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Outcome Analysis of Arthroscopic Versus Open Repair in Rotator Cuff Tears

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ABSTRACT

Background: Rotator cuff tears are among the most common causes of shoulder pain and functional disability in adults. Surgical repair is indicated in symptomatic full-thickness and selected partial-thickness tears that fail conservative management. Both arthroscopic and open repair techniques are widely practiced; however, controversy persists regarding their comparative clinical outcomes, complication rates, and functional recovery.
Aim: To compare the functional and clinical outcomes of arthroscopic repair versus open repair in patients with rotator cuff tears.
Materials and Methods: This was a comparative observational study conducted in a tertiary care orthopedic center. Patients diagnosed with rotator cuff tears and undergoing either arthroscopic or open repair were included. Functional outcomes were assessed using standardized shoulder scoring systems, along with pain evaluation and range of motion assessment. Radiological evaluation was performed to assess tendon integrity where applicable. Data were statistically analyzed to compare outcomes between the two groups.
Results: Patients undergoing arthroscopic repair demonstrated superior early postoperative pain relief, faster functional recovery, and improved range of motion compared to those treated with open repair. At final follow-up, both groups showed significant improvement in functional scores, though arthroscopic repair showed a trend toward better overall outcomes with fewer postoperative complications.
Conclusion: Arthroscopic rotator cuff repair provides better early functional recovery and reduced postoperative morbidity compared to open repair, while achieving comparable long-term outcomes. Arthroscopic repair should be preferred when technically feasible.

Keywords: *Rotator cuff tear; Arthroscopic repair; Open repair; Shoulder function; Functional outcome; Comparative study.*

INTRODUCTION

Rotator cuff tears represent a common cause of shoulder pain, weakness, and restricted mobility, particularly in the middle-aged and elderly population. The rotator cuff plays a crucial role in maintaining glenohumeral stability and facilitating overhead activities. Degenerative changes, repetitive microtrauma, and acute injuries contribute to the development of rotator cuff pathology.[1]

Surgical repair is indicated in patients with persistent symptoms despite adequate conservative treatment, large or full-thickness tears, and in active individuals requiring restoration of shoulder function. Traditionally, open rotator cuff repair has been considered the standard surgical approach, providing reliable tendon healing and functional improvement. However, open repair is associated with greater soft-tissue dissection, postoperative pain, and prolonged rehabilitation.[2]

Advances in arthroscopic techniques have led to the increasing adoption of minimally invasive arthroscopic rotator cuff repair. Arthroscopy offers advantages such as better visualization of intra-articular pathology, minimal soft-tissue damage,

reduced postoperative pain, and faster rehabilitation. Despite these benefits, arthroscopic repair is technically demanding and may involve a learning curve.[3–4]

Several studies have reported comparable long-term outcomes between arthroscopic and open repair; however, variations in patient selection, tear characteristics, surgical technique, and outcome measures have resulted in inconsistent conclusions.[5–6] Therefore, this study was undertaken to compare the functional and clinical outcomes of arthroscopic versus open rotator cuff repair in patients treated at a tertiary care center, with the aim of identifying the optimal surgical approach.

MATERIALS AND METHODS

Study Design and Setting

This comparative observational study was conducted in the Department of Orthopaedics at a tertiary care teaching hospital over a period of 18 months. The study included patients diagnosed with rotator cuff tears who underwent surgical repair using either arthroscopic or open techniques.

Study Population

A total of 60 patients with rotator cuff tears were included in the study. Patients were divided into two groups based on the surgical procedure performed:

- **Group A:** Arthroscopic rotator cuff repair (n = 30)
- **Group B:** Open rotator cuff repair (n = 30)

Inclusion Criteria

- Patients aged 18–70 years
- Symptomatic partial- or full-thickness rotator cuff tears confirmed by MRI
- Failure of conservative management for at least 3 months
- Patients willing to participate and provide informed consent

Exclusion Criteria

- Massive irreparable rotator cuff tears
- Associated shoulder fractures or dislocations
- Advanced glenohumeral arthritis
- Previous surgery on the affected shoulder
- Neuromuscular disorders affecting shoulder function

Preoperative Evaluation

All patients underwent detailed clinical evaluation including history, physical examination, and assessment of shoulder function. Pain severity was assessed using the Visual Analog Scale (VAS). Functional assessment was performed using a standardized shoulder scoring system. Radiological evaluation included plain radiographs and magnetic resonance imaging (MRI) to assess tear size, tendon involvement, and muscle quality.

Surgical Technique

Arthroscopic rotator cuff repair was performed using standard portal placement under general anesthesia with patients in the beach-chair or lateral decubitus position. Tear margins were prepared, and tendon repair was carried out using suture anchors.

Open rotator cuff repair was performed through a deltoid-splitting approach. Tendon mobilization and repair were achieved using non-absorbable sutures and suture anchors where required.

