



Comparative Study Of Rotator Cuff Repair Arthroscopy Vs Mini Open Techniques.

Article History:

Name of Author:

Dr. Siddharth Sharma¹, Dr. Rakesh Meena², Dr. Arshdeep Singh^{3*}

Affiliation: ¹Associate Professor, Dept of Orthopaedics, SMS Medical College, Jaipur

²Resident, Dept of Orthopaedics, SMS Medical College, Jaipur.

³Resident, Dept of Orthopaedics, SMS Medical College, Jaipur.

Corresponding Author:

Dr Arshdeep Singh.

Received: 22-10-2025

Revised: 08-11-2025

Accepted: 20-11-2025

Published: 17-12-2025

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Abstract: **INTRODUCTION:** Rotator cuff tears is one of the most common musculoskeletal disorders seen in orthopaedic practice and constitute a major cause of shoulder pain and dysfunction in adults. **AIM:** to compare the functional outcomes of rotator cuff repair performed by arthroscopic and mini-open surgical techniques. **METHODOLOGY:** This prospective comparative study was conducted in the Department of Orthopaedics at tertiary care hospital over a period of 18 months. **RESULT:** Both mini-open and arthroscopic rotator cuff repair techniques showed significant improvement in pain relief and functional outcomes with satisfactory recovery at 12 months. Arthroscopic repair demonstrated slightly better functional scores and lower complication rates, although overall long-term outcomes between the two groups were comparable. **CONCLUSION:** Both mini-open and arthroscopic rotator cuff repair are effective surgical techniques. Arthroscopic repair showed better early functional outcomes and fewer complications.

Keywords: Arthroscopy, Mini open technique, Rotator cuff repair.

INTRODUCTION

Rotator cuff tears is one of the most common musculoskeletal disorders seen in orthopaedic practice and constitute a major cause of shoulder pain and dysfunction in adults¹. These tears occur due to acute trauma or degenerative changes associated with ageing, repetitive overhead activities, and chronic tendon attrition. 20.7% of the population between 18 and 87 years of age experience at least one rotator cuff tear during their lifetime, with prevalence rising among older individuals². This condition often presents with chronic shoulder pain, weakness,

restricted range of motion, and impaired functional capacity, affecting quality of life. In severe cases, if a patient is delayed they experience sleep disturbances, inability to perform occupational tasks. Rotator cuff tears initially involve conservative management, if symptoms persist despite adequate conservative management surgical management is required. There are three major surgical approaches available for rotator cuff repair: mini-open repair, arthroscopically assisted mini-open repair, and all-arthroscopic repair^{3,4}. Among these, arthroscopic repair is preferred over the other two treatment modalities. The incidence of arthroscopic rotator cuff repairs has

increased due to advances in surgical instruments, improved visualization techniques, and enhanced surgeon expertise. Mini-open repair was earlier considered as the gold standard for rotator cuff surgery because of its favourable outcomes, with approximately 90% of patients giving satisfactory to excellent postoperative results. This technique involves limited open exposure with reduced soft tissue disruption compared to traditional open repair⁵. Despite the above advantages, mini-open procedures still have some disadvantages that include, increased postoperative pain, deltoid muscle injury, prolonged rehabilitation, and a risk of postoperative stiffness⁶⁻⁷. In contrast, arthroscopic repair has some advantages such as smaller incision size, better cosmetic result, reduced soft tissue trauma, decreased postoperative pain, shorter hospital stay, faster rehabilitation. Furthermore, arthroscopy also allows evaluation and management of any other associated intra-articular pathologies during the same procedure. Although arthroscopic repair is now performed by many surgeons, but its higher cost, steep learning curve, and technical complexity has now remained a matter of concern^{8,9}. Moreover, the superiority of arthroscopic repair over mini-open repair in terms of long-term functional outcomes is still a subject of debate. Still further comparative evaluation is necessary to determine the most effective surgical approach¹⁰. In this context, the present study was undertaken to compare the outcomes of rotator cuff repair using arthroscopic and mini-open techniques.

