

## CASE REPORT

# Rotator Cuff Injury

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## ABSTRACT

**Objective:** To describe the evaluation, management, and rehabilitation of multifactorial rotator cuff lesion in an elderly female.

**Introduction:** The reported onset of pain was gradual. There was no history of fall or trauma. Pain was present on antero-lateral aspect of left shoulder. Pain was sharp and deep on abduction and flexion of the left shoulder and reported a visual analogue scale (VAS) score of 9.5/10.

**Treatment:** The patient was managed conservatively with non-steroidal anti-inflammatory drugs (NSAIDs) and physiotherapy. The patient underwent a 2-month rehabilitation protocol in preparation for return to normal daily activities.

**Uniqueness:** This case involved an elderly female who sustained multiple causative factors for rotator cuff lesions.

**Conclusion:** By presenting this case report, we hope for a better understanding of rotator cuff lesions and how to successfully manage and rehabilitate.

**Keywords:** Calcification, Elderly, Physiotherapy, Rotator cuff lesion, Shoulder impingement.

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**Conflict of interest:** None

## INTRODUCTION

Shoulder pain is a common musculoskeletal complaint in the elderly population. The frequency of shoulder pain in the elderly has been estimated to range from 21 to 27%, and the prevalence of rotator cuff tear increases with advanced age. The etiology of rotator cuff disease includes both extrinsic and intrinsic factors. Rotator cuff dysfunction encompasses a spectrum of pathological changes, ranging from impingement syndrome to rotator cuff tendonitis to rotator cuff tendon tear.

The aim of managing rotator cuff disease is to regain normal shoulder function and to improve functional abilities in elderly patients. When the concept of rotator cuff impingement was introduced to the literature, it was stated that it resulted from mechanical impingement of the rotator cuff tendon beneath the antero-inferior portion of the acromion, especially when the shoulder is placed in the forward-flexed and internally rotated position.<sup>1</sup> The author reported that about 90% of rotator cuff tears are a result of subacromial impingement from supraspinatus outlet narrowing. Calcifying tendinitis of the rotator cuff is a common condition in middle-aged individuals.<sup>2</sup> This condition affects 20 to 25% of the population, mostly aged between 30 and 50 years. Women are more frequently affected than men. During the formative stage, a portion of the tendon undergoes fibro cartilaginous transformation, and calcification occurs in this transformed tissue. Partial rotator cuff tears, especially tears in the older population, have a limited ability to heal because of several factors.<sup>3</sup> One is that the torn tendon is under tension during activity as the cuff contracts and at rest because of the weight of the arm and the role of the cuff to compress the humeral head into the glenoid. The torn ends of the tendons, especially the distal margins, often develop tissue that causes resorption of the tendon fibers, and without closure of the defect, healing does not occur. There is also an association of rotator cuff disease with abnormal acromions.<sup>4</sup> Several studies have found a strong association between aging, cuff tears, and altered acromial contours. This change most likely is caused by rotator cuff disease. As the rotator cuff degenerates, the cuff no longer can fulfill its role of providing superior stability and acting as a spacer. Partial rotator cuff tears, especially tears in the older population, have a limited ability to heal because of several factors.<sup>3</sup> This tension causes a relative avascularity around the edges of the tear and causes the ends to retract, which does not allow approximation for healing. In addition, the torn ends of the tendons, especially the distal margins, often develop neovascular tissue that causes resorption of the tendon fibers, and without closure of the defect, healing does not occur.

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## CASE REPORT

A 53-year-old female came with left shoulder pain since 8 months. She reported that onset was gradual. There

