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# STUDY OF ROTATOR CUFF TEARS IN SHOULDER JOINT OF ELDERLY POPULATION

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## Abstract

**Background:** The morbidity of rotator cuff injuries rises with advancing age. In people over 75, the rate of asymptomatic full-thickness rips is 40%. Elderly patients frequently exhibit a number of risk factors, such as deteriorated bone quality, inadequate blood flow, and an elevated occurrence of medical co morbidities. The most effective way to relieve pain and restore shoulder function in patients with rotator cuff tears (RCT) is still up for debate. RCT are a common clinical issue in the elderly population. The two main categories of treatment are nonsurgical and surgical, with the majority of patients beginning with a trial of conservative therapy. There are other nonsurgical therapies to think about, including physical therapy and injections of corticosteroids, hyaluronate, and platelet-rich plasma. **Materials and Methods:** This prospective study was conducted for a year in Gwalior (M.P.) with the Vidya MRI Center by the radio diagnostic section of the G.R. Medical College and the J.A Group of Hospitals. The study included a range of age groups' worth of patients with shoulder joint problems who were referred to Vidya MRI. Seventy individuals with unilateral shoulder complaints were included in the study. TOTAL 70 patients were included in this study. When analyzing the MRI images, the patient's symptomatology was taken into account. **Result:** The majority of individuals with rotator cuff injuries are older people (>40 years), specifically those between the ages of 41 and 60.The majority of men experience rotator cuff tears, whereas women who are between the ages of 41 and 60 are more likely to experience them. The most often involved tendon in rotator cuff injuries is the supraspinatus tendon. Interstitial (intrasubstance) tears are the least common type of partial thickness tears, although articular side tears are more prevalent (70%) than bursal side tears (30%). **Conclusion:** Patients treated for partial and full-thickness rotator cuff tears have a significantly higher risk of developing a tear on the opposite side. Rotator cuff tears are common in the aging population and can be managed either non-operatively or surgically.

## INTRODUCTION

One of the most frequent musculoskeletal problems is shoulder dysfunction. They can result from a variety of diseases, each of which has a unique surgical or non-surgical treatment. Due to its numerous directional movements, the shoulder is one of the most difficult joints to diagnose. Furthermore, the muscles make it difficult to directly see shoulder motion. One of the main reasons people go to the orthopedic outpatient clinic is for conditions involving the rotator cuff (RC). The right diagnosis is necessary to choose the best course of treatment.[1]
After back and knee pain, shoulder pain is the third most frequent complaint presented to an orthopedic physician. The most frequent cause of shoulder pain is rotator cuff diseases. Rotator cuff diseases can take many different forms, including tears, inflammation, impingement, and instability. Four muscles and tendons make up the rotator cuff, which aids in stabilizing the shoulder joint. These include the infraspinatus (posteriorly), teres minor, subscapularis, and supraspinatus (superiorly). Supraspinatus, infraspinatus, and/or subscapularis tendon tendinopathy that progresses from partial to complete thickness tears causes rotator cuff failure.[2] Two of the main factors causing shoulder pain and impairment are rotator cuff tears (RCT) and shoulder stiffness. RCTs and shoulder stiffness co-occur in 12.3% to 41.7% of individuals. The glenohumeral


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joints restricted active and passive motions, which are brought on by fibrosis and consequent rigidity of the glenohumeral joint capsule and ligaments, induce shoulder stiffness. The term "stiff shoulder" is frequently used to describe adhesive capsulitis, which causes pain, a "frozen" feeling in the shoulder, and a reduction in range of motion (ROM). Depending on the underlying shoulder pathology, such as RCT, subacromial bursitis, biceps tendinopathy, recent shoulder surgery or trauma, adhesive capsulitis can be classified as primary (idiopathic) or secondary.[3]

