

OPEN VS. ARTHROSCOPIC SURGICAL MANAGEMENT FOR RECURRENT ANTERIOR SHOULDER INSTABILITY: A PROSPECTIVE STUDY

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Abstract

This study contrasts open and arthroscopic surgery for recurrent anterior shoulder instability. 100 patients were randomly randomized to open or arthroscopic surgery (n=50). Shoulder instability recurrence was the main endpoint, with functional scores (WOSI and ASES), range of motion, strength, patient satisfaction, and complications measured at 3-, 6-, 12-, and 24-months post-surgery. The open surgery group had a lower recurrence rate (4% vs. 12%, p=0.04) and somewhat improved functional outcomes (WOSI: p=0.02, ASES: p=0.03). Both groups showed equal strength and range of motion improvements, good patient satisfaction (p=0.21), and similar complication rates (open: 6%, arthroscopic: 8%). Both surgical approaches are effective, although open surgery has a lower recurrence rate and slightly better functional benefits. Patients and surgeons should choose surgical methods based on their needs and skills.

Key terms: Shoulder instability, Surgical procedures (open and arthroscopic), Functional results

Introduction

Recurrent anterior shoulder instability is a prevalent condition, especially among young and physically active adults. Frequent occurrences of traumatic dislocations often result in structural damage and recurring instability. The two main surgical procedures for this problem are open and arthroscopic operations.

Open surgery, the conventional benchmark, entails a bigger incision for direct visualisation and repair, rendering it especially efficacious in intricate instances. Nevertheless, it is linked to increased illness severity, extended recuperation periods, and heightened surgical discomfort and scarring.

On the other hand, arthroscopic surgery, which is a less intrusive procedure, has become increasingly popular because to its smaller incisions, decreased postoperative pain, and quicker recovery periods. This technique enables meticulous restoration of intra-articular structures while safeguarding adjacent tissues. Nevertheless, there are still worries regarding the enduring stability and likelihood of recurrence, particularly among individuals at high risk.

This study prospectively evaluates the results of open and arthroscopic surgical approaches in managing recurrent anterior shoulder instability. We analyze several characteristics such as rates of recurrence, functional outcomes, complications, and patient satisfaction to offer clinicians thorough and detailed information.

Methodology

Research Methodology

This prospective study was conducted at a specialized tertiary care center that focuses on orthopedics and sports medicine. The study received approval from the institutional review board, and all participants willingly provided informed permission.

Selection of patients

The study enrolled individuals between the ages of 18 and 45 who had experienced at least two instances of anterior shoulder dislocation and had not responded to conservative treatment for at least six months. The exclusion criteria encompassed multidirectional instability, substantial bone loss (exceeding 20% of the glenoid surface), rotator cuff tears, and other shoulder diseases.

Randomization and allocation

Patients who met the criteria were assigned randomly to one of two groups using a computer-generated list:

1. Initiate surgical team.
2. Group specializing in arthroscopic surgery.

Surgical Techniques

Surgical Practice

The patients had a surgical procedure called open Bankart repair, which involved employing a deltopectoral technique to directly repair the torn labrum and capsulolabral complex.

Group specializing in arthroscopic surgery.

Patients had a surgical procedure called arthroscopic Bankart repair, where standard entry points were created to repair the labrum using suture anchors.

Management and Recovery after Surgery

A standardized rehabilitation regimen was adhered to, which involved immobilizing the affected area in a sling for four weeks.

- Incremental implementation of passive range-of-motion exercises.
- Commence active range-of-motion exercises at six weeks.
- Commence resistance training workouts at the three-month mark following the surgical procedure.
- Resume participation in sports and strenuous activities after six months, as determined by evaluations.

Evaluation criteria

Baseline and follow-up visits at 3, 6, 12, and 24 months after the surgery were used to evaluate both primary and secondary outcomes.

Statistical Analysis

Analysis was conducted using SPSS software, expressing continuous variables as mean \pm standard deviation and categorical variables as percentages. A p-value of <0.05 was considered significant for independent t-tests and chi-square tests comparing baseline characteristics and outcomes. Time to recurrence was estimated using Kaplan-Meier.

Primary Outcome: - Incidence rate of shoulder instability recurrence (including any dislocation or subluxation occurrence).

Secondary outcomes include assessing functional outcomes using the Western Ontario Shoulder Instability Index (WOSI) and the American Shoulder and Elbow Surgeons (ASES) score.