was no history of fall or trauma. Pain was present on anterolateral aspect of left shoulder. Pain was sharp and deep on abduction and flexion of the left shoulder. Patient reported a VAS of 9.5/10. The SPADI (shoulder pain and disability index) score was 110/130. It was aggravated by lying on the shoulder, reaching and lifting with the left arm. Pain was relieved by medications and keeping shoulder adducted. Previous treatment received included medications (Tylenol, or anti-inflammatories, and calcium supplements) along with physiotherapy [hot packs, ultrasound, and range of motion (ROM) exercises including pulleys, wheel, and ladder]<sup>5</sup> for 4 weeks, but patient complained of increased pain. She further consulted the orthopedic surgeon; medications were changed to T. Ultracet and Pantop-D. Physiotherapy included hot packs for 15 to 20 minutes two times daily.<sup>4</sup> Along with this, she also took a week of acupuncture treatment.<sup>6</sup> At this time, the patient presented to the clinic with dull and achy pain in the left shoulder and with a sharp pain to the posterior and anterolateral left arm. She complained of not able to move her left arm and unable to dress and wash herself. The pain was aggravated by any movement of the left arm, lying on the left arm and she was awakened at night when she rolled onto the affected arm. The pain was considerably relieved by taking hot fomentation. Patient had a medical history of hypertension and hypothyroidism and diabetes mellitus but was under control with medications. Hematological tests revealed normal uric acid level. Family history was unremarkable.

On examination, upper extremity deep tendon reflexes were normal bilaterally and light touch sensation examination was unremarkable. Cervical spine bilateral lateral flexion, bilateral rotation, and flexion were full and pain-free. Her active left glenohumeral ROM was: flexion 0 to 80°, abduction 0 to 45°, external rotation 0 to 10°, and internal rotation 0 to 20.<sup>7</sup> The left glenohumeral

joint passive ROM was 5° more in each direction. Posterior and posteroinferior glide was restricted and painful. The resisted left glenohumeral joint flexion, abduction, and internal and external rotations were graded 3/5. Her left deltoid, infraspinatus, supraspinatus, and teres muscles were spasmodic and tender upon palpation. There was severe point tenderness over the left deltoid tuberosity and the rotator cuff. Special tests, such as painful arc (pain and weakness between 60 and 120° shoulder abduction), Empty can test, and Hawkins Kennedy impingement test<sup>7</sup> were positive and drop arm test was negative.

Figure 1 shows MRI finding reduced glenohumeral joint space, calcific (calcium deposition) density near inferior angle of glenoid. Figure 2 shows MRI finding acromioclavicular osteoarthritic changes with laterally downsloping acromion with acromial osteophyte.

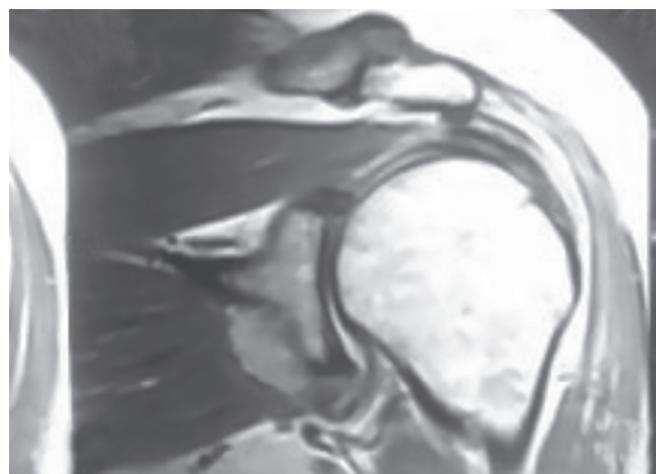
## INTERVENTION

### Initial Treatment

This included hot packs, anteroposterior and long axis distraction mobilization, sustained capsular stretches, anteroposterior glenohumeral glides, grade III Kaltenborn mobilization technique for increasing the ROM, and grades I and II for pain relief, active as well as active assisted exercises. We also used suspension therapy to reduce the pain and pendular home exercises for the left shoulder were done.<sup>8</sup> The patient came regularly for 6 weeks and a considerable improvement in range was appreciated, but pain was still present. At the end of the 6th week, the active left glenohumeral (initial range in brackets) abduction, flexion, and external rotation were 110 (70), 95 (50), and 15 (10)° respectively, and the passive ROM showed even more improvements where the passive abduction, flexion, and external rotation were 100, 115, and 25° respectively. After 6 weeks, strengthening



