

EVALUATING THE LONG-TERM FUNCTIONAL OUTCOMES OF NON-OPERATIVE TREATMENT FOR ROTATOR CUFF TEARS: A PROSPECTIVE OBSERVATIONAL STUDY

Pradeep Chandra Chetamoni¹, Bokka Sudheer Kumar², V Shivram Naik³, V Yeshwant Naik⁴

¹Associate Professor, Department of Orthopaedics, Government Medical College, Sanga Reddy Telangana, India

²Associate Professor, Department of Orthopaedics, Osmania Medical College and Hospital, Hyderabad, Telangana, India

³Associate Professor, Department of Orthopaedics, Osmania Medical College and Hospital, Hyderabad, Telangana, India

⁴Post Graduate, Department of Orthopaedics, Osmania Medical College and Hospital, Hyderabad, Telangana, India

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Corresponding Author:

Dr. V Shivram Naik,
Email: shivramnaik.v@gmail.com

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Abstract

Background: Rotator cuff tears are a common shoulder injury, affecting a broad range of age groups, with origins varying from lifestyle-related activities to degenerative changes. This study evaluates the long-term functional outcomes of non-operative treatment in patients with rotator cuff tears. **Materials and Methods:** Conducted as a prospective observational study, the participant demographic was varied. It included young adults (20-40 years) who made up 20% of the sample, predominantly experiencing sports or activity-related injuries. Middle-aged adults (41-60 years), accounting for 40%, likely faced age-related degenerative changes. The older adult group (over 60 years) also constituted 40%, suggesting the impact of cumulative wear and tear. The study observed a slight male predominance (55% male, 45% female), which may indicate either a higher incidence of rotator cuff injuries in men or differences in seeking medical care based on gender. **Result:** The severity of pain among participants varied, with 25% experiencing mild pain, 50% moderate, and 25% severe. Functional limitations mirrored this distribution, with 30% mild, 45% moderate, and 25% severe, indicating the varied impact on daily activities. The prevalence of partial tears (60%) was higher than full-thickness tears (40%). Additionally, the presence of comorbid conditions was noteworthy, with 40% of patients having no comorbidities, 35% with one, and 25% with multiple, underscoring the importance of considering overall health in managing rotator cuff tears. **Conclusion:** The study highlights the diverse demographic and clinical profiles of patients with rotator cuff tears, the varying degrees of pain and functional limitations, and the significant role of comorbidities. These findings are essential for tailoring individualized, non-operative treatment approaches.

INTRODUCTION

Rotator cuff tears are a prevalent musculoskeletal injury, with a significant impact on both individual patients and the healthcare system.^[1] These injuries, involving the rupture or tear of one or more tendons of the rotator cuff muscles in the shoulder, are commonly seen in various age groups and can result from a wide range of causes.^[2] The complexity and multifactorial nature of rotator cuff tears make their management a challenging aspect of orthopaedic and sports medicine.^[3]

The rotator cuff, a group of muscles and tendons that surround the shoulder joint, plays a crucial role in stabilizing the shoulder and enabling a wide range of movements.^[4] The integrity of this structure is vital for the effective functioning of the shoulder.^[5] However, it is susceptible to injuries, which can range from minor strains to complete tears.^[6] The causes of rotator cuff tears are multifaceted, including acute trauma, repetitive overhead activities, degenerative changes, and reduced blood supply to the tendons with aging.^[7] These injuries are more common in older adults due to degenerative changes in the tendon tissue, but younger individuals

are not immune, particularly those engaged in sports or occupations involving repetitive shoulder movements.^[8]

The symptoms of a rotator cuff tear can vary greatly depending on the severity and cause of the injury. They often include pain, especially with overhead activities, weakness in the arm, and sometimes a noticeable crackling sensation with shoulder movement. The severity of symptoms and their impact on daily life can range widely among individuals, influencing the choice of treatment.

Treatment for rotator cuff tears can be broadly categorized into operative and non-operative methods. Surgical intervention is often considered for complete tears or when non-operative treatments fail to provide relief. However, surgery carries risks and necessitates a considerable recovery period. Consequently, non-operative treatments, including physical therapy, pain management, and activity modification, are frequently the first line of management, especially for partial tears or in patients with higher surgical risks.

Despite the frequency of non-operative treatment, there is a need for a deeper understanding of its long-term effectiveness. This gap in knowledge is particularly relevant given the diverse patient population affected by rotator cuff tears, which includes different age groups with varying activity levels, pain perceptions, functional demands, and the presence of comorbidities. A comprehensive assessment of the long-term outcomes of non-operative treatment is crucial to guide clinical decision-making, patient counselling, and healthcare policy.

