

## Assessment of functional outcome among patients undergoing open rotator cuff repair at tertiary care hospital

Anurodh Shandilya<sup>1\*</sup>, Vinod Kumar Nagar<sup>2</sup>, Bhanu Pratap<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Orthopedics, Pacific Medical College, Bhillo Ka Bedla, Udaipur, Rajasthan, India

<sup>2</sup>Assistant Professor, Department of Orthopedics, Pacific Medical College, Bhillo Ka Bedla, Udaipur, Rajasthan, India

<sup>3</sup>Assistant Professor, Department of Orthopedics, Pacific Medical College, Bhillo Ka Bedla, Udaipur, Rajasthan, India

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### Abstract

**Background:** Shoulder pain is the commonest presenting complaint among patients having rotator cuff tear. Progressive and degenerative changes are important contributing factors in etiopathogenesis of rotator cuff injury. The degenerative changes increase with increase in age and are an important contributing factor to rotator cuff injury among old aged people. **Material & Methods:** The present cross sectional study was conducted at department of Department of orthopedics in a private medical college. The study duration was from September 2018 to September 2019. The study group comprised of 50 patients (age 32 to 65 years), with partial and full thickness rotator cuff tear who were undergoing surgery for open rotator cuff repair. **Results :** Study included 50 patients with an average age of 46.7 years with 26 patients (52 %) male and 24 patients (48 %) female patients with the average BMI 26.4 kg/m<sup>2</sup>. On the basis of side and degree of rotator cuff tear, 31 patients (62 %) had right sided rotator cuff tear. Out of them 19 (61.3%) had complete right sided rotator cuff tear and 12 (38.7%) had partial right sided rotator cuff tear. 19 patients (38 %) had left sided rotator cuff tear, out of them 10 (52.6%) had complete left sided rotator cuff tear and 09 (47.4%) had partial left sided rotator cuff tear. Mean pre-op constant score was  $35.31 \pm 7.83$  with highest score of 49.1 and lowest score of 19.7. Mean constant score at 3 months follow-up was  $61.42 \pm 7.98$  with range from 43.7 to 78.6. Mean constant score at 6 months post-surgery follow-up was  $76.48 \pm 8.24$  with least score of 58.9 and highest score of 92.4. On applying test of significance in pre-op Constant-Murley score and post-op Constant Murley score after 6 months post-surgery follow-up by paired sample t test, it was found to be significant association with t value of 31.352 and p value of <0.05. **Conclusion:** To conclude the majority of the study participants -with rotator cuff was significant increment in Constant Murley score following a half year in patients treated by open rotator cuff repair with statistically significant result.

**Key words:** Open rotator cuff repair, Rotator cuff tear, Functional outcome.

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### Introduction

Various operative techniques have been reported in

\*Correspondence

**Dr. Anurodh Shandilya**

Assistant Professor, Department of Orthopedics,  
Pacific Medical College, Bhillo ka Bedla,  
Udaipur, Rajasthan, India

E-mail: [anurodh\\_s2002@yahoo.com](mailto:anurodh_s2002@yahoo.com)

treating cases of patients with rotator cuff tears. Majority of patients with rotator cuff tears presented with shoulder pain [1]. In these studies, various operative procedures were reported in the treatment of rotator cuff tears which included open repair of rotator cuff tears, complete arthroscopic rotator cuff repair (ARCR) and arthroscopically assisted mini-open rotator cuff repair (MRCR) [2]. Several studies across the world have compared various modalities of

treatment used for treatment of rotator cuff tear. The commonly used modalities are open repair of rotator cuff tears, complete arthroscopic rotator cuff repair and arthroscopically assisted mini-open rotator cuff repair, the functional outcomes with various modalities of treatment have been compared [3]. The presenting complaint among patients having rotator cuff tears is shoulder pain [4]. The etiopathogenesis of rotator cuff tears reported in previous studies is progressive and degenerative changes which are increased in incidence with increasing age and sometimes these degenerative changes lead to partial rotator cuff tear which progresses to complete rupture of the rotator cuff [5]. Rotator cuff tear repair is among one of the most common operative procedures conducted for the shoulder joint pathology [6]. However, surgical interventions for chronic rotator cuff tears are only indicated when conservative non-operative treatment does not relieve the symptoms [7]. The most common operative procedures conducted for rotator cuff repair are traditional open repair, complete arthroscopic rotator cuff repair and arthroscopically assisted mini-open rotator cuff repair. The traditional open repair and arthroscopically assisted mini-open rotator cuff repair operative procedures are frequently performed in many centers, however complete arthroscopic rotator cuff repair is now being performed for rotator cuff tears [8]. Recent studies have reported that arthroscopic operative procedures conducted for rotator cuff repair are now being used to repair even large rotator cuff tears and also being used to mobilize retracted tears [9]. The present study was conducted to assess the functional outcome among patients undergoing open rotator cuff repair at our tertiary care hospital.