Postoperative Rehabilitation

All patients followed a standardized postoperative rehabilitation protocol. The operated shoulder was immobilized in an arm sling for 4–6 weeks. Passive range-of-motion exercises were initiated in the early postoperative period, followed by active-assisted and strengthening exercises as per tolerance.

Outcome Measures

Patients were followed up at regular intervals. Outcome assessment included:

- Pain evaluation using Visual Analog Scale (VAS)
- Functional assessment using standardized shoulder scores
- Range of motion assessment
- Assessment of postoperative complications

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using statistical software. Continuous variables were expressed as mean ± standard deviation, while categorical variables were expressed as percentages. Comparison between groups was performed using Student's *t*-test and Chi-square test. A *p*-value of <0.05 was considered statistically significant.

Ethical Considerations
The study was approved by the Institutional Ethics Committee. Written informed consent was obtained from all participants prior to inclusion in the study.

RESULTS
A total of 60 patients with rotator cuff tears were included in the study and were followed for a minimum period of 6 months. Patients were divided into two groups based on the surgical procedure performed: arthroscopic repair (Group A, n = 30) and open repair (Group B, n = 30).

Demographic Profile
The mean age of patients in Group A was 52.4 ± 8.6 years, while in Group B it was 54.1 ± 9.2 years. There was no statistically significant difference between the two groups with respect to age, gender distribution, side involved, or duration of symptoms ($p > 0.05$).

Table 1: Demographic Characteristics of Patients

Parameter	Arthroscopic Group (n=30)	Open Repair Group (n=30)	p-value
Mean age (years)	52.4 ± 8.6	54.1 ± 9.2	>0.05
Male : Female	18 : 12	17 : 13	>0.05
Dominant side involved	20 (66.7%)	19 (63.3%)	>0.05
Mean symptom duration (months)	6.2 ± 2.1	6.5 ± 2.4	>0.05

Pain Assessment (VAS Score)
Preoperatively, mean VAS scores were comparable between both groups. Postoperatively, patients in the arthroscopic group showed significantly lower VAS scores at early follow-up compared to the open repair group ($p < 0.05$). At final follow-up, both groups showed significant pain reduction.

Table 2: Comparison of VAS Scores

Time Interval	Arthroscopic Group	Open Repair Group	p-value
Preoperative	7.6 ± 0.9	7.4 ± 1.0	>0.05
6 weeks	3.1 ± 0.8	4.2 ± 0.9	<0.05
Final follow-up	1.4 ± 0.6	1.9 ± 0.7	<0.05

Functional Outcome
Functional outcome scores improved significantly in both groups postoperatively. However, the arthroscopic group demonstrated superior functional scores at early and final follow-up, which was statistically significant.

Table 3: Functional Outcome Scores

Assessment Time	Arthroscopic Group	Open Repair Group	p-value
Preoperative	42.8 ± 6.4	43.1 ± 6.7	>0.05
Final follow-up	86.3 ± 7.2	79.4 ± 8.1	<0.05

Range of Motion
Postoperative range of motion was better in the arthroscopic group, particularly in forward flexion and abduction. The difference was statistically significant ($p < 0.05$).

Table 4: Range of Motion at Final Follow-up

Movement	Arthroscopic Group	Open Repair Group	p-value
Forward flexion (°)	158 ± 12	145 ± 15	<0.05
Abduction (°)	152 ± 14	138 ± 16	<0.05
External rotation (°)	52 ± 8	48 ± 9	>0.05

Postoperative Complications
The incidence of postoperative complications was lower in the arthroscopic group compared to the open repair group. No major complications such as infection or re-tear requiring revision surgery were noted.

Table 5: Postoperative Complications

Complication	Arthroscopic Group (n=30)	Open Repair Group (n=30)
Shoulder stiffness	2 (6.7%)	5 (16.7%)
Superficial infection	0	2 (6.7%)
Re-tear	1 (3.3%)	2 (6.7%)

Summary of Results
Arthroscopic rotator cuff repair resulted in significantly better early pain relief, faster functional recovery, improved range of motion, and fewer postoperative complications compared to open repair. At final follow-up, both techniques demonstrated satisfactory outcomes, with arthroscopic repair showing superior overall results.

DISCUSSION

Rotator cuff tears are a common cause of shoulder pain and functional impairment, particularly in the middle-aged and elderly population. Surgical repair is recommended in patients with persistent symptoms and functional limitation despite adequate conservative management. With advances in minimally invasive techniques, arthroscopic rotator cuff repair has gained popularity; however, open repair continues to be practiced in many centers.[1–2] The present study aimed to compare the clinical and functional outcomes of arthroscopic versus open rotator cuff repair.

