

ORIGINAL ARTICLE

Arthroscopic Repair of Large and Massive Tears in Rotator Cuff and its Consequences: a Longitudinal Retrospective Analysis Conducted in a Retrospective Manner

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ABSTRACT

Aim: Assessment of the consequences of arthroscopic repair of large and massive rotator cuffs.

Study design: Retrospective analysis

Place and duration: This study was conducted at Shaheed Zulifqar Ali Bhutto Medical University/PIMS Islamabad Pakistan from August 2020 to August 2021.

Methodology: In the current study, 50 patients were included out of which 37 patients had large tears and 13 had massive tears which were repaired arthroscopically. Average follow up was of 32 months. Modified UCLA shoulder rating scale was used to evaluate the function, strength, range of motion and the pain before and after surgery.

Results: Among the included 50 patients, 21 patients were female, and 29 were male. The range of their ages was between 41 and 76 years. The dominant extremity was affected in majority of patients. The average preoperative time of patients was 10 months. According to UCLA, 98% patients experienced satisfactory results, and only 1 patient had to undergo second surgery for the repair.

Conclusion: The study concluded that arthroscopic repair of tears in rotator cuffs is the best technique which can be used for repairing large and massive tears in rotator cuff.

Keywords: tears, outcome, arthroscopy, rotator cuff

INTRODUCTION

To keep the shoulder functioning properly, the muscles of rotator cuff play a very critical role which is why tears in rotator cuff cause severe shoulder pain and often a reason of disability.¹ In 1911, Codman conducted a surgical procedure for the first time to repair the full thickness tear in the tendon of rotator cuff. Since then it has been a topic of debate that whether the tears in the rotator cuff should be treated by surgical management or non-surgical management.² The debate was intensified when the idea of optimally treating the rotator cuff tears was developed. It was recommended by some surgeons that arthroscopy should not be the preferred method of treatment for treating the large and massive tears and an open approach should be used.³ However, in opting the open approach, one can encounter certain issues such as attaining the proper mobilization, and recognizing the patterns of tear in the rotator cuff.⁴ Whereas, the chronicity of tears and tear mobilization are the positive aspects of opting the arthroscopic techniques but due to certain advantages, some people still prefer simple decompression and debridement for the massive tears.⁵ This study was conducted in a retrospective manner to assess the outcomes of patients who had large massive tears in tendons of the rotator cuff and were treated with the arthroscopic repair and decompression.

METHODOLOGY

The current study was a retrospective analysis which included 50 patients who had massive and large tears in

the tendons of rotator cuff. Ethical review committee of the institute provided the permission to conduct this study. These tears in their rotator cuff were repaired arthroscopically. Defects or lesions in the cuff ranging from 3-5 cm at least 3 cm in length and width should be the minimum tear size in between at least two or more than two planes were considered as large tears whereas massive tears were defined as lesions which are greater than 5 cm in measurements. All the tendon ligaments must be ruptured till the glenoid. The inclusion criteria consisted of patients who had massive or large rotator cuff tears and were repaired completely by the arthroscopic technique and had a follow up of at least 12 months. Arthroscopic repair of the tear was assessed by the capability of tissue to hold the stitches and appropriately mobilizing the cuff till the tuberosity. It was also made sure that all these patients must have experienced distal clavicle excision and arthroscopic sub acromial decompression. Distal clavicle excision was routinely performed on every patient to get rid of the pain that could arise from a secondary source. The patients were treated conservatively which included physical therapy for at least 1 month (minimum for 3-6 months), anti-inflammatory medicines, symptomatic treatment via activity modification, and sub acromial injection of steroids. When non operative management, functional impairment, and extreme pain was observed continuously, surgery was performed. Pre and postoperative shoulder pain along with range of motion, strength, and function was evaluated by a modified UCLA shoulder rating scale. The maximum score observed was

35 which was further divided into poor (0-20), fair (21-27), good (28-33), and excellent (34-35) points. Excellent and good categories included the satisfactory or successful results. Patients' satisfaction was observed separately by simply asking them whether they were satisfied with the outcomes or not. The surgical technique used for repairing these tears was diagnostic arthroscopy of glenohumeral joint for identifying the tears associated with any kind of intraarticular abnormalities. Arthroscope was inserted in the sub acromial space forming a lateral portal. Debridement of the sub acromial space was conducted to have proper visualization of the tear and its acromial anatomy, and tears were clearly observed from the lateral and posterior portal. Initially, the rotator cuff was mobilized for the repair and using a full-radius shaver blade, the cuff was released on the capsular side with a surety that adhesions had also been released from the scapular spine. After which, the cuff was also released from the bursal side which included the release from coracohumeral ligament. This leads the creation of a bony trough in the greater tuberosity. Once the cuff is mobilized adequately enough, it facilitates a repair in the sub acromial decompression by resection of the distal clavicle. The massive crescent shaped tears were repaired by combining the main convergence sutures with suture anchors. Convergence sutures were placed first to lateralize tear's free margin and then suture anchors were placed laterally in the bony trough for repairing the cuff. Once the cuff is adequately mobilized, the tear pattern is identified and anatomic repair was obtained. SPSS version 22 was used for data analysis and P value of <0.05 was considered significant.

