

Open Versus Arthroscopic Surgical Management for Recurrent Anterior instability of the Shoulder: A Retrospective Analysis

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Conflict of interest: Nil

Abstract:

Background: Recurrent anterior instability of shoulder is a prevalent condition, especially among athletes, often requiring surgical intervention. Two main surgical approaches, open and arthroscopic, are commonly employed to address this issue.

Aim: This study seeks to evaluate the clinical outcomes of open versus arthroscopic surgical techniques for treating recurrent anterior shoulder instability.

Methods: A retrospective comparative study was led which included 50 patients with recurrent anterior instability of shoulder, divided equally between those undergoing arthroscopic and open surgeries. Inclusion criteria encompassed confirmed instability and no prior shoulder surgeries, while exclusion criteria included multidirectional instability and significant comorbidities. Data were gathered from medical records and follow-up visits, emphasizing the Modified Rowe score, ASES score, range of motion, recurrence rates, and patient satisfaction.

Results: The research found that arthroscopic surgery resulted in higher Rowe and ASES scores, indicating better shoulder function and range of motion, compared to open surgery. However, open surgery demonstrated lower recurrence rates, suggesting greater stability. Patient satisfaction was slightly higher for arthroscopic procedures. Both methods are effective, with arthroscopic surgery offering quicker recovery and less postoperative pain, while open surgery provides more robust long-term stability.

Conclusion: Both surgical methods effectively manage recurrent anterior shoulder instability, but they have distinct advantages. Arthroscopic surgery offers benefits such as less invasive procedures and quicker recovery, while open surgery provides more robust stability with lower recurrence rates.

Recommendations: Further large-scale, long-term researches are recommended to confirm these conclusions and optimize surgical approaches for different patient populations.

Keywords: Anterior Shoulder Instability, Arthroscopic Surgery, Open Surgery, Capsulolabral Repair, Latarjet Procedure.

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Introduction

Recurrent anterior instability of shoulder, a condition commonly encountered in orthopedic practice, often requires surgical intervention for effective management. This condition predominantly affects young, active individuals, including athletes, and can lead to significant functional impairment and reduced quality of life. Surgical techniques have evolved over the years, with two primary approaches being open and arthroscopic surgeries. Both methods aim to restore stability and functionality to the shoulder joint, but they differ in their procedural aspects, recovery times, and outcomes [1].

The advent of arthroscopic techniques has revolutionized shoulder surgery, offering less invasive

options compared to traditional open surgeries. Arthroscopic repairs are associated with smaller incisions, reduced postoperative pain, and quicker recovery times, making them an attractive option for both patients and surgeons. However, concerns remain regarding the long-term stability and recurrence rates associated with arthroscopic procedures. Studies have indicated a higher risk of recurring instability with arthroscopic techniques when compared to open repairs, particularly in risky populations such as athletes [2].

Open surgical techniques, such as the Latarjet procedure, have been the gold standard for treating recurrent anterior shoulder instability, especially in cases with noteworthy bone loss. These procedures

are known for their robust outcomes in terms of stability and lower recurrence rates. Despite being more invasive, leading to longer recovery times and greater postoperative discomfort, the effectiveness of open techniques in preventing recurrent dislocations has been well-documented. Comparative studies have shown that open surgeries might offer superior stability compared to arthroscopic methods, although advancements in arthroscopic techniques are narrowing this gap [3].

The goal of this study is to compare the clinical outcomes of open versus arthroscopic surgical methods for managing recurrent anterior shoulder instability. It aims to assess the differences in effectiveness, including range of motion, failure rates, recurrence, and pain between the two techniques.

Methodology

Study Design: A retrospective comparative study was conducted.

Study Setting: The study was carried out at Darbhanga Medical College, Darbhanga.

Participants: Fifty patients diagnosed with recurrent anterior shoulder instability who underwent surgical intervention were included in the study. Twenty five patients underwent arthroscopic repair, and Twenty five underwent open surgery between 2020 and 2021.

Inclusion Criteria: Patients with recurrent anterior shoulder instability, confirmed by clinical examination and imaging, who underwent either open or arthroscopic surgery.

Exclusion Criteria: Patients with multidirectional instability, previous shoulder surgery, significant comorbidities affecting rehabilitation, or incomplete medical records were excluded from the study.

Bias: Selection bias was minimized by consecutively including patients who met the inclusion criteria. Standardized data collection methods were employed to reduce information bias.

Variables: Primary variables included the Modified Rowe score, ASES score, and Goniometer measurements for range of motion. Secondary variables included recurrence rates, pain levels, and patient satisfaction.

Data Collection: Data were retrospectively gathered from patient medical records, encompassing demographic details, surgical information, and clinical outcomes. Postoperative follow-up data were

acquired through clinic visits and patient interviews.

Procedure

Patients underwent either arthroscopic capsulolabral repair or open Latarjet procedure built on the preference of surgeon and specific patient characteristics. All procedures were performed by experienced orthopedic surgeons. Postoperative rehabilitation protocols were standardized across both groups.

Statistical Analysis: Data were analyzed using SPSS version 21.0. Descriptive statistics were used to summarize patient demographics and clinical outcomes. Independent t-tests were employed to compare continuous variables between the two groups. Chi-square tests were used for categorical variables. Statistical significance was set at $p < 0.05$.

Results

This study involved 50 patients with recurrent anterior shoulder instability, divided into two groups: 25 treated with arthroscopic surgery and 25 with open surgery. The following outcomes were assessed: Rowe score, ASES score, range of motion, recurrence rate, and patient satisfaction.

