Original Article

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Functional Outcome of Arthroscopic Rotator Cuff Repair-A Clinical Study

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Abstract

Background: Rotator cuff tear is among the most common condition affecting shoulder. The spectrum ranges from inflammation to massive tear. The goal of repair is to eliminate pain and improve function. Arthroscopic rotator cuff repair has been shown to be better than open rotator cuff repair.

Patient and Methods: From October 2015 to April 2017, 30 patients were selected to undergo arthroscopic rotator cuff repair. All patients were examined clinically and neurologically with history taking. Plain radiography and MRI were done for all patients. All operations were done under general anesthesia under lateral decubitus position. Evaluation of results of this study is based on the University of California at Los Angeles (UCLA) score, American Shoulder and Elbow Surgeon Score and Range of motion. Secondary outcome measures included a Visual Analogue Scale for pain.

Results: At the end of two years follow up, the average UCLA score was improved from preoperative score of 11.73 to postoperative score of 29.57. The average abduction was improved from 76 degrees preoperatively to 148 degrees postoperative. Secondary outcome measures showed that average Visual Analogue Scale for pain was worst possible pain preoperatively to no pain at all postoperatively at the end of the follow up period.

Conclusion: Arthroscopic rotator cuff repair is a procedure with good post-operative functional outcome and low complications rate based on a short term follow-up.

Keywords: arthroscopic rotator cuff repair, functional outcome.

Introduction

A few millimeters of humeral head translation occur during movement in the glenohumeral joint [2]. A functional rotator cuff contributes to the stability of this joint [1, 3, 4]. Some injuries are result of excessive, repetitive overhead motion such as swimming, tennis, pitching and weightlifting [3]. However, many occur with daily activities - household chores such as cleaning the windows and hanging curtains have been associated with shoulder injuries, especially so in the elderly[3]. Even in normal cadavers, most of them above 40 years of age, rotator cuff tears were found in 30% to 50% of specimens, suggesting that they may be part of the normal aging process [4, 5]. With an aging population, the number of patient visits for degenerative rotator cuff pathologies is expected to rise [6]. Regardless of the etiology, proper management of the rotator cuff disease is crucial for both physical function and wellbeing of the patient.

Recent advances in surgical techniques and implants used for arthroscopic rotator cuff repair have gained an interest in application of arthroscopic rotator cuff repair.

Traditional open rotator cuff repairs produce satisfactory results when used for the treatment of non-massive tears (<5 cm). However, this procedure has been associated with morbidity such as severe early postoperative pain, deltoid detachment and/or weakness and arthrofibrosis[7].Mini-open repairs were developed because they had the potential advantage of less deltoid morbidity and have demonstrated results that have been superior to those of open repairs but inferior to arthroscopic repair[7].

The potential advantages of arthroscopic procedure include global evaluation, smaller incision size (4-7 mm), mild postoperative pain, minimal surgical deltoid insult, an expedited postoperative phase, more rapid rehabilitation, ability to treat intra-articular lesions and less soft-tissue dissection. In the short and long term, the arthroscopic approach has shown promising results.8

The aim of this study was to evaluate functional outcomes of arthroscopic rotator cuff repair.

Materials And Methods

This study included 30 patients, which included 19 male and 11 female patients who were clinico-radiologically proven cases of rotator cuff tear from September 2015 to may 2017. All patients provided written informed consent for the study and for operation after conservative treatment failed to give satisfactory results. The average age at time of operation was 51.6 years (18-60 years).23 patients had right dominant handedness and affected extremity was also right. 7 patients had left handedness but only 2 had involvement of left extremity.26 patients had degenerative etiology while

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Table 1

	Pre-operative Range of Motion (Mean in degree)
Forward flexion	66
Abduction	76
Extension	25
External rotation	26

Table 2

	Post-operative Range of Motion (Mean in degree)
Forward flexion	145
Abduction	148
Extension	50
External rotation	50.5

remaining had traumatic etiology. Patients were put on shoulder immobilser immediately for small tears and an abduction pillow or abduction brace were given for moderate to massive tears,

Exclusion Criteria

1. Patients having associated shoulder lesions like SLAP, shoulder instability.
2. Revision rotator cuff repair.
3. Irreparable tear. (1 patient had irreparable tear and was excluded from study)
4. Associated symptomatic acromioclavicular arthritis.
5. Cuff tear arthropathy.
6. Any contraindication to surgery.

Preoperative Assessment

Range of motion and UCLA and ASES score were assessed and recorded preoperatively. Evaluation of X-rays was done in antero-posterior view in neutral rotation, internal rotation and supraspinatus outlet view to look for any cystic changes, bone density, osteoporotic changes, Acromio-humeral distance, osteophytes or sclerotic changes and findings were noted along with MRI of affected shoulder.