RESULTS

Out of the 50 patients, 29 were male, and 21 were female. The age range of the patients was between 41 and 76 years. Most of the patients had their right extremity affected. Average time duration of patients before surgery was 10 months as described in table number 1. Within one month of symptom onset, three patients were operated and had acute rotator cuff tears without any symptoms, while all the other tears were chronic. A medial retraction along with a posterior and anterior tendons displacement was observed in 47 patients who were treated with margin convergence suture combined with suture anchors in greater tuberosity. While the remaining three patients had a coronal split in the cuff and a posterior displacement in tendons. Such tears were managed by simply using the sutures for the posterior and anterior cuff with greater tuberosity. The average preoperative UCLA and pain score obtained was 15.3 ranging from 5-24, and 4.18 respectively, average preoperative function score was 5.22, average preoperative scores recorded for strength, and forward flexion were 2.84, and 2.8 respectively, and average preoperative maximum forward flexion is 81° ranging from 45-140° as given in Table number 2.

In the current study, during the average follow up of 32 months ranging from 12 to 63 months, 44 patients have excellent or good outcome observed by UCLA shoulder score. It was observed that the average UCLA was increased by an average of 17.1 points and was 32.4 post surgery. Pain scores were increased by 4.4 points to 8.6, functional scores were improved by 4 points to 9.24,

forward flexion was improved by 89-170°, and strength was improved by 2 points to 4.86. These scores indicated occasional or slight pain, almost normal function and normal strength. These results were statistically significant with a p value < 0.001. The results obtained of massive tears were not different from the results of large tears. Failure was observed in six patients out of which 4 had large tears and 2 had massive tears. However, only 1 patient was complained about dissatisfaction and was re-operated, the rest 49 patients were satisfied with the results.

Table 1: Demographic analysis of patients

Total number of patients	50
Number of male patients	29
Number of female patients	21
Minimum age of patients	41
Maximum age of patients	76
Average time duration before surgery	10 months
Average follow up duration	32 months
Acute rotator cuff tears	3 patients
Chronic rotator cuff tears	47 patients

Table 2: Results of the modified UCLA score

Characteristic	Score
Average preoperative UCLA	15.3
Average preoperative pain	4.18
Average preoperative function	5.22
Average preoperative strength	2.84
Average preoperative forward flexion	2.8
Average preoperative maximum forward flexion	81°
Average postoperative UCLA	32.4
Average postoperative pain	8.6
Average postoperative function	9.24
Average postoperative forward flexion	170°
Average postoperative strength	4.86

DISCUSSION

Repairing of large and massive rotator cuffs is a difficult task to perform because fatty degeneration is observed in the muscles and usually the tendons are retracted. Although, many surgeon have attempted to close the defects in the cuffs but the residual hole present in the rotator cuff is responsible for the unsuccessful results, which is why many techniques have been developed till date to overcome the residual defects.⁶ The techniques include free tendon transfer, implantation of fascial allograft or autograft tissue, transposition of the subscapularis tendon, repair of existing tendon, and simple decompression with debriding the rotator cuff.⁷ In different studies it was proved that a watertight closed rotator cuff is not required for a successful result by using imaging to observe defects after which open rotator cuff repair system can be used.⁸ In order to close large cuffs, some surgeons try to treat these tears by simple decompression and debridement without repairing. In majority of patients this treatment has proved satisfactory results with a significant improvement in the function and pain reduction but still, this process was preferred in some patients only, whereas the treatment method of openly repairing the cuffs was never abandoned as they suggested that repairing the cuffs is always required however, debridement can be conducted

on only the tears which are irreparable. It was observed that the tears which were managed only by debridement, they were deteriorated with time. A study performed by Montgomery et al., compared the debridement results with openly repaired cuffs and it was found out that the results of the latter group were significantly better than the former group.⁹ In a study it was suggested that tendon transposition should not be used to cover a defect as the shoulder mechanics are unfavorably altered in this condition.¹⁰ Bigliani et al., conducted a thorough review of several articles and reported that out of 61 patients who were treated with open repair system, 52 experienced satisfactory results.¹¹ Rokito et al., reported in his study that 23 patients (i.e. 77%) experienced satisfactory results. All these studies had used the traditional and classical open repair techniques.¹² In the current study 88% patients with both large and massive tears had experienced satisfactory results. Similarly improvements were observed in function, pain relief and shoulder strength after arthroscopic repair. Our findings were consistent with a study showing that a complete defect closure is not important for better results. Surgeons are taking interest in developing newer techniques for repairing the defects arthroscopically. Some studies reported that arthroscopic techniques are not useful for large and massive tears whereas, in our study it was reported that large and massive tears are not only repaired successfully via arthroscopic method but the results were equally satisfying as the results obtained by traditional open repair techniques. In our study, the results of large tears were equally satisfying as the results of massive tears.

CONCLUSION

It was concluded that arthroscopy is the best repair technique that can be used for repairing large and massive rotator cuff tears.

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Conflict of interest: None

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