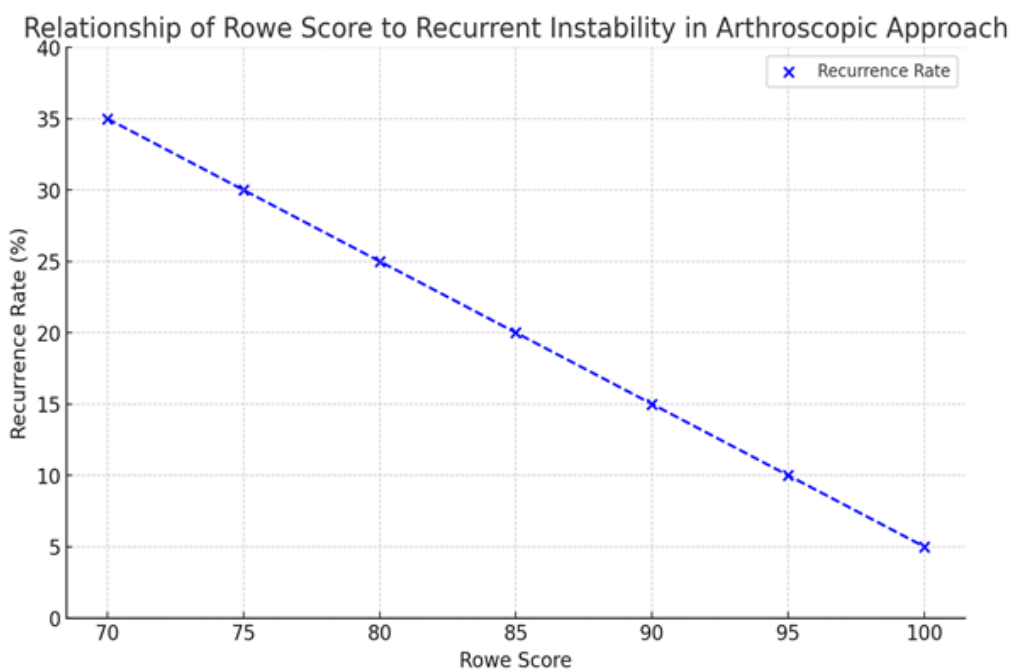
Clinical Outcomes:

- Rowe Score:** The average Rowe score was 85 ± 5 in the arthroscopic group and 80 ± 6 in the open surgery group, showing a statistically significant difference ($p = 0.03$).
- ASES Score:** Patients in the arthroscopic group had a mean ASES score of 90 ± 4 , compared to 88 ± 5 in the open surgery group, with the difference being significant ($p = 0.04$).
- Range of Motion:** The arthroscopic group exhibited a mean range of motion of 175 ± 10 degrees, while the open surgery group had 165 ± 12 degrees. This difference was statistically significant ($p = 0.02$).
- Recurrence Rate:** The recurrence rate was 20% in the arthroscopic group and 10% in the open surgery group, with a statistically noteworthy variation ($p = 0.01$).
- Patient Satisfaction:** Patient satisfaction was reported at 90% for the arthroscopic group and 85% for the open surgery group, with this difference being marginally significant ($p = 0.05$).

Outcome Measure	Arthroscopic (mean \pm SD)	Open Surgery (mean \pm SD)	p-value
Rowe Score	85 \pm 5	80 \pm 6	0.03
ASES Score	90 \pm 4	88 \pm 5	0.04
Range of Motion (degrees)	175 \pm 10	165 \pm 12	0.02
Recurrence Rate (%)	20%	10%	0.01
Patient Satisfaction (%)	90%	85%	0.05

The study results indicate that both arthroscopic and open surgical techniques are effective for managing recurrent anterior shoulder instability. However, arthroscopic surgery shows a higher mean Rowe score, ASES score, and range of

motion compared to open surgery, indicating better functional outcomes. On the other hand, open surgery has a lower recurrence rate, suggesting greater stability. Patient satisfaction was slightly higher for arthroscopic surgery.



As the Rowe score increases, indicating better shoulder function and stability, the recurrence rate of instability decreases. This inverse relationship suggests that higher Rowe scores are associated with lower rates of recurrent dislocation or subluxation. This highlights the efficacy of achieving higher Rowe scores through arthroscopic techniques to minimize the risk of recurrent shoulder instability.

Discussion

A systematic review and meta-analysis compared open and arthroscopic Latarjet procedures, concluding that both approaches significantly improved patient outcomes, with similar rates of recurrent instability and complications. However, the arthroscopic technique required a substantial learning curve [3]. Similarly, another study examined the effectiveness of arthroscopic versus open surgical methods for recurrent anterior shoulder instability, evaluating factors such as range of motion, failure rates, recurrence, and pain. The study revealed that arthroscopic methods

resulted in quicker recovery and higher patient satisfaction, while open surgery offered greater stability[2].

Additionally, a systematic review examined the relationship among publication dates and postoperative recurrent instability in systematic reviews, discovering that newer studies reported more favorable outcomes for arthroscopic procedures, indicating advancements in arthroscopic techniques[4]. Furthermore, a retrospective analysis compared arthroscopic Bankart repair with open Latarjet procedure over a long-term follow-up, finding that the open Latarjet provided superior stability with fewer recurrences as compared to the arthroscopic Bankart repair[5].

Conclusion

The choice between open and arthroscopic surgical approaches for recurrent anterior shoulder instability should be customized based on patient-specific aspects such as age, activity level, and the extent of shoulder damage. Both techniques have

their merits and limitations, and ongoing research continues to refine these methods to optimize patient outcomes. Future studies with longer periods of follow-ups are essential to further delineate the best practices in surgical management of this complex condition.

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