Surgical Technique

The patient was placed in the lateral decubitus position with the affected shoulder exposed. Examination under anesthesia was performed for passive range of motion. Manipulation was done in cases with limited passive range of motion. The affected shoulder was abducted 45 degrees and 15 degrees anteverted. Traction of 4-6 kg was applied to the affected limb. After painting and draping, bony landmarks, including the acromion, distal clavicle, acromioclavicular joint and coracoid process were outlined. A posterior portal was made in the soft spot between infraspinatus and teres minor muscles, 2-3 cm inferior and 1 cm medial to the postero-lateral tip of acromion. Anterior portal was established with the help of Wissinger rod after the posterior portal using an inside-to-out technique or with the help of needle. The lateral portal which is the primary operative portal for the subacromial space was made 3 cm lateral to the lateral border of the acromion passing through the deltoid muscle. The glenohumeral joint was examined for status of biceps tendon, status of labrum, synovitis, rotator cuff tears, loose bodies and signs of instability and findings were recorded. Rotator cuff was examined for whether it was full thickness tear or partial thickness tear. In case of partial thickness tear, depth of tear was noted. If depth was more than 6mm, rotator cuff repair was done and if depth was less than 6mm, then patient was excluded from study. Rotator cuff repair was done using titanium/PEEK anchor sutures which were double loaded. After single row repair double reo repair was done keeping mind that tissue was not under excessive tension. On completion, arm was put through a range of motion to make sure that there is no gapping of the anterior repair or impingement of the cuff on the acromion.

Postoperative Care

Intravenous antibiotics were administered for 2 days and analgesics were given in the immediate post-operative period. Pendulum exercises were started as pain was tolerable. Passive range of motion exercises of shoulder were continued till 6 weeks. Progressive active assisted range of motion exercises of shoulder were done between 6-12 weeks. Muscle strengthening exercises were started after 12 weeks. Patients were followed up at 1 month and 3 month and at every visit patients were evaluated according to the UCLA and ASES scale and Visual Analogue scale and patients were graded as excellent, good, fair or poor depending on the score obtained.ROM were recorded at each visit.(table 1)

Results

Mean preoperative duration of symptoms was 10.3 months.Intra-operatively 4 patients had full thickness tear with retraction, 4 had partial tear, 2 had intra substance tear and rest had full thickness tear. Mean post op UCLA score was 29.57.The mean post op ASES score was 92.65(92.65±3.32).Postoperatively, mean forward flexion was 144 degree, mean external rotation was 50.5 degree ,mean extension was 50 degree, mean abduction was 148 degree(table 2)

Discussion

Optimal repair of the rotator cuff includes achievement of high fixation strength, minimal gap formation and maintenance of mechanical stability under cyclic loading and proper healing of tendon to bone. In addition to adequate surgical repair, outcomes are dependent on appropriate rehabilitation. Despite reports of high satisfaction rates with open cuff repair, the open repair is associated with several disadvantages related to deltoid dysfunction and postoperative pain. Levy et al9, in order to circumvent the primary issues regarding deltoid takedown, described a technique of arthroscopically assisted rotator cuff repair in 1994. Arthroscopic assisted rotator cuff repair is a method of performing an arthroscopic subacromial decompression with repair of the rotator cuff through a

limited deltoid splitting approach. 25 patients with a minimum of 1 year follow-up were evaluated. Based on the UCLA shoulder rating, 80% of the patients were rated as excellent or good. There was significant improvement in pain, function, motion, and strength. Ninety-six percent of the patients were satisfied with the procedure. Of the patients with small or moderate size tears, 100% received a satisfactory rating. In its nascent stages, this "miniopen" technique used arthroscopy to perform a subacromial decompression and avoid deltoid takedown.

Mini-open and arthroscopic procedures were compared by Morse, who published in 2008 a meta-analysis of clinical trials comparing the results of the two approaches for rotator cuff repairs. He reported no difference in functional outcome scores or complications between the arthroscopic and mini-open repair groups. The ability to perform transosseous fixation is considered a possible advantage of mini-open surgery, although the author points out that new suture-anchor designs have allowed obtaining stronger fixation than transosseous tunnels. Stiffness and higher infection rate are advocated as potential drawbacks for miniopen surgery.10

Above data supports that the functional outcome of arthroscopic rotator cuff is excellent in terms of pain and range of motion. In our study, the functional scores improved significantly postoperatively.

Mean post op UCLA score was 29.57.The mean post op ASES score was 92.65(92.65±3.32).Postoperatively, mean forward flexion was 144 degree, mean external rotation was 50.5 degree ,mean extension was 50 degree, mean abduction was 148 degree.(table 2)

No serious complications were noted. Only 8 of the patients had scar pain and 1 had anchor pull-out. Rest of the patients did not have any significant complication. No other musculoskeletal complications, including neurological injuries and deep infections were reported. Points of strength of our study as 100% follow up; and range of motion assessment.

The limitations of this study were first: the deficiency of followup MRI scans to assess the integrity of the RC repairs was used. This was not possible because of the associated high costs and the patients refused due to feeling of good functions. The second limitation was short follow-up; however, as soft-tissue healing can be considered to be complete by 12 months would be a sufficient follow-up period. Re-tears not occurred in this study maybe due to the small number of cases included in this study and short follow up.

Conclusion

Arthroscopic rotator cuff repair is an excellent surgical treatment for rotator cuff repair of shoulder in selected patients resistant to conservative management.

We recommend the use of arthroscopic rotator cuff repair in all patients with clinical and radiological findings of rotator cuff tear, who are resistant to a course of conservative treatment for quicker and effective pain relief and rehabilitation.

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