study

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Abstract

Background: The best surgical treatment for recurrent anterior shoulder instability is still up for debate. We didn't know much about the advantages and disadvantages of old open and newer arthroscopic methods. We expected that regardless of surgical approach, all patients' results would be identical. **Material and Methods:** This is a comparative study, Prospective and cross-sectional study conducted at Department of Orthopaedics, Tertiary care Teaching Hospital over a period of 1 year. According to the surgical management, they were divided into two groups: Group A Patients had either open surgery with suture anchors and capsular shift. Group B Arthroscopic Surgery Suture anchors and suture capsulorrhaphy are used. **Result:** In our study, time of surgery was significantly longer in the arthroscopic surgery group than the open surgery group ($P < 0.05$). Intraoperative blood loss was significantly more in the open surgery group than the arthroscopic surgery group ($P < 0.0001$) and total time of hospital stay was significantly more in the open surgery than the arthroscopic surgery group ($P < 0.05$). VAS pain scores after the surgery was significantly higher in the open surgery group than the arthroscopic surgery group ($P > 0.05$). Increase in Rowe score after the surgery was significantly higher in the open surgery group than the arthroscopic surgery group. **Conclusion:** Recurrent anterior shoulder instability may be safely treated with arthroscopic stabilisation. Range of motion is marginally better following arthroscopic treatment when compared with open repair. Although open surgery is more intrusive than arthroscopic Bankart surgery, it should still be considered for certain patients because of its impact on shoulder joint long-term stability.

Keywords: Open surgery, Recurrent anterior shoulder instability, Arthroscopic.

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Introduction

Anterior shoulder instability describes a condition in which the humeral head subluxes or dislocates from the glenoid fossa due to a soft tissue or bone trauma[1]. It's a glenohumeral joint (GHJ) injury in which the humerus is displaced from its usual location in the glenoid fossa and the joint surfaces are no longer in contact[2]. One of most complicated joints in the body is the GHJ (multi-axial spheroidal joint). It has the widest range of motion of any joint, yet this makes it the most unstable and prone to dislocation of all the joints in the body[3].

A number of studies have evaluated the outcomes of arthroscopic versus open shoulder instability repair[4]. Open technique proponents argue that it allows the surgeon to provide a more anatomic and secure repair with improved anchor orientation, whereas arthroscopic technique proponents argue that it avoids the complications associated with open approaches (infection, subscapularis violation, and arthrofibrosis) while providing an equivalent repair with a faster recovery[5].

In the last two decades, arthroscopic stabilisation for recurrent anterior instability has progressed significantly. Staple capsulorrhaphy was used for initial arthroscopic fixation, which led in recurrent instability in 16 percent to 33 percent of patients [6]. Transglenoid suturing and bioabsorbable tack fixing have both been used for arthroscopic stabilisation, however both have a significant failure rate.

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Newer arthroscopic stabilisation procedures, including as suture anchor fixation and capsular plication have been developed and failure rates have decreased[7].

Material and Methods

This is a comparative study, Prospective and cross-sectional study conducted at Department of Orthopaedics, Tertiary care Teaching Hospital over a period of 1 year. According to the surgical management, they were divided into two groups: Group A Patients had either open surgery with suture anchors and capsular shift. Group B Arthroscopic Surgery Suture anchors and suture capsulorrhaphy are used. All of the patients experienced recurring anterior shoulder instability as their primary symptom, as well as dislocation of the shoulder joint when subjected to little external stress. Confirmation of a Bankart lesion (avulsion of the anterior-inferior glenoid labrum) on diagnostic arthroscopy/ Bankart injury was confirmed by MRI analysis were include. A condition other than osteoarthritis of the shoulder (significant changes in joint space), multiple recurrent shoulder subluxations or dislocations, first dislocated, severe epilepsy, unclosed osteoepiphysis, severe glenoid bone loss (glenoid loss of contour on anteroposterior radiograph), an active infection, and a major medical illness were all considered exclusion criteria.

Statistical analysis

Data analysed in Statistical Package for the Social Sciences (SPSS) version 25th was applied. The results expressed as mean, range percentages and using tables as appropriate. Compared between the two groups using unpaired 't' test. For comparison of gender Chi-Square test was used. p value <0.05 indicates Statistically significant.

Results

In our study, the most of the recurrent anterior instability of the shoulder were male in both Groups in table 1.

Table 1: Comparison of gender between two groups by using Chi-Square test

Gender	Group A n (%)	Group B n (%)	p - value
Male	47 (78.3%)	49 (81.6%)	>0.05
Female	13 (21.7%)	11 (18.4%)	
Total	60 (100%)	60 (100%)	

In table 2, maximum number of patients were male in both the groups.