The current study, therefore, aims to fill this gap by evaluating the long-term functional outcomes of non-operative treatment for rotator cuff tears. It seeks to understand how different demographic groups respond to such treatment and the influence of factors like pain severity, functional limitations, and comorbidities on treatment outcomes. By doing so, the study intends to provide a more nuanced understanding of the effectiveness of non-operative treatments and aid in the development of tailored treatment strategies for individual patients. The primary objectives of this study are to assess the long-term impact of non-operative treatment on pain severity and functional limitations in patients with rotator cuff tears and to explore how these outcomes vary with patient demographics and the presence of comorbidities.

MATERIALS AND METHODS

Study Setting and Duration: This study was conducted at Osmania Medical College and Hospital in Hyderabad. The research spanned a period of one year, from July 2022 to June 2023. Osmania Medical College and Hospital, being a prominent medical institution in the region, provided a suitable setting

for such a study due to its diverse patient population and comprehensive medical facilities.

Study Design: A prospective observational study design was employed to evaluate the long-term functional outcomes of non-operative treatment for rotator cuff tears. This design was chosen to allow for the collection of real-time data and to observe the progress of patients over the study period.

Participants: The study included patients who were diagnosed with rotator cuff tears and opted for non-operative treatment. The inclusion criteria were: patients of any gender and age with a confirmed diagnosis of a rotator cuff tear, as verified by clinical examination and appropriate imaging studies (such as MRI or ultrasound). Patients who had undergone previous shoulder surgery, those with acute traumatic shoulder injuries, and those opting for surgical intervention were excluded from the study.

Data Collection: Data were collected through patient interviews, clinical examinations, and review of medical records. Key variables included demographic data (age, gender), the severity of the rotator cuff tear (partial or full-thickness), pain severity, functional limitations, and the presence of comorbid conditions. Pain severity and functional limitations were assessed using validated scales and questionnaires.

Treatment Protocol: The non-operative treatment regimen typically included physical therapy, pain management (such as NSAIDs or corticosteroid injections), and lifestyle or activity modifications. The specifics of the treatment were tailored to each patient based on the severity of the tear, pain levels, functional requirements, and overall health status.

Follow-Up: Patients were followed up regularly over the course of the year to assess their progress. Follow-up assessments included evaluations of pain severity, shoulder function, and any changes in the treatment regimen. This follow-up period allowed for an assessment of the long-term outcomes of the non-operative treatments.

Data Analysis: The collected data were analysed to assess the outcomes of non-operative treatment in terms of pain relief, improvement in shoulder function, and overall patient satisfaction. The analysis also examined the impact of various factors like age, gender, severity of the tear, and comorbidities on treatment outcomes. Statistical methods, including descriptive statistics and inferential analyses, were used to interpret the data and draw conclusions.

Ethical Considerations: The study was conducted in strict adherence to ethical principles, guided by the Declaration of Helsinki. Ethical approval was duly obtained from the Institutional Ethics Committee at Osmania Medical College. This ensured the protection of participants' rights, privacy, and the strict maintenance of confidentiality.

RESULTS

Demographic Distribution: The study's demographic analysis revealed a broad age distribution among patients with rotator cuff tears, indicative of both lifestyle-related and degenerative causes. The age breakdown was as follows: young adults aged 20-40 years comprised 20% of the patient population, likely reflecting injuries related to sports or physical activities. Middle-aged adults, ranging from 41-60 years, constituted 40%, suggesting the onset of age-related degenerative changes in the rotator cuff. The older adult group, aged over 60 years, also accounted for 40% of the patients, pointing towards a significant prevalence in this age group, potentially due to cumulative wear and tear. Gender-wise, there was a slight male predominance, with males representing 55% of the patients and females 45%. This distribution could be indicative of a higher incidence of rotator cuff injuries in men, or it might reflect gender differences in seeking medical care for shoulder problems.

Baseline Characteristics: Pain and Function

The severity of pain experienced by patients was distributed across three categories: 25% of patients reported mild pain, 50% moderate pain, and the

remaining 25% severe pain. This distribution underscores the varied impact that rotator cuff tears can have on individual patients.

In terms of functional limitations, the data also showed a diverse impact on daily activities, with 30% of patients experiencing mild limitations, 45% moderate limitations, and 25% severe limitations. These findings highlight the need for individualized treatment approaches tailored to the specific needs of each patient.

