

A COMPARATIVE STUDY OF ROTATOR CUFF REPAIR- SINGLE ROW VERSUS DOUBLE ROW REPAIR

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Abstract

Background: Rotator cuff tears are one of the common complaints in orthopaedics. All age groups are affected by rotator cuff pathology. There are prominently two techniques in Rotator cuff repair. Single and double row technique. So, this study is aimed to compare the results of single row versus double row technique. **Materials and Methods:** A total of 40 patients were included in the study after acquiring ethics committee approval. 20 patients in each group. Patients were evaluated on the basis of age, sex, clinical examination, MRI and the scoring systems UCLA (University of California at Los Angeles) & ASES (The American Shoulder and Elbow Surgeons Shoulder Score). **Results:** Out of 40 patients, 26 were males and majority of them were between 51 to 60 years. And most of them had partial thickness tears and 36 members had traumatic tears. **Conclusion:** In the present study, based on our observations and results, Arthroscopic rotator cuff repair offered good results and enabled the same reconstruction as with open technique and avoided its complications. And it shows that there are no advantages in using a double row suture anchor technique to restore the anatomical footprint.

INTRODUCTION

From minor bursal or articular side irritation and tendonitis to severe degenerative rotator cuff arthropathy, rotator cuff disease includes a broad spectrum of pathologies. Adults of all ages can develop rotator cuff disease, and other shoulder conditions must be ruled out by a thorough medical history and physical examination.^[1] In the recent past, arthroscopic treatment was used for small tears whereas open surgery was needed for larger tears. The ability to repair even the largest tears using an arthroscopic technique has improved.

With advancements in arthroscopic procedures, the results of rotator cuff repairs are now on par with those of open surgery. Re-tear rates after arthroscopic repair range from 76 to 94% and between 20 to 70% for open or mini-open repair. According to certain research, creating a rotator cuff footprint is essential for rotator cuff healing and early strength. A double row repair technique that reconstructs the rotator cuff footprint has been in use following the advent of the 3-dimensional

reconstruction idea of the footprint. Due to the improved biomechanical outcomes documented by the double row repair approach, many shoulder surgeons now employ it. A few clinical studies on the effectiveness of the double row repair procedure do exist, though. This study compares the clinical results of arthroscopic suture anchor-assisted single row repair (Group I) versus double row repair (Group II) after cuff repair.

MATERIALS AND METHODS

40 patients who underwent arthroscopic rotator cuff repair in the Department of Orthopaedics of a tertiary care teaching hospital between June 2021 and June 2022 were taken into study. After receiving institutional ethics committee permission and receiving each patient's signed informed consent, the study was carried out.

The study includes patients who underwent MRI and were found to have cuff tears or were suspected to have them after a clinical examination. Twenty patients were treated using the single row approach

and 5 mm suture anchors for arthroscopic repair of rotator cuff tears and 20 patients using the double row method.

Individuals with less than a year of follow-up, those with concomitant fractures and rotator cuff tears, as well as those with irreparable or revision rotator cuff tears were excluded.

The protocol included evaluation of patients according to his/her symptoms and his functional ability to do his activities of daily living. A proforma was designed which was filled by the patient himself/herself pre operatively and on his/her subsequent visits post operatively at 3 weeks, 6 weeks, 12 weeks, 6 months and 1 year. The patient filled the subjective data by themselves while the muscle strength and range of motion are assessed by the surgeon and documented. The scoring systems used were UCLA (University of California at Los Angeles) & ASES (The American Shoulder and Elbow Surgeons Shoulder Score).

A single surgeon with training in arthroscopy performed all surgeries under general anaesthesia. The arm was suspended with five to ten pounds of balanced suspension at 20 to 30 degrees of abduction and 20 degrees of forward flexion.

Four portals were used. The typical 4 mm arthroscope was primarily inserted through the posterior and lateral portals (the viewing portals), while the instruments were inserted through the anteromedial and anterolateral portals (the working portals). Reactive synovitis, bursal tissue, and adhesions were removed from the subacromial area. By removing superficial adhesions between the cuff and acromial arch, tendon mobility was increased. Where necessary, a superior capsular release and rotator cuff-coracohumeral ligament release was done to allow the supraspinatus tendon to be reduced to its anatomical position under low stress.

With the use of a shaver or a basket punch, a limited debridement of the deteriorated tendon was carried out. The upper surface of the Greater Tuberosity was abraded with a burr, removing all soft tissue and cortical bone, to create a bleeding cancellous bone bed, after sufficient visualisation, preparation, and tendon release. But no trough was produced. (Figure 1)

The anchor holes were drilled at intervals of 5 to 7 mm and at a distance of 10 mm from the greater tuberosity's apex using the anterolateral portal. Double loaded suture anchors were used. The tendon was then grasped by an arthroscopic clamp that was placed through the same anterolateral portal, allowing the assistant to apply tension to it by tugging laterally on the clamp. Via the anteromedial portal, a suture passer was inserted, and the suture was passed in the shape of an

inverted mattress close to the musculotendinous junction and some distance medial to the tendon edge. One of the suture limbs was retrieved through the anterolateral portal using a grasping clamp. Duncan's knots or a basic sliding knot were used to tie the sutures.