Table 2: Distribution of age groups between two groups

Age in years	Group A n (%)	Group B n (%)
<20	3 (5%)	2 (3.3%)
21-30	5 (8.3%)	5 (8.3%)
31-40	11 (18.3%)	9 (15%)
41-50	13 (21.6%)	14 (23.3%)
51-60	17 (28.3%)	17 (28.3%)
>61	11 (18.3%)	13 (21.6%)
Total	60 (100%)	60 (100%)

In table 2, least patients were in age group of <20 years i.e., 3 (5%) and maximum were 51-60 years 17(28.3%) in Group A (open surgery). In Group B (arthroscopic surgery), minimum patients were observed in < 20 years i.e., 2(3.3%) and more number of patients were 51-60 years 17 (28.3%).

Table 3: Distribution of parameters between two group

Parameters	Group A	Group B	p - value
Time (min.) Mean±SD	71.3±7.38	96.3±8.46	<0.05
Haemorrhage (ml)	142.2±12.5	19.4±6.3	<0.0001
Total hospital stays (days)	9.7±1.6	5.3±1.4	<0.05
Infection (n)	1	0	-
Nerve injury (n)	1	1	-

In table 3, time of surgery was significantly longer in the arthroscopic surgery group than the open surgery group ($P < 0.05$). Intraoperative blood loss was significantly more in the open surgery group than the arthroscopic surgery group ($P < 0.0001$) and total time of hospital stay was significantly more in the open surgery than the arthroscopic surgery group ($P < 0.05$). Total 2 patients were seen in open surgery, complications such as wound infection and nerve injury.

Table 4: VAS pain scores were compared between the two groups

Parameters	Group A	Group B	p - value
Before	8.43±3.43	7.89±3.54	>0.05
After	4.2±0.65	3.3±0.37	>0.05
Last	3.7±0.78	2.8±0.75	>0.05

In table 4, VAS pain scores after the surgery was significantly higher in the open surgery group than the arthroscopic surgery group ($P > 0.05$).

Table 5: Rowe scores were compared between the two groups

Parameters	Group A	Group B	p - value
Before	41.63±4.63	39.65±4.53	>0.05
After	73.43±6.42	61.3±5.75	<0.05

In table 5, Increase in Rowe score after the surgery was significantly higher in the open surgery group than the arthroscopic surgery group ($P < 0.05$).

Table 6: Recurrent dislocation were compared between the two groups

No. of instability events	Group A	Group B	p - value
Dislocations	4	4	-
Subluxations	0	5	-
Total	4	9	<0.05

In Table 6, in the open surgery group, there were 4 postoperative dislocations, on the other hand, in arthroscopic surgery 4 postoperative dislocations and 5 symptomatic subluxations. There was significant difference between the open and arthroscopic groups with respect to the postoperative recurrence of instability ($P < 0.05$).

Discussion

The shoulder is the most usually dislocated and major joint in the body due to its lack of bony constraints and wide range of motion. The most prevalent pattern is anterior-inferior instability of the humeral head, which accounts for approximately 90% of cases[8]. In addition, young individuals with repeated dislocations are more likely to develop moderate to severe arthropathies[9-10]. Because almost half of all anterior shoulder dislocations occur in people between the ages of 15 and 29, surgery therapy is becoming more common to reduce the risk of recurrence and other problems[11]. In our study, arthroscopic surgery was compared to open surgery, the operating time was much shorter. In addition, as compared to open surgery, arthroscopic instability correction results in less blood loss and a shorter hospital stay. According to Mukherjee S reported similar results in their study[12]. In our research, the frequency of surgery-related problems was used to assess the safety of a surgical treatment. In the present investigation, there were variations in the incidence of postoperative wound infection between two groups. After the operation, one patient in the group suffered dysesthesia, which was resolved after six months of postoperative follow-up. In the open surgery group, there were two patients who developed a superficial surgical site infection, which were all treated with antibiotics and dressing changes. Preoperative planning and skilful surgical manipulation might help prevent damage to vascular or neurological tissues. A similar result was noticed by Gaurav M in his study[13]. Moreover, we found evidence that arthroscopic approaches resulted in better Rowe scores. This was the case for both arthroscopic procedures done with suture anchors and those done with bioabsorbable tacks. As half of the Rowe score is determined by stability, differences were likely due to higher scores for function and motion (which account for the other half of the score) after arthroscopic repair. Although arthroscopic approaches resulted in better Rowe scores, they were not as good as open approaches in enabling patients to return to work or sports.

In our study, the open surgery group, there were 4 postoperative dislocations, on the other hand, in arthroscopic surgery 4 postoperative dislocations and 5 symptomatic subluxations. There was significant difference between the open and arthroscopic groups with respect to the postoperative recurrence of instability. Two previous meta-analyses also demonstrated that instability is more likely to recur following arthroscopic repairs[14,15]. In a systematic review of six studies, Freedman et al. found that the odds of recurrent dislocation were 2.3 times greater after an arthroscopic technique[16].

Conclusion

Recurrent anterior shoulder instability may be safely treated with arthroscopic stabilisation; the clinical outcomes are comparable to those after traditional open stabilization. Range of motion is marginally better following arthroscopic treatment when compared with open repair. Although open surgery is more intrusive than arthroscopic Bankart surgery, it should still be considered for certain patients because of its impact on shoulder joint long-term stability.

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