In the current study, both arthroscopic and open repair techniques resulted in significant improvement in pain relief, shoulder function, and range of motion at final follow-up. These findings reaffirm that both procedures are effective in the management of rotator cuff tears when appropriately indicated. However, patients treated with arthroscopic repair demonstrated superior early postoperative pain relief and faster functional recovery compared to those who underwent open repair.[3]

The significantly lower early postoperative pain scores observed in the arthroscopic group can be attributed to minimal soft-tissue dissection, preservation of the deltoid muscle, and reduced surgical trauma. Similar observations have been reported in previous studies, which highlight reduced postoperative morbidity and earlier rehabilitation following arthroscopic repair.[3–4] In contrast, open repair involves greater soft-tissue handling, which may contribute to increased postoperative pain and delayed recovery.

Functional outcome scores in the present study improved significantly in both groups; however, the arthroscopic group achieved higher scores at final follow-up. Improved visualization of the tear, precise tendon mobilization, and the ability to address associated intra-articular pathologies arthroscopically may explain these superior outcomes. The findings of this study are consistent with published literature suggesting comparable or better functional outcomes following arthroscopic repair compared to open techniques.[5–6]

Range of motion assessment revealed better postoperative forward flexion and abduction in patients who underwent arthroscopic repair. Early mobilization and less postoperative stiffness in the arthroscopic group likely contributed to these results. Although external rotation did not show a statistically significant difference between the two groups, the overall trend favored arthroscopic repair.[7]

The complication rate in the present study was lower in the arthroscopic group. Shoulder stiffness and superficial infections were more commonly observed in patients treated with open repair. No major complications or revision surgeries were required in either group during the follow-up period. These findings support the safety and efficacy of arthroscopic rotator cuff repair.[3–4]

Despite these encouraging results, this study has certain limitations. The sample size was relatively small, and the follow-up period was limited, which may not fully reflect long-term tendon healing and re-tear rates. Additionally, the study was non-randomized, and surgeon expertise may have influenced outcomes. Future studies with larger sample sizes, randomized designs, and longer follow-up are recommended to further validate these findings.[5–7]

CONCLUSION

Both arthroscopic and open rotator cuff repair techniques are effective in improving pain relief, shoulder function, and range of motion in patients with rotator cuff tears. However, arthroscopic repair demonstrated superior early postoperative outcomes, including reduced pain, faster functional recovery, better range of motion, and lower complication rates compared to open repair. At final follow-up, arthroscopic repair showed better overall functional results while achieving comparable long-term outcomes to open repair. Based on the findings of this study, arthroscopic rotator cuff repair should be considered the preferred surgical approach when technically feasible, owing to its minimally invasive nature and favorable clinical outcomes.

LIMITATIONS AND FUTURE SCOPE

Limitations

- The study was conducted on a relatively small sample size, which may limit the generalizability of the results.
- The follow-up duration was limited and may not adequately reflect long-term tendon healing and re-tear rates.
- The study was non-randomized, and surgeon expertise and technique variability could have influenced the outcomes.
- Advanced imaging was not routinely performed in all patients during follow-up to assess tendon integrity.

Future Scope

- Larger, randomized controlled trials with longer follow-up periods are required to establish definitive conclusions regarding long-term outcomes and re-tear rates.
- Future studies may focus on cost-effectiveness analysis and quality-of-life assessment between the two techniques.
- Evaluation of outcomes based on tear size, chronicity, and patient activity level may further refine surgical decision-making.

REFERENCES

1. Boileau P, Brassart N, Watkinson DJ, Carles M, Hatzidakis AM, Krishnan SG. Arthroscopic repair of full-thickness tears of the supraspinatus: does the tendon really heal? *J Bone Joint Surg Am.* 2005;87(6):1229–1240.
2. Gartsman GM, Khan M, Hammerman SM. Arthroscopic repair of full-thickness tears of the rotator cuff. *J Bone Joint Surg Am.* 1998;80(6):832–840.
3. Burkhart SS, Danaceau SM, Pearce CE. Arthroscopic rotator cuff repair: analysis of results by tear size and repair technique. *Arthroscopy.* 2001;17(9):905–912.
4. Galatz LM, Ball CM, Teefey SA, Middleton WD, Yamaguchi K. The outcome and repair integrity of completely arthroscopically repaired large and massive rotator cuff tears. *J Bone Joint Surg Am.* 2004;86(2):219–224.
5. Romeo AA, Hang DW, Bach BR Jr, Shott S. Repair of full thickness rotator cuff tears. Gender, age, and other factors affecting outcome. *Clin Orthop Relat Res.* 1999;(367):243–255.
6. Tauro JC. Arthroscopic rotator cuff repair: analysis of technique and results at 2- and 3-year follow-up. *Arthroscopy. 1998*;14(1):45–51.
7. DeOrio JK, Cofield RH. Results of a second attempt at surgical repair of a failed initial rotator-cuff repair. *J Bone Joint Surg Am.* 1984;66(4):563–567.