A Study on Outcomes of Mini Open Procedures on Rotator Cuff Injuries

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ABSTRACT

Background: Many treatment options exist for the management of rotator cuff tears, varying from non-operative-benign neglect to complex arthroscopic partial repair using an interval slide technique. Although satisfactory results may be obtained with many of these options, it should be remembered that few prospective, randomized trials exist comparing these treatments. Thus, controversy remains as to the absolute indications for each, and individual patient factors may significantly affect the final treatment decision.

Methods: Hospital-based observational study. Informed consent was taken from the patients. A total of 30 patients who got admitted to the Department of Orthopaedics, Government General Hospital, Kakinada from November 2018 to September 2020 were included in the study.

Results: Twenty five cases showed excellent results four cases showed good results and one case showed poor result using University of California Los Angeles shoulder scale. Twenty nine cases showed excellent results and one case showed good result with Constant Murley Score.

Conclusion: In the era of arthroscopic rotator cuff surgery the mini open technique with open acromio plasty and rotator cuff repair adds to rural surgeon as an elective procedure and can produce clinically competing results that of other contemporary techniques.

Keywords:
Rotator cuff D017006, Shoulder joint D012785, Arthritis D001168, Range of Motion (ROM)

Introduction

Traditional treatment of full-thickness tears of the rotator cuff consisted of open surgical repair with 70% to 95% satisfactory outcome. Repair of the rotator cuff was first described by Codman over a century ago. The current practice trend is Mini-Open (MO) repair which has been regarded as the gold standard for rotator cuff tear repair for decades. It has been proved to achieve good to excellent results in 90% of patients. It was the first choice for many surgeons due to its stronger suture fixation and shallow learning curve. The goal of rotator cuff repair is to improve shoulder function with increased shoulder Range of Motion (ROM) and to eliminate pain. In addition to adequate surgical repair, outcomes are dependent on appropriate rehabilitation. Successful post-operative management following rotator cuff repair is dependent on several variables, including surgical intervention method, patient age, chronicity of tear, tear size and activity level. With rapidly advancing modes of fixation and surgical techniques, optimal rehabilitation following rotator cuff surgical repair has become important and challenging for the orthopedic surgeon and physical therapist. One of the main advantages of the mini-open rotator cuff repair is deltoid preservation, thereby eliminating the risk of postoperative deltoid dehiscence.

Aim and Objectives

Aim: To evaluate the clinical outcomes and assess the effectiveness of the mini-open procedure for patients with rotator cuff injuries.

Objective: To evaluate the functional outcomes of rotator cuff injuries operated with a mini-open procedure using UCLA and CMS scoring systems.

Material and Methods

Surgical Procedure

All the cases were operated under general anesthesia and in supine position with sandbag underneath the shoulder. Surgical approach was anterolateral deltoid splitting after identifying the bony landmarks (acromion), a straightskin incision of 3-5 cm given from the lateral border of the acromion on the anterolateral aspect of the shoulder. Subcutaneous fat and deltoid fascia divided, deltoid muscle split in the line of fibers for 3-5 cm. Subacromial bursa resection and decompression performed. Under direct visualization of rotator cuff tendons tear identified, debridement done. Preparation of the footprint over the bone is performed. Mobilization of tendons to the footprint was done and fixed with Ethibond and suture anchors trans osseously with a gap of at least 1.5 to 2 cm between the suture anchors. Suture technique may be a simple or locking stitch if the quality of the tendon is not good. Movements and fixation checked. Deltoid muscle repaired with intermittent stitch if the quality of the tendon is not good.
Inclusion Criteria

- Patient in the age group of 18-60 years of age
- Patient undergoing the mini-open procedure for rotator cuff injury
- Patient accepting a minimum of 6 months follow up after surgery

Exclusion Criteria

- Patient refusal
- Age less than 18 and more than 60 years
- History of diabetes and severe metabolic comorbidities
- Glenohumeral instability or restricted glenohumeral movements a result of adhesive capsulitis
- Glenohumeral arthritis
- Rheumatoid arthritis
- History of acute trauma to the shoulder
- History of previous shoulder surgery