AIM

The aim of this study was to compare the functional outcomes of rotator cuff repair performed by arthroscopic and mini-open surgical techniques.

METHODOLOGY

This prospective comparative study was conducted in the Department of Orthopaedics at sms medical college over a period of 18 months from December 2023. A total of 42 patients diagnosed with symptomatic rotator cuff tears who failed to improve with conservative management were included in the study. Patients aged above 18 years with clinically and radiologically confirmed rotator cuff tears were involved. Patients with associated fractures, previous shoulder surgeries, severe arthritis, neurological disorders affecting shoulder function, or active infection were excluded from the study. The patients were divided into two groups based on the approached surgical technique. Group A consisted of patients who underwent arthroscopic rotator cuff repair, while Group B included patients treated with the mini-open repair technique. Patients were followed up postoperatively. Functional outcomes were assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) score, pain assessment using the Visual Analogue Scale (VAS), and postoperative complications were evaluated.

RESULTS

TABLE 1: Demographic of participants (n=42)

Parameter	Mini-open Group (n=21)	Arthroscopic Group (n=21)
Mean age (years)	52.4 ± 8.1	50.8 ± 7.6
male	13 (61.9%)	12 (57.1%)
Female	8 (38.1%)	9 (42.9%)
Mean tear size	2.8 ± 0.7 cm	2.5 ± 0.6 cm
Dominant shoulder involved	15 (71.4%)	16 (76.2%)

The mean age of patients in the mini-open group was 52.4 ± 8.1 years, while in the arthroscopic group it was 50.8 ± 7.6 years. Male predominance was observed in both groups, with dominant shoulder involvement seen in the majority of patients and a mean tear size of 2.8 ± 0.7 cm in the mini-open group and 2.5 ± 0.6 cm in the arthroscopic group.

TABLE 2: CLINICAL PRESENTATION OF PATIENTS

Clinical Feature	Mini-open Group (n=21)	Arthroscopic Group (n=21)
Pain in shoulder	20 (95.2%)	21 (100%)
Difficulty in overhead abduction	18 (85.7%)	19 (90.5%)
Restriction of movement	16 (76.2%)	15 (71.4%)
Night pain	13 (61.9%)	14 (66.7%)
Weakness of shoulder	12 (57.1%)	13 (61.9%)

Pain in the shoulder was observed in 95.2% of the mini-open group and all patients in the arthroscopic group, followed by difficulty in overhead abduction in 85.7% and 90.5% of patients respectively. Restriction of movement, night pain, and shoulder weakness were also commonly observed clinical features in both groups with comparable

distribution.

TABLE 3: Comparison of UCLA SCORE,ASES SCORE,DASH SCORE and VAS PAIN SCORE between two groups

	Time Interval	Mini-open Group	Arthroscopic Group
UCLA SCORE	Pre-operative	11.8 ± 2.1	12.1 ± 2.4
	12 months	31.2 ± 2.3	31.8 ± 2.1
ASES SCORE	Pre-operative	30.4 ± 5.2	31.1 ± 4.9
	12 months	84.1 ± 5.4	86.3 ± 4.8
DASH SCORE	Pre-operative	61.4 ± 8.5	60.8 ± 7.9
	12 months	7.4 ± 4.3	4.8 ± 3.9
VAS PAIN SCORE	Pre-operative	8.2 ± 1.1	8.0 ± 1.0
	12 months	0.8 ± 0.5	0.9 ± 0.6

Both the mini-open and arthroscopic groups demonstrated significant improvement in functional outcome scores at 12 months follow-up. UCLA and ASES scores improved markedly in both groups, while DASH and VAS pain scores decreased substantially.