## Materials & methods

The present cross sectional study was conducted at Department of orthopedics at a private medical college. The study duration was from September 2018 to September 2019. The study group comprised of 50 patients (age 32 to 65 years), with partial and full thickness rotator cuff tear who underwent surgery for rotator cuff repair, the study group comprised of patients from different parts of Rajasthan and also some from the states like Gujarat and Madhya Pradesh. The patients with fractures around the shoulder joint were excluded from the study. Prior permission from institutional ethic committee was obtained.

Demographic data including age, sex, BMI, side and degree of tear, hypertension and diabetic status were recorded in a predesigned Performa. Constant and Murley scoring system was applied for pre-operative

and post-operative score of the shoulder. The shoulder with rotator cuff tear was scrubbed and after surface markings, 4-6 cm incision conducted lateral to the anterior acromion toward the coracoid. 10 ml of 1:50000 adrenaline used for infiltration to minimize the bleeding. Raphe between anterior deltoid and middle deltoid was split after mobilization of subcutaneous tissue. A flap of deltoid muscle was elevated around 2cm along with periosteal attachment of the deltoid and trapezius. After that coracoacromial ligament was resected applying electro-cautery. With the exposure of subacromial space, the bursa with its all adhesions and soft tissues were removed from acromial under surface. Acromioplasty was conducted by an osteotome and the portion of the acromion were removed after that all edges were smoothed by a rasp and rotator cuff tear was identified. Blunt probe or a finger was used to mobilize the cuff posteriorly with the infraspinatus and anteriorly to supraspinatus, blunt probe releases the adhesions from in and outside of the joint. Capsule was incised from its insertion to the glenoid labrum only in case of mobilization of tendons was not achieved for adequate length due to the retraction of the supraspinatus and infraspinatus tendons. An osteotome was used to create shallow trough along with greater tuberosity of the running length of the exposed bone which helps in accommodating the supraspinatus and infraspinatus tendons. After that a rasp was used for beveling the proximal edge and ethibond sutures were applied using single row technique. All debris were removed from the subacromial space and deltoid was sutured with periosteum. Hemostasis was attained. After the open rotator cuff tear repair surgery arm was immobilized in an abduction splint in 30-degree abduction. The splint was advised to worn continuously for six weeks, except during physiotherapy and bathing. Patients were followed up at three months and six months post-surgery. The functional outcome assessment was conducted based on pain relief, strength, ability to conducting routine activities and patient satisfaction. The test of significance was utilized to decide the measurable centrality of the information by applying the chi-square test and t test at 95% confidence interval. P value less than 0.05 was considered as statistically significant association.

## Results

The present study group comprised of 50 patients (age 32 to 65 years), with partial and full thickness rotator cuff tear who were undergoing open rotator cuff repair. Study included 50 patients with the average age of 46.7 years with 26 patients (52 %) male and 24 patients (48

%) female patients with the average BMI 26.4 kg/m<sup>2</sup>. On the basis of side and degree of rotator cuff tear, 31 patients (62 %) had right sided rotator cuff tear. Out of them 19 (61.3%) had complete right sided rotator cuff tear and 12 (38.7%) had partial right sided rotator cuff

tear. 19 patients (38 %) had left sided rotator cuff tear, out of them 10 (52.6%) had complete left sided rotator cuff tear and 09 (47.4%) had partial left sided rotator cuff tear. (Table 1)

**Table 1: Distribution of study subjects according to the study parameters**

Age	Mean 46.7 Years
Sex	
Male	26 patients (52 %)
Female-	24 patients (48 %)
Body Mass Index(kg/m <sup>2</sup> )	Mean -26.4 kg/m <sup>2</sup>
Side and degree of tear	
Right side	31 patients (62 %)
Complete	19 (61.3%)
Partial	12 (38.7%)
Left side	19 patients (38 %)
Complete	10 (52.6%)
Partial	09 (47.4%)

In the present study, on the assessment of all study participants the mean pre-op constant score was 35.31 ± 7.83 with highest score of 49.1 and lowest score of 19.7. The mean constant score at 3 months follow-up was 61.42 ± 7.98 with range from 43.7 to 78.6. The mean constant score at 6 months post-surgery follow-up was 76.48 ± 8.24 with least score of 58.9 and

highest score of 92.4. On applying test of significance in pre-op Constant-Murley score and post-op Constant Murley score after 6 months post-surgery follow-up by paired sample t test, it was found to be significant association with t value of 31.352 and p value of <0.05. (Table 2).