The majority of the patients received two or three horizontal mattress sutures. In order to reconstruct the supraspinatus footprint, the double row procedure includes a row of lateral suture anchors in addition to medial row. When necessary, such as in patients who had signs of cuff impingement against the acromial arch in anterosuperior direction, a subacromial decompression with acromioplasty was carried out. As needed, a biceps tenotomy was performed.

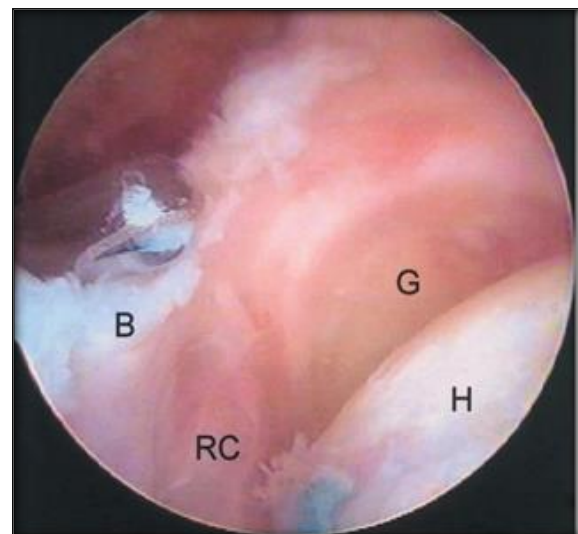


Figure 1: Arthroscopic debridement of the posterior margin of a rotator cuff tear through the posterior portal while viewing through the lateral portal. The overlying bursa (B) is debrided until the margin of the rotator cuff (RC) is exposed. G, glenoid; H, humeral head

All patients were discharged on 3rd day and asked to come back on 12th day for suture removal.

All patients were asked to come back at 3 weeks, 6 weeks, 12 weeks, 6 months and 1 year. Shoulder immobilization was done till 3 weeks. Later patients were started on active assisted Range of Movements (ROM) at 3-4 weeks and strengthening exercises from 8th week.

RESULTS

26 out of the 40 cases were men and 14 were women. And most of the patients were between the ages of 51 and 60(16) [Table 1].

Table 1: Age distribution of patients

Age in years	Number of patients	%
<30	2	5
31-40	2	5
41-50	12	30

Anatomical rotator cuff footprint is restored and tendon-bone contact area is increased with a double row of suture anchors, creating a better environment for tendon healing, according to a biomechanical study by Kim DH et al. comparing single and double row suture anchor techniques for rotator cuff repair.^[2] Randomised control trial by Franceschi et al, proved that arthroscopic single-row fixation technique restores 65% of the normal surface area, failing to restore the normal footprint of the supraspinatus tendon to the greater tuberosity. Double row suture anchor fixation fully reproduces the original supraspinatus footprint, decreases the gap formation and strain over the footprint, and improves its initial strength and stiffness when compared to a conventional single-row repair.^[3]

Single row repairs were comparable to double row repairs in terms of load failure, cycle displacement, and gap creation, according to a systematic review by Ying ZM et al.^[4] Although the rotator cuff integrity was more likely to be preserved with double row repair, comparative retrospective investigations found that the clinical outcomes of single row and double row anchor suture approach were equivalent.⁴ An Arthroscopic RCR with either an SR or a DR fixation approach produced good clinical long-term results, according to a 10-year study by Plachel F et al. Although DR repair marginally improved tendon integrity during long-term follow-up, no clinical advantage over SR repair was discovered.^[5] The mechanical advantages evidenced in cadaveric studies do not translate into superior clinical performance when compared with the more traditionally, technically less demanding, and economically more advantageous technique of single row suture anchor repair.^[6]

The double-row technique has been recommended as a means of increasing the contact area between the repaired rotator cuff and the native bone bed.^[7,8] Rotator cuff surgery aims to provide tendon fixation secure enough to hold the repaired tendon in place until biological healing occurs. Several factors may be implicated in failure of rotator cuff repairs, including suture or knot failure, inadequate tendon to bone fixation, and lack of tendon to bone healing. As we re-insert tendinous tissue into bone, theoretically only the re-constitution of enthesial fibrocartilage would guarantee an optimal outcome. The concept of restoration of the anatomical footprint is appealing, but we did not find any statistical difference between the two techniques. Also, double row repair requires longer surgical time, is more expensive as a greater number of suture anchors is required, and may well be

technically more demanding. In conclusion, our study shows that there are no advantages in using a double row suture anchor technique to restore the anatomical footprint.

CONCLUSION

Arthroscopic rotator cuff repair offered good results and enabled the same reconstruction as with open technique and avoided its complications. In this study, the clinical results of the single and double row techniques are equivalent. A double row technique creates a technically superior construct when restoring the rotator cuff's anatomic footprint compared to the single row method, however these mechanical advantages do not transfer into superior clinical performance.

Our study concludes by demonstrating that there are no benefits to restoring the anatomical footprint utilizing a double row suture anchor approach.

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