Arthroscopy is currently the recommended surgical procedure for repairing a torn rotator cuff among other surgical procedures. A full-thickness rotator cuff injury presents technical difficulties for arthroscopy-based repair. Only the short- and mid-term effectiveness of the arthroscopic procedures has been examined at this level of development. According to the short-term follow-up studies, arthroscopic repair of the rotator cuff has been shown to have positive outcomes, because less postoperative discomfort and deltoid muscle injury, allow patients to continue rehabilitation more quickly, and have favorable results. Even though there are well-established benefits, arthroscopic surgery results are less certain than those from open operations.[4]

A rotator cuff tear diagnosis was made mostly using the patient's medical history and physical findings. The arthrogram simply served as confirmation rather than aiding in the diagnosis of these groups of rips. Furthermore, there was no connection between the degree of rupture and the dye leakage from the shoulder joint. There was no additional information from the double-contrast air-dye investigation to support the physical findings. The size of the rip discovered during surgery was closely connected to the preoperative findings and dependent on the pathologic condition. The largest tears often emerged in patients with severe external rotator muscle weakening, loss of excellent active elevation, and increased crepitus.[5]

## MATERIALS AND METHODS

This prospective study was conducted over the course of a year by the radio diagnostic division of the G.R. Medical College and the J.A Group of Hospitals in collaboration with the Vidya MRI Center in Gwalior (M.P.). Patients from a variety of age groups who had shoulder joint issues and were referred to Vidya MRI were included in the study. The experiment included a total of 70 patients with unilateral shoulder problems. Every patient underwent a complete clinical examination and history review. Ancillary investigations were carried out if required. The patients received brief explanations of the procedure. The absence of pacemakers, metal implants, and drug shrapnel, among other objects that could interfere with magnetic resonance imaging, was ensured.

**Inclusion Criteria**

Any situation where an MRI is used to identify the source of shoulder discomfort.

**Exclusion Criteria**

Postoperative circumstances.

Contraindications for MR imaging.

## RESULTS

[Table 1] shows that maximum number of patients with rotator cuff tears fall in age group from 41 years to 60 years i.e. elderly population (>40 years).

[Table 2] shows that overall male population suffer from rotator cuff tears and among female population rotator cuff tears are common in age group of 41 years to 60 years.

[Table 3] shows that supraspinatus tendon is most common tendon to involve in rotator cuff tears.

[Table 4] shows that among partial thickness tears articular side tears are more common (70%) as compare to bursal side tears (30%), while interstitial (intrasubstance) tears are least common.

**Table 1: distribution of rotator cuff tear patient with respect to age**

| Age distribution | Number of patient | Percentage |
|---|---|---|
| 0 – 10 | 0 | 0 |
| 11 - 20 | 0 | 0 |
| 21 - 30 | 8 | 19.5 |
| 31 – 40 | 6 | 14.6 |
| 41 - 50 | 11 | 26.8 |
| 51 - 60 | 11 | 26.8 |
| 61 - 70 | 3 | 7.4 |
| 71 - 80 | 2 | 4.9 |
| Total | 41 | 100 |

**Table 2: distribution of rotator cuff tear patient with respect to sex**

| Age distribution | Male | Female |
|---|---|---|
| 0 – 10 | 0 | 0 |
| 11 - 20 | 0 | 0 |
| 21 - 30 | 5 | 3 |
| 31 – 40 | 5 | 1 |
| 41 - 50 | 6 | 5 |
| 51 - 60 | 6 | 5 |
| 61 - 70 | 2 | 1 |
| 71 - 80 | 2 | 0 |
| Total | 26 | 15 |


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**Table 3: distribution of different tendon involvementin rotator cuff tears**

| Tendon involved | No. Of tears |
|---|---|
| Supraspinatus | 29 |
| Infraspinatus | 0 |
| Teres minor | 0 |
| Subscapularis | 0 |
| Mixed | 12 |
| Total | 41 |