Severity of Rotator Cuff Tears

The analysis of the severity of rotator cuff tears showed that 60% of the patients had partial tears, while 40% had full-thickness tears. This distribution suggests a tendency for patients with less severe injuries to opt for non-operative treatments.

Comorbidities

Regarding the presence of comorbid conditions, the data revealed that 40% of the patients did not have any comorbidities, 35% had one comorbidity, and 25% had multiple comorbidities. This aspect of the patient profile emphasizes the importance of considering the overall health status in the management of rotator cuff tears, as a significant portion of patients may have complex medical needs influencing both their treatment choices and outcomes.

Table 1: Demographic Distribution of Study Participants

Demographic Factor	Category	Percentage	Number of Patients
Age Distribution	20-40 years	20%	20/100
	41-60 years	40%	40/100
	Over 60 years	40%	40/100
Gender Distribution	Male	55%	55/100
	Female	45%	45/100

Table 2: Baseline Characteristics - Pain and Function

Characteristic	Category	Percentage	Number of Patients
Pain Severity	Mild	25%	25/100
	Moderate	50%	50/100
	Severe	25%	25/100
Functional Limitations	Mild	30%	30/100
	Moderate	45%	45/100
	Severe	25%	25/100

Table 3: Severity of Rotator Cuff Tears

Severity of Injury	Percentage	Number of Patients
Partial Tears	60%	60/100
Full-Thickness Tears	40%	40/100

Table 4: Comorbidities Among Participants

Comorbidity Status	Percentage	Number of Patients
No Comorbidities	40%	40/100
One Comorbidity	35%	35/100
Multiple Comorbidities	25%	25/100

DISCUSSION

The findings of this study provide valuable insights into the demographic profile and baseline characteristics of patients with rotator cuff tears

opting for non-operative treatment, and underscore the multifaceted nature of this condition.

Age and Gender Distribution

Consistent with findings by Boorman et al,^[14] (2018) and Lee et al (2016),^[17] our study demonstrated a

wide age range of patients affected by rotator cuff tears. The significant representation of both middle-aged and older adults aligns with the suggestion by Silva et al,^[8] (2017) that these injuries can result from both acute incidents in younger populations and degenerative processes in older individuals. The prevalence of these injuries among young adults (20%), often associated with sports or high-demand activities, echoes observations made by De Carli et al,^[15] (2017) and Fabbri et al (2016).^[16] The slight male predominance observed in our study is in line with the findings of Yoo et al (2018),^[18] suggesting a possible gender disparity in the incidence of these injuries or in seeking treatment.

Pain Severity and Functional Limitations

Our study's observations regarding pain severity and functional limitations corroborate the findings of Lambers Heerspink et al (2015) and Kukkonen et al (2014).^[10,11] The presence of a significant proportion of patients with moderate to severe pain and functional limitations underscores the impact of rotator cuff injuries on quality of life, as highlighted by Moosmayer et al (2014, 2019).^[12,13] This emphasizes the necessity for effective management strategies and personalized treatment plans, a perspective supported by Beaudreuil et al (2010).^[9]

Severity of Rotator Cuff Tears: The higher incidence of partial tears in our study supports the trend towards non-operative management in less severe cases, as noted in the works of Moosmayer et al,^[12,13] (2014, 2019) and Lambers Heerspink et al (2015).^[10] This finding aligns with current treatment guidelines which often recommend non-operative management as an initial approach, particularly for partial tears or patients with higher surgical risks.

Comorbidities: The presence of comorbid conditions in a significant portion of our study population echoes the need for a holistic approach to treatment, as emphasized by Lee et al,^[17] (2016) and Fabbri et al (2016).^[16] Managing rotator cuff tears in patients with comorbidities requires a comprehensive approach, addressing not only the shoulder pathology but also the overall health status of the patient. This aspect of care is crucial for ensuring optimal outcomes and in tailoring treatment strategies to individual patient needs, a perspective that is well-supported by the studies of Boorman et al (2018) and Yoo et al (2018).^[14,18]

CONCLUSION

This research enhances the existing body of knowledge by highlighting the intricate nature of rotator cuff tears and the wide range of patient demographics affected by this condition. The findings highlight the importance of individualized treatment approaches, taking into consideration factors such as age, gender, severity of injury, pain levels, functional limitations, and comorbidities. Further research is needed to explore the long-term outcomes of non-operative management and to

develop tailored treatment strategies that can improve the quality of life for patients suffering from rotator cuff tears.

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