**Fig. 1:** Reduced glenohumeral joint space, with calcific (calcium deposition) density near inferior angle of glenoid



**Fig. 2:** Acromioclavicular osteoarthritic changes with laterally downsloping acromion with acromial osteophyte

exercises using 0.5 kg dumbbells in all planes of glenohumeral ROM were introduced along with multiangle isometrics and scapular strengthening exercise; there was considerable pain relief (85%) achieved and physiotherapy was restarted with hot packs, gentle mobilization, active assisted exercises with bar, pulley, finger ladder, and strengthening of shoulder muscles with 1 kg dumbbells. Patient's ROM, strength, and pain were markedly improved after the rehabilitation. There was a marked decrease in pain as well as improvement in glenohumeral ROM at the left shoulder with flexion ROM being 160°, abduction 140°, external rotation 60°, and internal rotation 70°. Patient now reported a VAS of 0/10, SPADI of 23/130, and muscle strength also improved and the muscles were graded at 4/5. The patient could perform all her activities of daily living with ease and minimal pain. In addition, the left glenohumeral joint long axis distraction, anteroposterior and posteroinferior manual high speed low amplitude manipulation, capsular stretches was started. At the end of this course of treatment, the patient's left glenohumeral active abduction was 140° and her flexion and external rotation were nearing end range. The left glenohumeral passive abduction was full, but the resisted strength remained 4/5. The patient was attributed to isotonic strengthening exercises using free weights (1 kg dumbbell). A regimen of weight training exercises (isotonic) for shoulder abduction, forward flexion, extension, and internal and external rotations was prescribed.

## DISCUSSION

Rotator cuff pathology is the most common cause of shoulder pain, the most common presenting features of which are shoulder pain, decreased shoulder ROM. This case is unique, in that it involved an elderly female with left multiple rotator cuff lesions with calcific deposition near inferior glenoid, acromioclavicular osteoarthritic changes, a laterally down sloping acromion with acromial osteophyte, supraspinatus tendinosis, subacromial, and subdeltoid bursitis. Rotator cuff lesions in the younger population are rare and often occur chronically in the older population secondary to impingement syndrome.<sup>9</sup> Over time, bony alterations (acromion thickening and bone spurs) develop within the subacromial space. The initial goals of the rehabilitation program were to decrease pain through modality use, and to restore ROM, first passively and progressing to full active ROM. Many therapeutic approaches that have been used to treat a person with rotator cuff lesion include manual therapy, electrical modalities, active exercises, and various basic and advanced joint mobilization techniques. Hot pack and light mobilization shoulder exercises were prescribed to this patient due to pain.<sup>10</sup> The rotator cuff both centralizes

and approximates the humeral head within the glenoid. In addition to rotator cuff strengthening, the patient was administered a full scapular stabilization program. Post pain relief, the exercise regime included rotator cuff strengthening and in addition, a scapular stabilization program. The scapular stabilizers play a vital role in the rehabilitation of rotator cuff repair. Motion of the scapulothoracic articulation is essential for fluent, coordinated movement of the shoulder. With this humeral head alignment disrupted, the likelihood of the greater tuberosity impinging the subacromial structures (supraspinatus tendon, subacromial bursa, and bicipital tendon) increases.<sup>11</sup> "Rehabilitation of a Stiff and Painful Shoulder: A Biomechanical Approach" demonstrates that there are many different treatment regimens for the management of shoulder dysfunction, none of which indicate overwhelming success. Traditionally, the painful, stiff shoulder, commonly diagnosed as frozen shoulder, is assessed without consideration of the entire shoulder complex.<sup>12</sup>

## PROGNOSIS

Variables that correlated with a satisfactory outcome included improvement in pain relief, the ability to carry a 10 to 15 pound suitcase at one side, and the ability to eat using utensil. Changes ranging from tendinosis to subacromial impingement to partial- and full-thickness tears in most rotator cuff injuries can be adequately diagnosed based on a careful history review and physical examination, and respond well to conservative measures.

## CONCLUSION

By presenting this case report, we hope for a better understanding of rotator cuff lesions and how to successfully manage and rehabilitate. Fortunately, most shoulder disorders respond to nonoperative management or may resolve spontaneously. Consequently, physical therapists probably will continue to have an integral role in treating patients with shoulder pain.

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