**Table 4: distribution of surface of rotator cuff involved in partial thickness tears**

| Partial tear | No. Of patient | Percentage |
|---|---|---|
| Articular side | 21 | 70 |
| Interstital | 0 | 0 |
| Bursal side | 9 | 30 |
| Total | 30 | 100 |

## DISCUSSION

Harryman et al published an outstanding long-term follow-up analysis of 105 rotator cuff injuries that were surgically repaired in 1991. Ultrasonography was used following surgery to record the condition of the cuff. Harryman et al came to the conclusion that, if the rotator cuff defects healed, restoration of smaller flaws did not result in better outcomes than repair of larger defects. As a result, postoperative strength in abduction and external rotation was not reliant on the extent of the intraoperative tear. They claimed that the main factor affecting the postoperative outcome following rotator cuff repair is not the magnitude of the operative tear but rather the integrity of the rotator cuff at follow-up. Patients with bigger preoperative tear sizes, however, had a significantly higher likelihood of showing recurring cuff abnormalities at follow-up.[6]

Magnetic resonance imaging (MRI) is the "gold standard" for noninvasive diagnosis of rotator cuff injuries. In order to distinguish between full-thickness tears, partial thickness tears, and undamaged tendons, Ianotti et al. reported that MRI had exceptional sensitivity, specificity, and positive and negative predictive accuracy. However, it was not mentioned if MRI was accurate in determining tear size. In individuals with recurrent rips, Motamedi et al observed that MRI was accurate in estimating tear size. For the detection of significant and massive rotator cuff injuries, MRI exhibited a sensitivity of 79%, specificity of 85%, positive predictive accuracy of 90%, and negative predictive accuracy of 69%, according to their sample of 33 shoulders.[7]

In a typical rotator cuff, the intervening cuff has medium intensity on all pulse sequences while the inner tendons of the rotator cuff muscles have low intensity. Fluid, granulation tissue, or hypertrophied synovium fills rotator cuff defects. On somewhat Ti-weighted pictures, all of these would often have a low or medium intensity, making it challenging to identify them from the normal cuff sections. The signal intensity of fluid or aberrant tissue at the site of the tear is increased relative to normal cuff in proton-density-weighted and, to a greater extent, T2-weighted imaging, making the tears more noticeable.[8]

According to research by Kim et al., rotator cuff illness and full supraspinatus tendon rips are significantly correlated with partial subscapularis lesions. Interestingly, examination of the intraoperative data revealed no correlation between the presence or lack of a cuff lesion and the presence or absence of a labral or capsular lesion. The "anterior mechanism," or anterior capsular-labral detachment, appears to be the primary cause of shoulder dislocation in our series, in line with the findings of Araghi et al. These researchers also claim that dislocation brought on by the "posterior mechanism," or a full-thickness rotator cuff tear, appears to be the result of many dislocations.[9]

Due to age. Human tendons deteriorate, which leads to a weaker structure and, secondarily, a higher incidence of tendon tears. These tears may become clinically noticeable following trauma may be connected to an idiopathic onset of symptoms. Even in asymptomatic populations, rotator cuff ruptures are highly prevalent. In four distinct studies, cadavers with up to 20% of rotator cuff tears were discovered even though there was no sign of shoulder discomfort prior to death.[10]

## CONCLUSION

Rotator cuff tears are common among the aging population and can be managed through either non operative or surgical therapy. In our study among rotator cuff tendons tears, most common tendon showing tear on MRI was supraspinatus contributed to 100% of cuff tears. Infraspinatus was the next common tendon to show cuff tears. (29.2%) Only 4.9% of cuff tears are contributed by subscapularis on MRI evaluation. Partial thickness tear of supraspinatus tendon was commoner than full thickness. Articular surface partial thickness tear was the most common type of partial thickness tear in our study. Patients treated for partial and full-thickness rotator cuff tears have a significantly higher risk of having a tear on the contra lateral side and have noticeable deficits in their shoulder function regarding activities of daily living even if the tear is otherwise asymptomatic.


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