- Measurement of the extent of movement (range of motion or ROM) via a goniometer.
- Evaluation of strength via an isokinetic dynamometer.
- Assessment of patient satisfaction via a visual analog scale (VAS).
- Potential risks following surgery include infection, neurovascular damage, and stiffness.

Results

Demographic and baseline characteristics of the patient

A total of one hundred patients, with fifty patients in each group, participated in the study. The demographics and baseline characteristics of the groups were comparable.

Characteristic	Open Surgery Group (n=50)	Arthroscopic Surgery Group (n=50)	p-value
Age (years)	26.8 \pm 6.2	27.3 \pm 5.8	0.64
Gender (male/female)	32/18	30/20	0.68
Duration of symptoms (months)	14.6 \pm 3.8	15.1 \pm 4.1	0.55
Baseline WOSI score	1420 \pm 120	1405 \pm 115	0.72
Baseline ASES score	57.2 \pm 10.4	56.8 \pm 11.1	0.81

Main Result

At the 24-month follow-up, the open surgery group had a markedly decreased recurrence rate in comparison to the arthroscopic surgery group.

- The Open Surgery Group consisted of 4% of the total patients, which is equivalent to 2 patients.

The Arthroscopic Surgery Group consisted of 12% of the total patients, which is equivalent to 6 individuals.

The p-value is 0.04.

Additional results

Both groups experienced significant increases in functional outcomes, while the open surgery group showed higher improvements.

WOSI Score: - Open Surgery Group: The WOSI score improved significantly from an average of 1420 ± 120 to 320 ± 90 .

- The Arthroscopic Surgery Group showed a significant improvement in their results, with a decrease from an average of 1405 ± 115 to 410 ± 95 . - The statistical analysis yielded a p-value of 0.02, indicating a significant difference between the groups.

ASES Score results: - Open Surgery Group: Increased from an average of 57.2 ± 10.4 to 90.5 ± 8.2 - Arthroscopic Surgery Group: Increased from an average of 56.8 ± 11.1 to 85.2 ± 9.6 - p-value: 0.03

Extent of Movement and Physical Power

Both cohorts demonstrated substantial enhancements in both range of motion and strength, with no notable disparities between the two groups after 24 months.

Customer Contentment

Both groups exhibited excellent levels of patient satisfaction, with a somewhat greater degree observed in the open surgery group.

VAS Score: - Open Surgery Group: 8.8 ± 1.0 - Arthroscopic Surgery Group: 8.4 ± 1.2 - p-value: 0.21

Adverse events that occur after a surgical procedure.

The overall incidence of complications was minimal and similar across the different groups.

- The Open Surgery Group had a 6% occurrence rate, with 3 patients.

The Arthroscopic Surgery Group had a prevalence of 8%, with 4 patients.

The p-value is 0.70.

Discussion

This study compared open and arthroscopic surgery methods for treating recurrent anterior shoulder instability. The results suggest that both methods significantly enhance functional outcomes and decrease recurrence rates, with open surgery demonstrating a reduced recurrence rate and marginally superior functional outcomes.

The decreased incidence of recurrence in the open surgery group is consistent with prior studies, indicating that open Bankart repair may provide superior long-term stability,

especially in complicated situations. Possible reasons for the increased recurrence incidence in the arthroscopic group could be attributed to difficulties in the surgical technique, the amount of physical activity of the patients, and undetected bone defects.

Both cohorts demonstrated substantial enhancements in functional ratings, range of motion, and strength. Both surgical techniques were highly effective, as evidenced by the high level of patient satisfaction in both groups.

- Limitations:
1. Sample size: Further research with a larger sample size is necessary to validate the results.
 2. Follow-up duration: Extended investigations are required to evaluate the longevity.
 3. The use of a single-center design restricts the capacity to apply the findings to a broader population.
 4. Surgical outcomes may vary depending on the surgeon's level of expertise.

Future Research:

- Carry out multicenter investigations with higher sample sizes.
- Extended period of monitoring to assess the long-lasting effectiveness.
- Conduct a thorough examination of individual patient characteristics that may influence the results.
- Investigate progress in arthroscopic methods.

Conclusion

Both open and arthroscopic surgical techniques can be used to treat recurrent anterior shoulder instability successfully. However, arthroscopic surgery has considerably better functional outcomes and a lower chance of recurrence when compared to open surgery. Both interventions improve shoulder functionality, increase range of motion, and result in high patient satisfaction rates while maintaining a low risk of complications. A surgeon's skill level and the particular demands of each patient should be taken into consideration while selecting a surgical procedure.

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