Results

In this study, two cases (6.6%) were in the age group of 20-30 years. Six cases (20%) were in 31-40 years, fourteen cases (46.6%) were 41-50 years, and eight cases (26.6%) were 51-60 years. The majority of patients were between age 41-50 years age group. The mean age was 44.2 years. In the current study, no. of male patients were 28 and females were two. Out of 32 patients, 20 injured their shoulders due to unspecified falls, 6 due to road traffic accidents, and 4 due to assault. Most of them were daily laborers. Jobes test was positive in all cases. The majority of patients complained of inability to lift the shoulder following trauma. All the cases taken into the study were full-thickness tears. Acromioplasty and subacromial decompression provided better pain relief postoperatively and it was helpful in physiotherapy. We performed acromioplasty in every case to prevent further impingement and occurrence of re-tears. Out of thirty shoulders that underwent mini-open repair, 28 cases showed significant improvement with a decrease in pain, and 2 cases had mild pain on strenuous activities. Postoperatively range of movements was good except for a slight decrease in abduction compared to the normal side at 6 weeks and 3 months follow up, but by the end of 6th month, they attained a range of movements as that of the normal side. The mean values of preoperative and postoperative Range of motion of the affected shoulder were listed in the Table 1.

There is a significant improvement in the active ROM at 6 months follow up. Activities of daily living and strength and power of muscles are assessed and scored in UCLA and CMS scores. In the current study, one case had developed limitation of ROM to less than 90 degrees of abduction, remaining all the cases are without any complications at 6 months of follow up.

Discussion

The gold standard treatment of symptomatic full-thickness rotator cuff tears as described by Codman has been open rotator cuff repair [1]. Klepp, et al. and others have documented the validity and reproducibility of this procedure [2]. Although good results were seen with open rotator cuff repair, prolonged rehabilitation and significant morbidity have been associated with the requisite deltoid take-down and repair [3]. The mean age of the present study was the youngest of the compared studies listed in Table 2.

In the current study, the mean UCLA Score was 34.43 when compared to other studies Kose, et al. (5) and Youm, et al. (7) were 28.8 and 32.3, respectively Table 4.

<table>
<thead>
<tr>
<th>Category</th>
<th>Preoperative value degrees</th>
<th>Postoperative value degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward flexion</td>
<td>88</td>
<td>153</td>
</tr>
<tr>
<td>Abduction</td>
<td>79</td>
<td>154</td>
</tr>
<tr>
<td>External rotation</td>
<td>42</td>
<td>78</td>
</tr>
<tr>
<td>Internal rotation</td>
<td>44</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 1: Comparison of ROM.

<table>
<thead>
<tr>
<th>Study</th>
<th>Mean age years</th>
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</thead>
<tbody>
<tr>
<td>Stone, et al. (4)</td>
<td>62</td>
</tr>
<tr>
<td>Kose, et al. (5)</td>
<td>62</td>
</tr>
<tr>
<td>Liem, et al. (6)</td>
<td>62.1</td>
</tr>
<tr>
<td>Youm, et al. (7)</td>
<td>59</td>
</tr>
<tr>
<td>Current study</td>
<td>44.2</td>
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</tbody>
</table>

Table 2: Mean age of various studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Mean age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kose, et al. (5)</td>
<td>28.8</td>
</tr>
<tr>
<td>Youm, et al. (7)</td>
<td>32.3</td>
</tr>
<tr>
<td>Current study</td>
<td>34.43</td>
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</tbody>
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Table 3: Mean follow up in months.

<table>
<thead>
<tr>
<th>Study</th>
<th>UCLA score</th>
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</thead>
<tbody>
<tr>
<td>Kose, et al. (5)</td>
<td>28.8</td>
</tr>
<tr>
<td>Youm, et al. (7)</td>
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<tr>
<td>Current study</td>
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Table 4: UCLA score compared.
women [10]. They did not add acromioplasty as decompression procedure.

**Limitations**

The current study spanned in a very short period; hence the long-term results and complications are compromised. The study sample is small (n=30), so the results cannot be applied to the larger population.

**Conclusion**

In the era of arthroscopic rotator cuff surgery the mini open technique with open acromioplasty and rotator cuff repair adds to rural surgeon as an elective procedure and can produce clinically competing results that of other contemporary techniques.

**Conflict of Interest**

The author has no known conflict of interest to disclose.

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No.

**References**