**Journal of Advanced Medical and Dental Sciences Research**

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

# Original Research

## A comparative assessment of mini-open repair versus a completely arthroscopic technique for rotator cuff tears

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***ABSTRACT:***
**Background:** Rotator cuff conditions, the main cause of pain in the shoulder girdle, affect 20% of the general population and up to 50% of patients over 80 years. The present study was conducted to compare mini-open" repair versus a completely arthroscopic technique for rotator cuff tears. **Materials & Methods:** 68 patients with rotator cuff injury of both genders were divided randomly into 2 groups of 34 each. Group I patients were treated with mini open and group II with arthroscopic technique. Simple shoulder test (SST), University of California, Los Angeles (UCLA) rating scale, visual analog pain assessment (VAS) and SF12 was assessed. **Results:** Group I had 20 males and 14 females and group II had 18 males and 16 females. The mean UCLA in group I was 15 and in group II was 28, VAS pain improvement was 3.8 in group I and 4.7 in group II, short shoulder test improvement was 5.2 in group I and 4.1 in group II, active forward flexion improvement was 35 degrees in group I and 17 degree in group II and active abduction improvement was 30 degrees in group I and 21 degree in group II. The difference was significant (P< 0.05). **Conclusion:** Both treatment modalities found to be equally effective in management of rotator cuff injury cases.
**Key words:** Arthroscopic, Rotator cuff, Simple shoulder test

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**This article may be cited as:** Thakkar R, Qureshi MS. Tibial cleaning method for cemented total Knee Arthroplasty- A clinical study. J Adv Med Dent Scie Res 2018;6(1):165-168.

### INTRODUCTION

Shoulder pain has a high prevalence in the population, ranging from 7 to 26%. Rotator cuff conditions, the main cause of pain in the shoulder girdle, affect 20% of the general population and up to 50% of patients over 80 years. Standardized clinical assessment is essential to determine the efficacy of a treatment and also to compare the results of different studies; it is crucial in clinical research. Methods for evaluating the results of orthopedic treatment have been modified in recent years. Previously, measurements were based on physical examination, by examining joint mobility and muscle strength. However, questionnaires or clinical scales have been developed that have improved the evaluation of results. However, there is a wide variation in the measurement tools. More than 40 scales are described to assess shoulder pain and function. In addition, the measurement of the range of motion and strength, and the description of the imaging findings also do not have a consensus.

Traditional treatment of full thickness tears of the rotator cuff has consisted of open surgical repair. Reported satisfactory outcomes for open repair have ranged from 70% to 95%. Although the effectiveness of open rotator cuff repair is well established, significant pain and morbidity can be associated with the procedure. A significant limitation to rehabilitation after open repair is pain associated with reattachment of the deltoid to the acromion. More recently, reports have described the evolution of rotator cuff repair to help minimize deltoid trauma and expedite post-operative rehabilitation. Good results have been reported with arthroscopically-assisted "mini-open" (< 3 cm incision) repair, as well as completely arthroscopic techniques. The present study was conducted to compare mini-open" repair

versus a completely arthroscopic technique for rotator cuff tears.

## MATERIALS & METHODS

The present study comprised of 68 patients with rotator cuff injury of both genders. All were informed regarding the study and their written consent was obtained.

Data pertaining to patients such as name, age, gender etc. was recorded. Patients were divided randomly into 2 groups of 34 each. Group I patients were treated with mini open and group II with arthroscopic technique. Simple shoulder test (SST), University of California, Los Angeles (UCLA) rating scale, visual analog pain assessment (VAS) and SF12 was assessed and compared. Results thus obtained were subjected to statistical analysis; P value less than 0.05 was considered significant.

