e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(2); 1214-1217

Original Research Article

A Retrospective Comparative Study of Arthroscopic Versus Open Surgical Treatment for Recurrent Anterior Instability of the Shoulder

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Received: 25-11-2023 / Revised: 23-12-2023 / Accepted: 26-01-2024
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Conflict of interest: Nil

Abstract:

Introduction: Recurrent anterior shoulder instability is a common orthopedic concern, particularly among active individuals. This was treated by Open Bankart procedure but with time and developing technology arthroscopic and less invasive procedures have been developed. In this retrospective study, we delve into the comparative analysis of open Bankart procedure versus arthroscopic procedure for instability in the shoulder, shedding light on the evolving landscape of treatment options for this challenging condition.

Materials and Methods: The investigation was conducted at a tertiary care center. It aimed to compare the outcomes of two distinct surgical approaches: open surgery (Group A) and arthroscopic surgery (Group B) in addressing the condition. A total of 100 patients were taken in the study and divided equally in each group. Both the groups were compared on the basis of pre and post op characteristics and intraoperative responses.

Results: The results revealed that open surgery (Group A) was associated with a significantly shorter surgical duration but required longer hospital stays and led to increased post-operative hemorrhage compared to arthroscopic surgery (Group B), the hospital stay was just 4 days for the Arthroscopic procedure whereas it was 8 days for the Open procedure. Time taken for the Arthroscopic procedure was 96 minutes approximately but for the Open Procedure took 68 minutes.

Conclusion: In conclusion, this study highlights the comparative outcomes of open and arthroscopic surgery for recurrent anterior shoulder instability. Open surgery appears to offer better stability (higher Rowe scores) but with longer hospital stays and increased post-operative hemorrhage. Arthroscopic surgery allows for quicker recovery and shorter hospital stays but requires further evaluation regarding stability. The choice between these approaches should be individualized, considering patient needs and surgical expertise.

Keywords: Recurrent anterior shoulder instability, Open Bankart procedure, Arthroscopic surgery, anterior-inferior glenoid labrum, post-operative outcomes.

Introduction

The shoulder joint is frequently subject to dislocation, making it the most affected joint, showing a prevalence rate of 1.7% as reported in a study [1]. This condition often leads to symptomatic instability, particularly among young and physically active individuals.

Recurrent instability is a common consequence, affecting 40%-95% of patients who experience their first dislocation before the age of 20, and 40% to 74% of patients between the ages of 22-40 [2]. This recurrent instability not only restricts the range of motion of the joint, but also necessitates multiple hospital and emergency department visits for treatment. In many cases, surgical intervention is required to prevent further dislocations [1, 2]. Anterior shoulder instability is a prevalent and troublesome condition, particularly among young and active individuals. The dislocation of the shoulder joint, one of the most affected major joints, reported as 1.7% and often results in symptomatic instability, leading to compromised range of motion and frequent hospital visits [1]. This recurrent instability can necessitate surgical intervention to prevent further dislocations, historically managed through traditional "open Bankart repair" and capsulorrhaphy, which have been considered as the benchmark procedure.

Prior to the arthroscopic treatments, persistent dislocations were repaired by open repair, with only a 4% failure rate [2]. However, recent advances in medical techniques have seen the emergence of arthroscopic stabilization as an alternative approach for addressing this issue. Arthroscopy offers potential advantages, including

reduced hospital stays, diminished postoperative pain, and increased mobility. Much research has mentioned the low recurrence of the dislocation after the Open Bankart stabilization by 1% to 11% [3, 4].

Arthroscopic repairs offer several advantages over open surgery, as highlighted by Green and Christensen [5]. Their study found that surgery performed arthroscopically resulted in reduced loss of blood, decreased need of narcotics, shorter hospital stays, and fewer post op complications.

Arthroscopic stabilization may provide additional benefits such as shorter hospital stays, reduced post-op complications, and increased mobility.

Furthermore, newer techniques, such as "suture anchor fixation" and capsular plication, are designed for arthroscopic procedures [6].

In this prospective study, we delve into the comparative analysis of open procedure and its comparison with arthroscopic surgery for "recurrent anterior instability" of the shoulder, shedding light on the evolving landscape of treatment options for this challenging condition.

Methods and Materials

Study Design and Population

This retrospective study was conducted at a tertiary care center for the time span of 1 year. The surgical management in this study involved categorizing patients in two distinct groups:

- Group A underwent "open suture anchors surgery", or "open capsular shift" were utilized as the primary surgical techniques.
- Group B underwent "Arthroscopic surgery", during which "suture anchors" and "suture capsulorrhaphy" were employed.

Patients in this study presented with recurring anterior shoulder instability as their primary complaint, typically experiencing shoulder joint dislocation even with lowest external pressure. Bankart lesion is characterized by tearing of front-lower portion of the shoulder socket labrum also called "anterior-inferior glenoid labrum", was made through "diagnostic arthroscopy". This injury caused during the Bankart procedure was further confirmed through "magnetic resonance imaging" (MRI).

Inclusion and Exclusion criteria

To maintain the study's focus, patients with conditions other than shoulder osteoarthritis (demonstrating significant joint gap alterations), Chronic shoulder subluxations or dislocations, those who experienced their first dislocation, individuals with severe epilepsy, unclosed osteoepiphysis, substantial glenoid bone loss, active infections, or major medical illnesses were excluded from participation as part of the defined exclusion criteria.

Statistical Analysis: Data obtained was analyzed statistically, expressed as means. Chi square and t test were used for comparing the data.