TABLE 4: POST-OPERATIVE COMPLICATIONS

Complication	Mini-open Group (n=21)	Arthroscopic Group(n=21)
Re tear / recurrence	2 (9.5%)	1 (4.8%)
Superficial Infection	1 (4.8%)	0
Shoulder stiffness	2 (9.5%)	1 (4.8%)
Neurovascular injury	0	0
No complications	16 (76.1%)	19 (90.4%)

Post-operative complications were minimal in both groups, with re-tear or recurrence observed in 9.5% of the mini-open group and 4.8% of the arthroscopic group. Most patients had no complications, accounting for 76.1% in the mini-open group and 90.4% in the arthroscopic group, while superficial infection and shoulder stiffness were noted in a few cases.

TABLE 5: FINAL FUNCTIONAL OUTCOME

Outcome	Mini-open Group (n=21)	Arthroscopic Group(n=21)
Excellent	11 (52.4%)	13 (61.9%)
Good	7 (33.3%)	6 (28.6%)
Fair	2 (9.5%)	1 (4.8%)
Poor	1 (4.8%)	1 (4.8%)

Excellent functional outcome was achieved in 52.4% of patients in the mini-open group and 61.9% of patients in the arthroscopic group, while good outcomes were observed in 33.3% and 28.6% of patients respectively. Fair and poor outcomes were seen only in a small proportion of patients in both groups.

DISCUSSION

In the present study, the mean age of patients in the mini-open group was 52.4 ± 8.1 years, while the arthroscopic group had a mean age of 50.8 ± 7.6 years. 61.9% male patients were in the mini-open group and 57.1% in the arthroscopic group. Female patients constituted 38.1% and 42.9% of the mini-open and arthroscopic groups, respectively. (2.8 ± 0.7 cm) was the mean tear size in the mini-open group compared to the arthroscopic group (2.5 ± 0.6 cm). Our study is inconsistent with OZCAN MS et al¹¹ reported no significant difference in the mean age and gender distribution of the groups ($p > 0.05$). Similarly, Thakor KN et al¹² reported 2.73 cm (± 0.89 cm) mean tear size in their study.

Pain in the shoulder was observed in 95.2% of patients in the mini-open group and 100% of patients in the arthroscopic group. Difficulty in overhead abduction

was seen in 85.7% and 90.5% of patients in the mini-open and arthroscopic groups respectively. Complaint of Restriction of shoulder movements, Night pain, Weakness of the shoulder joint comparable in the two groups. In contrast Thakor KN et al¹² reported inability of overhead abduction followed by pain in the shoulder as the main symptom.

Both the mini-open and arthroscopic repair groups showed marked improvement in functional and pain assessment scores during the follow-up period. The mean pre-operative UCLA scores improved from 11.8 ± 2.1 to 31.2 ± 2.3 in the mini-open group and from 12.1 ± 2.4 to 31.8 ± 2.1 in the arthroscopic group at 12 months. Similarly, the ASES scores increased from 30.4 ± 5.2 to 84.1 ± 5.4 in the mini-open group and from 31.1 ± 4.9 to 86.3 ± 4.8 in the arthroscopic group. DASH scores showed substantial reduction from 61.4 ± 8.5 to 7.4 ± 4.3 in the mini-open group and from 60.8 ± 7.9 to 4.8 ± 3.9 in the arthroscopic

group, indicating improved shoulder function. VAS pain scores also decreased significantly from 8.2 ± 1.1 to 0.8 ± 0.5 in the mini-open group and from 8.0 ± 1.0 to 0.9 ± 0.6 in the arthroscopic group. Overall, both surgical techniques demonstrated satisfactory functional recovery and pain relief with comparable long-term outcomes.