## RESULTS

**Table I Distribution of patients**

| Groups | Group I | Group II |
|---|---|---|
| Methods | Mini open | Arthroscopic repair |
| M:F | 20:14 | 18:16 |

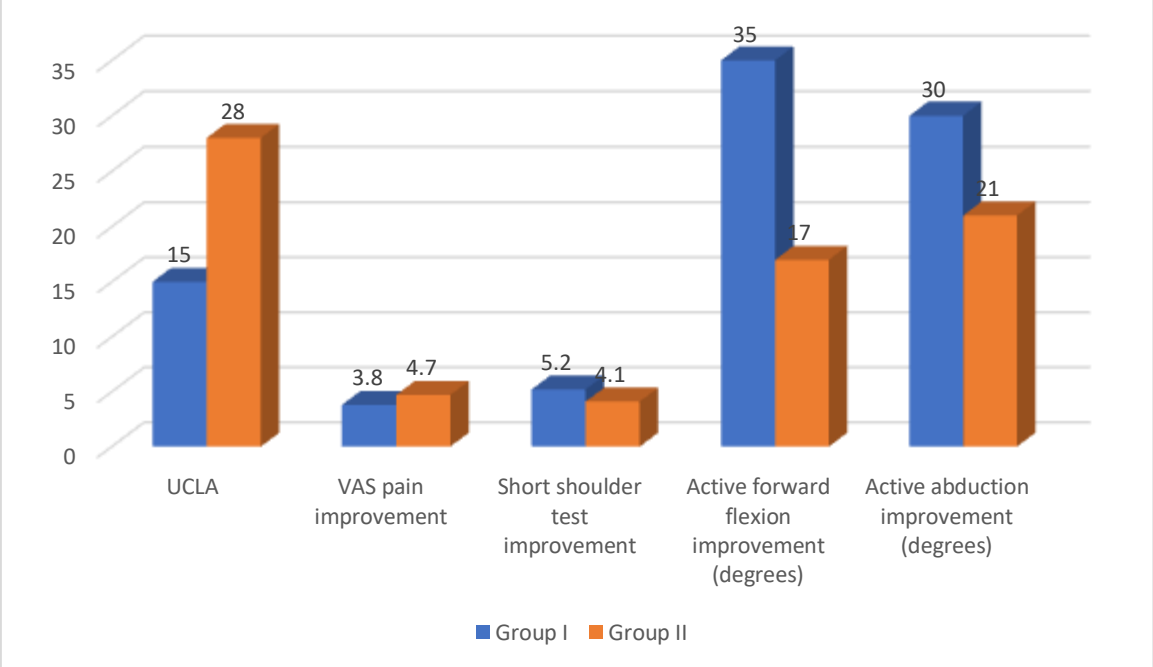
Table I shows that group I had 20 males and 14 females and group II had 18 males and 16 females.

**Table II Comparison of parameters**

| Parameters | Group I | Group II | P value |
|---|---|---|---|
| UCLA | 15 | 28 | 0.01 |
| VAS pain improvement | 3.8 | 4.7 | 0.02 |
| Short shoulder test improvement | 5.2 | 4.1 | 0.07 |
| Active forward flexion improvement (degrees) | 35 | 17 | 0.12 |
| Active abduction improvement (degrees) | 30 | 21 | 0.18 |

Table II, graph I shows that mean UCLA in group I was 15 and in group II was 28, VAS pain improvement was 3.8 in group I and 4.7 in group II, short shoulder test improvement was 5.2 in group I and 4.1 in group II, active forward flexion improvement was 35 degrees in group I and 17 degree in group II and active abduction improvement was 30 degrees in group I and 21 degree in group II. The difference was significant (P< 0.05).

**Graph I Comparison of parameters**




## DISCUSSION

Rotator cuff pathology is one of the most common conditions affecting the shoulder.[9] Anatomic studies detailing rotator cuff tears in cadavers have noted a prevalence ranging from 17% to 72%.[10] Traditional treatment of full thickness tears of the rotator cuff has

consisted of open surgical repair.[11] Reported satisfactory outcomes for open repair have ranged from 70% to 95%. Although the effectiveness of open rotator cuff repair is well established, significant pain and morbidity can be associated with the procedure. [12]The present study was conducted to compare mini-open" repair versus a completely arthroscopic technique for rotator cuff tears.