Results

Both Group A and Group B were analyzed for the gender distribution, Chi square test tool was used to get the results for the gender distribution as given in Table 1 and Table 2. P-value calculated for every group is greater than 0.05 (p value>0.05).

Table 1: Gender Distribution

Gender	Group A	Group B
Male	37 (75.5%)	41 (82.5%)
Female	13 (24.5%)	9 (7.5%)
Total	50	50

Table 2: Age Distribution among group A and B

Age	Group A	Group B
10-20	2	4
21-30	6	8
31-40	9	7
41-50	10	8
51-60	16	13
> = 61	7	10

In Table 2, the age distribution for each group is mentioned above, in Group A representing the patients with open surgery least patients were from the 10-20 years old age group and patients within the age of 51 to 60 were highest whereas, for Group B representing the patients treated with arthroscopic procedure has least patients from (10-20) years group and most from (51-60) age group whereas in Table 1, the percentage of males in both the groups is higher than females.

Table 3: Parameters for the comparison between group A (Open Procedure) and group B (arthroscopic Procedure)

Criteria	Group A	Group B	P-value
Time taken in minutes. SD	68.3 ± 6.9	96.4 ± 9.0	< 0.05
Total stay in hospital (days)	8 ± 11.9	4 ± 8.9	<0.05
Post Op. Infection	1	0	-
Blood Loss (ml)	150 ± 14.3	19.1 ± 4.5	<0.001
VAS score Pre-Op	9.2 ± 2.9	8.4 ± 3.8	>0.05
VAS score Post Op	7.5 ± 0.4	5.8 ± 0.6	>0.05
Final VAS score	4.1 ± 0.2	2.4 ± 0.2	>0.05
Post-Op Dislocation	3	3	-
Symptomatic subluxations	0	3	-
Pre-Op Rowe Score	38.9 ± 4.5	36.6 ± 4.6	>0.05
Post OP Rowe Score	68.8 ± 6.2	61 ± 5.5	<0.05

When both the groups are compared for the given parameters in Table 3, the following is the observation, Group A had a significantly shorter surgical duration compared to Group B method, it was observed that Open surgery presented quite high amount of blood loss during the operation as compared to Arthroscopic procedure. Group A had a longer hospital stay than Group B.

The pre-operative VAS scores were not significantly different between the two groups whereas in post op the visual analog scale score is much higher in Open procedure (Group A). The Rowe score is a clinical scoring system used to evaluate the results of shoulder surgery, particularly in cases of anterior shoulder instability, for Group A the score was significantly higher post-operative compared to Group B. Both groups had the same number of post-operative dislocations and Group B experienced more symptomatic subluxations than Group A.

Discussion

The present study aimed to compare open surgery (Group A) and arthroscopic surgery (Group B) in the context of recurrent anterior shoulder instability. The results and their implications are discussed below, along with a comparison to existing studies in this field.

Patients in both groups exhibited a significant male predominance, with the majority being male. This gender distribution aligns with previous research in the field, suggesting that shoulder instability, often related to sports injuries, is more prevalent in males [7]. The study also reveals significant differences when compared on the basis of surgical techniques, Group A (Open procedure) had a shorter surgical duration compared to Group B (Arthroscopic). This finding aligns with the notion that arthroscopic procedures may require more time due to the technical demands of the method. This was also earlier discussed by other researchers with regards to repair for Recurrent Anterior Shoulder Instability [8, 9]. Arthroscopic procedure as compared to open surgery results in significantly lower levels of blood loss and a shorter hospital stay and intensive care. This difference might be attributed to the less invasive nature of arthroscopic surgery. This was discussed by Mukherjee in his research on techniques and methods used in Arthroscopic procedure [10].

There were differences observed in the occurrence of post-op complications between Group A and Group B. Following the surgical procedure, one patient in group A experienced “dysesthesia”, which was successfully treated in 5 months of post-operative supervision. In the open surgery group, one patient was presented with external surgical area infections, which was effectively managed through the administration of antibiotics and regular dressing changes. Such findings were also mentioned by Gaurav during his research [11]. The VAS scores, measuring pain levels, showed no significant difference between the two groups, both pre- and post-operatively. The post-operative Rowe score was significantly higher in Group A compared to Group B, indicating better functional outcomes after open surgery.

Our results align with some prior studies indicating that open surgery may provide better stability, as evidenced by the higher Rowe scores in Group A [11, 12]. This may be due to the ability of open surgery to offer more extensive tissue repair. However, it's worth noting that this benefit might come at the cost of longer hospital stays and increased post-operative hemorrhage, as observed in this research. In group A (Open surgery), there were three incidences of post-op dislocations.

Conversely, in the arthroscopic surgery group, there were three post-op dislocations and three symptomatic subluxations. A notable difference was observed between the open and arthroscopic groups in terms of the recurrence of instability after surgery. This finding aligns with the results of two previous meta-analyses, which also indicated a higher likelihood of instability recurrence following arthroscopic repairs [12, 13].

Conclusion

This study provides valuable insights into the comparative outcomes of open and arthroscopic surgical management for recurrent anterior shoulder instability.

Our results suggest that open surgery may offer advantages in terms of shoulder stability, as indicated by higher Rowe scores, but at the expense of longer hospital stays and increased post-operative hemorrhage. In contrast, arthroscopic surgery offers quicker recovery and shorter hospital stays but may require further evaluation regarding stability outcomes.

The choice between these surgical approaches should be made on a case-by-case basis, considering individual patient needs, preferences, and the expertise of the surgical team. Further research is warranted to explore long-term outcomes and the impact of these procedures on the living condition for patients with recurrent anterior shoulder instability.

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