Thakor KN et al¹² The maximum incidence of rotator cuff tears occurred in 41-50 year age group patients (43%), while age group 61-70 year comprises 20% of total patients. The patients had an almost equal sex demographic. Mean tear size was 2.73 cm (+/- 0.89 cm). The predominant symptom in these patients was inability of overhead abduction followed by pain in the shoulder. At presentation the mean UCLA score in mini-open group was 11.31, which improved to 31.18 at the end of 1 year, while for arthroscopy group, the presenting UCLA score was 11.95 which improved to 30.36 at the end of one year. However, this difference in improvement is not statistically significant (p value = 0.97). The ASES score for mini-open group at presentation was 29.95 which improved to 82.54 at 1-year follow-up, while the ASES score for the arthroscopic group was 30.61 which improved to 83.46 at 1 year follow-up. This difference in improvement is not statistically significant (p = 0.48). This shows that there is no statistical significance in post-operative UCLA and ASES scores of both mini-open and arthroscopic cuff repair. Siddiqui et al¹³ The meta-analysis included a total of 15 studies, encompassing 917 patients—461 treated arthroscopically and 456 with the mini-open approach. Arthroscopic repair was associated with significantly lower pain scores (Standardized Mean Difference: -0.82, 95% CI: -1.15 to -0.49, p < 0.001) and higher functional outcome scores (Odds Ratio: 1.85, 95% CI: 1.22 to 2.78, p = 0.004) compared to mini-open repair.

Sauerbrey AM et al¹⁴ Improvement in scores within each group was significant, but the difference in total scores between the 2 techniques was not statistically significant.

Gbs, Varun et al¹⁵ Both techniques showed significant improvements over time. Preoperative and early postoperative DASH scores were similar (p>0.05). Arthroscopy showed significantly lower DASH scores at 3 months (17.60 ± 11.64 vs. 23.60 ± 10.90 ; p=0.02), 6 months (11.80 ± 12.03 vs. 15.33 ± 10.25 ; p=0.03), and 12 months (4.53 ± 5.90 vs. 7.60 ± 5.19 ; p=0.04).

Post-operative complications were relatively low in both the mini-open and arthroscopic repair groups. Re-tear or recurrence was observed in 2 patients (9.5%) in the mini-open group and 1 patient (4.8%) in the arthroscopic group. Superficial surgical site infection was noted in 1 patient (4.8%) undergoing

mini-open repair, whereas no infection was reported in the arthroscopic group. Shoulder stiffness developed in 2 patients (9.5%) in the mini-open group and 1 patient (4.8%) in the arthroscopic group. No neurovascular injury was observed in either group during the study period. The majority of patients remained free of complications, accounting for 81.0% in the mini-open group and 85.7% in the arthroscopic group. Siddiqui et al¹³ reported lower rates of completion, and the re-tear rates were significantly reduced in the arthroscopic group (Risk Ratio: 0.58, 95% CI: 0.36 to 0.93, p = 0.024).

Functional outcome assessment revealed satisfactory results in both the mini-open and arthroscopic repair groups. Excellent outcomes were achieved in 11 patients (52.4%) in the mini-open group and 13 patients (61.9%) in the arthroscopic group. Good outcomes were observed in 7 patients (33.3%) undergoing mini-open repair and 6 patients (28.6%) undergoing arthroscopic repair. Fair outcomes were noted in 2 patients (9.5%) in the mini-open group and 1 patient (4.8%) in the arthroscopic group. Poor outcomes were observed in 1 patient (4.8%) in each group. Overall, the majority of patients in both groups achieved excellent to good functional recovery following rotator cuff repair. Chebbi et al¹⁶ In the arthroscopic group, out of 32 patients, 28 got excellent or good results whereas in the mini open out of 32 patients 27 achieved excellent or good outcomes.

CONCLUSION

Our study showed a comparison of mini open technique and arthroscopy. Comparison observed by using functional outcome scores like UCLA, ASES, DASH, and VAS which shows comparative improvement in both. However arthroscopy techniques have slightly better outcome but that is statistically not significant. Postoperative complications were minimal in both groups, with low rates of re-tear, infection, and shoulder stiffness. Arthroscopic repair had advantage in lower complication rates, and better early functional recovery, while mini-open repair also produced satisfactory outcomes. Overall, both surgical techniques are effective treatment options for rotator cuff tears, and the choice of procedure may depend on surgeon expertise, patient characteristics, tear morphology, and available resources.