**Table 2: Preoperative and 6 months postoperative constant score wise distribution of study subjects**

	Mean	Std. deviation	t score	P value
Pre-op CS	35.31	7.83	31.352	<0.05
Post-op CS (after 6 months)	76.48	8.24		

## Discussion

The present study group comprised of 50 patients (age 32 to 65 years), with partial and full thickness rotator cuff tear who underwent surgery for rotator cuff repair. Study group included 50 patients with the average age of 46.7 years with 26 patients (52 %) male and 24 patients (48 %) female patients with the average BMI 26.4 kg/m<sup>2</sup>. Similar results were obtained in a study conducted by Savio A et al among 26 patients of rotator cuff tear who were undergoing open rotator cuff repair. They reported majority of the study participants were males 53.8% and 46.2% were females. Out of total study participants highest number of patients 42.3% were in the age group of 51-60 years followed by 35.8% patients in the age group of 41-50 years [10]. Similar results were obtained in a study conducted by

Vikram D et al among 22 patients of rotator cuff tear who were undergoing open rotator cuff repair. They reported majority of the study participants were males. Out of total study participants highest number of patients were in the age group of 51-60 years followed by patients in the age group of 41-50 years[11]. In present study, on the basis of side and degree of rotator cuff tear, 31 patients (62 %) had right sided rotator cuff tear. Out of them 19 (61.3%) had complete right sided rotator cuff tear and 12 (38.7%) had partial right sided rotator cuff tear. 19 patients (38 %) had left sided rotator cuff tear, out of them 10 (52.6%) had complete left sided rotator cuff tear and 09 (47.4%) had partial left sided rotator cuff tear. Similar results were obtained in a study conducted by Vamsinath P et al

among patients of rotator cuff tear who were undergoing rotator cuff repair. They reported majority of the study participants had partial thickness rotator cuff tears (59.1%) and 40.9% patients had full thickness rotator cuff tears. 81.8 % study participants had traumatic tears and 18.2% study participants had degenerative tears [12]. Similar results were obtained in a study conducted by Khoo S et al among patients of rotator cuff tear who were undergoing rotator cuff repair. They reported majority of the study participants had right sided shoulder pathologies. Majority of patients had full thickness rotator cuff tears [13].

In the present study, on the assessment of all study participants the mean pre-op constant score was  $35.31 \pm 7.83$  with highest score of 49.1 and lowest score of 19.7. The mean constant score at 3 months follow-up was  $61.42 \pm 7.98$  with range from 43.7 to 78.6. The mean constant score at 6 months post-surgery follow-up was  $76.48 \pm 8.24$  with least score of 58.9 and highest score of 92.4. On applying test of significance in pre-op Constant-Murley score and post-op Constant Murley score after 6 months post-surgery follow-up by paired sample t test, it was found to be significant association with t value of 31.352 and p value of  $<0.05$ . Similar results were obtained in a study conducted by N Prasad et al among 42 patients of rotator cuff tear who were undergoing open rotator cuff repair. They reported study participants with massive rotator cuff tear, increase in the mean postoperative Constant score was statistically less significant compared study participants with moderate and small tears ( $p < 0.001$ ). In patients who aged more than 60 years, improvement in postoperative Constant score was statistically less significant compared to the patients age less than 60 years ( $p < 0.01$ ). The postoperative Constant score significantly improved from the preoperative score among all study participants ( $p < 0.001$ ). There was a statistically negative correlation with age of the patient and size of cuff tear, Constant-Murley score [14]. Similar results were obtained in a study conducted by Matthias A et al among 23 patients of rotator cuff tear who were undergoing open rotator cuff repair. They reported mean relative Constant score was 85% in comparison with 83% at 3 years. Study participants with an intact repair had showed better result than those with failed reconstruction, the mean absolute Constant score ( $p = 0.015$ ), mean relative Constant score ( $p = 0.002$ ) [15].

### Conclusion

We concluded from the present study that majority of the study participants with rotator cuff tears were of male gender with right sided rotator cuff tears and were

in the post middle age group. There was significant increase in Constant Murley score in six months post surgery. Open rotator cuff repair actually remains as a compelling treatment for both partial and complete rotator cuff tears and doing acromioplasty during the surgery adds to better results post-operatively.

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