In present study, group I had 20 males and 14 females and group II had 18 males and 16 females. Pearsall et al[13] evaluated patients who underwent a "mini-open" repair versus a completely arthroscopic technique for small to large size rotator cuff tears. Fifty-two patients underwent "mini-open" or all arthroscopic repair of a full thickness tear of the rotator cuff. There were 31 females and 21 males. The average follow-up was 50.6 months (27 – 84 months). The average age was similar between the two groups [arthroscopic x = 55 years/miniopen x = 58 years, p = 0.7]. Twenty-seven patients underwent arthroscopic repair and 25 underwent repair with a mini-open incision. The average rotator cuff tear size was 3.1 cm (range: 1–5 centimeters). There was no significant difference in tear size between the two groups (arthroscopic group = 2.9 cm/mini-open group = 3.2 cm, p = 0.3). Overall, there was a significant improvement from pre-operative status in shoulder pain, shoulder function as measured on the Simple Shoulder test and UCLA Shoulder Form. Visual analog pain improved, on average, 4.4 points and the most recent Short Shoulder Form and UCLA scores were 8 and 26 respectively. Both active and passive glenohumeral joint range of motion improved significantly from pre-operatively.

We found that mean UCLA in group I was 15 and in group II was 28, VAS pain improvement was 3.8 in group I and 4.7 in group II, short shoulder test improvement was 5.2 in group I and 4.1 in group II, active forward flexion improvement was 35 degrees in group I and 17 degree in group II and active abduction improvement was 30 degrees in group I and 21 degree in group II. Kim et al[14] compared the outcomes of arthroscopic repair of medium and large rotator cuff tears with the outcomes for mini-open repair of similar tears in which arthroscopic repair was technically unsuccessful. They evaluated 76 patients who were treated for full-thickness rotator cuff tears either by all-arthroscopic (42 patients) or mini-open salvage of technically unsuccessful arthroscopic repair (34 patients). Patients who had acromioclavicular arthritis, subscapularis tear, or instability were excluded. There were 39 men and 37 women, with a mean age of 56 years (range, 42 to 75 years). At a mean follow-up of 39 months (range, 24 to 64 months), the results of both groups were compared using the University of California Los Angeles and American Shoulder and Elbow Surgeons shoulder rating scales. Shoulder scores improved in all ratings in both groups (P <.05). Overall, 66 patients showed excellent or good and 10 patients showed fair or poor scores by the University of California Los Angeles scale. Seventy-two patients satisfactorily returned to previous activity, and 4 showed unsatisfactory returns.

Saverud et al[15] in their study sixty-four shoulders (58 patients) were identified; 35 in the all-arthroscopic group and 29 in the mini-open group. Average follow-up for all patients was 44.6 months, with a minimum of 24 months. The all-arthroscopic group included 3 small tears (< 1 cm), 24 medium-size tears (1 to 3 cm), and 9 large tears (3 to 5 cm). The mini-open group included 2 small tears, 9 medium tears, and 18 large tears. All patients in both groups underwent arthroscopic assessment with arthroscopic subacromial decompression. None underwent formal acromioclavicular joint resection. Four of the all-arthroscopic and 11 of the mini-open patients underwent coplaning of the acromioclavicular joint. Anchors were the primary method of arthroscopic fixation, with an average of 1.5 anchors per case. The average final follow-up UCLA score for the arthroscopic group was 32.6 and for the mini-open group was 31.4, and the average final follow-up ASES score for the arthroscopic group was 91.7 and for the mini-open group was 90.0. No patients in the arthroscopic group developed fibrous ankylosis, whereas 4 patients in the mini-open group developed the condition (14%). No anchor-related complications were noted. Shoulders in the all-arthroscopic group showed greater motion at 6 and 12 weeks postoperatively and slightly better motion at final review.

## CONCLUSION

Authors found that both treatment modalities found to be equally effective in management of rotator cuff injury cases.

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