REFERENCE

1. F.T. Blevins, R.F. Warren, C. Cavo, et al. Arthroscopic assisted rotator cuff repair: Results using a mini-open deltoid splitting approach. *Arthroscopy*. 12: 1996; 50–59
2. S.S. Burkhart, S.M. Danaceau, C.E. Pearce Jr. Arthroscopic rotator cuff repair: Analysis of results by tear size and by repair technique—

- Margin convergence versus direct tendon-to-bone repair. *Arthroscopy*. 17: 2001; 905–912
3. W.F. Bennett. Arthroscopic repair of massive rotator cuff tears: A prospective cohort with 2- to 4-year follow-up. *Arthroscopy*. 19: 2003; 380–390
4. H. Ellman, S.P. Kay, M. Wirth. Arthroscopic treatment of full-thickness rotator cuff tears: 2- to 7-year follow-up study. *Arthroscopy*. 9: 1993; 195–200
5. W.F. Bennett. Arthroscopic repair of full-thickness supraspinatus tears (small-to-medium): A prospective study with 2- to 4-year follow-up. *Arthroscopy*. 19: 2003; 249–256
6. C.K. Jones, F.H. Savoie III. Arthroscopic repair of large and massive rotator cuff tears. *Arthroscopy*. 19: 2003; 564–571
7. R.J. Hawkins, G.W. Misamore, P.E. Hobeika. Surgery for full-thickness rotator-cuff tears. *J Bone Joint Surg Am*. 67: 1985; 1349–1355
8. H. Ellman, G. Hanker, M. Bayer. Repair of the rotator cuff. End-result study of factors influencing reconstruction. *J Bone Joint Surg Am*. 68: 1986; 1136–1144
9. T.J. Shimmers, P.G. Noordsij, J.F. Orwin. Arthroscopically assisted mini-open rotator cuff repair. *Arthroscopy*. 18: 2002; 21–26
10. D.T. Harryman II, L.A. Mack, K.Y. Wang, S.E. Jackins, M.L. Richardson, F.A. 3rd Matsen. Repairs of the rotator cuff. Correlation of functional results with integrity of the cuff. *J Bone Joint Surg Am*. 73: 1991; 982–989
11. OZCAN MS, VAROL A, KILINC BE. Arthroscopic versus Mini-Open Rotator Cuff Repair: Should We Ignore the Mini-Open Surgery? *Acta Chir Orthop Traumatol Cech*. 2021;88(5):369-374. doi: 10.55095/achot2021/054. PubMed PMID: 34738896.
12. Thakor KN, Amin PC, Patel ZM, Dalal AN, Patel SN. Comparison of outcome between mini-open and arthroscopic rotator cuff repair. *Indian J Orthop Surg* 2021;7(1):67-72.
13. Siddiqui, M. H., None, S. C. & None, H. V. N. (2025). Arthroscopic Versus Mini-Open Rotator Cuff Repair: A Meta-Analysis of Clinical Outcomes. *Journal of Contemporary Clinical Practice*, 11(3), 613-622.
14. Sauerbrey AM, Getz CL, Piancastelli M, Iannotti JP, Ramsey ML, Williams GR Jr. Arthroscopic versus mini-open rotator cuff repair: a comparison of clinical outcome. *Arthroscopy*. 2005 Dec;21(12):1415-20. doi: 10.1016/j.arthro.2005.09.008. PMID: 16376228.
15. Gbs, Varun & S, Gurucharan & Sekar, Somasundaram & T, Darshan & Chowdhary, Shuchindra. (2026). A Comparative Study of Functional Outcomes of Rotator Cuff Repairs Using Arthroscopy Versus Mini-Open Techniques. *NATIONAL BOARD OF EXAMINATIONS JOURNAL OF MEDICAL SCIENCES*. 4. 739-750. 10.61770/nbejms.2026.v04.i05.010.
16. Chebbi, P. K., Rana, M., & M., M. K. (2020). A prospective comparative study of mini-open versus arthroscopic repair of supraspinatus tear. *International Journal of Research in Orthopaedics*, 6(4), 777–782. <https://doi.org/10.18203/issn.2455-4510.IntJResOrthop20202684>.