Original Research

Role of MRI in detecting shoulder pathologies

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ABSTRACT

Background: A prevalent issue that presents challenging diagnostic and treatment options is shoulder pain. The present study demonstrated the role of MRI in detecting shoulder pathologies.

Materials & Methods:83 cases of shoulder pain of both genders were selected. MRI of the Shoulder was performed using 0.3T Centurion imaging system. The sequences used were—AXIAL T1W, AXIAL T2W, AXIALPD, CORONALOBLIQUE STIR, CORONAL OBLIQUE PD, SAGITTAL OBLIQUE T2.

Results: Out of 83 patients, 53 were males and 30 were females. Pathologies were acute bursitis in 13, partial rotator cuff tearsin7, complete rotator cuff tears in 11, labral tears in 9, subacromial impingement syndrome in 5, biceps tendonitis in 18 and adhesive capsulitis in 20 patients. The difference was significant ($P< 0.05$).

Conclusion: The gold standard for shoulder diagnostic imaging associated with soft tissue injury is magnetic resonance imaging. Its non-invasiveness, lack of contrast exposure, nonionizing radiation, high degree of resolution, and capacity to assess several possible pathologic processes are among its benefits.

Keywords: musculoskeletal, shoulder, MRI

Introduction

A prevalent issue that presents challenging diagnostic and treatment options is shoulder pain. It makes up 5% of all musculoskeletal consultations and is the third most prevalent musculoskeletal complaint in the general population.[1] It is the second most common reason for referring patients to orthopaedics or general. Atraumatic instability, tendinosis, and arthropathy are among the mild inflammatory or biomechanical causes of pain that are more common in patients under 30 years of age.[2] Rotator cuff tears and impingement are the main causes of shoulder pain in adults over 40. Magnetic resonance imaging (MRI), a non-invasive tool for identifying which patients may benefit from surgery, has become more significant as novel arthroscopic procedures for treating rotator cuff diseases have emerged.[3]

The rotator cuff is the most commonly affected structure in the shoulder, and sub acromialimpingement syndrome is the leading cause of rotator cuff injury.Rotator Cuff Tendinitis is characterized by inflammation of the rotator cuff tendons, which isfrequently brought on by abrupt increases in activity or repetitive overhead motions.[4]Shoulder soreness and tenderness are common symptoms of tendinitis, especially whenmoving. Rotator cuff tear may result from acute trauma, prolonged overuse, or degenerativechanges can all result in a tear in one or more of the rotator cuff tendons. Partial or full-thickness rotator cuff injuries can cause shoulder pain, weakness, and restricted range ofmotion.[5] Impingement syndrome is the result of pinched or compressed rotator cuff tendonsbetween the acromion and humerus, the bones that make up the shoulder joint. Impingementcan cause the rotator cuff tendons to become inflamed, painful, and irritated.[6]The present study demonstrated the role of MRI in detecting shoulder pathologies.

Materials & Methods

The study was carried out on 83 cases of shoulder pain of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. MRI of the Shoulder was performed using 0.3T Centurion imaging system. The sequences used were—AXIAL T1W, AXIAL T2W, AXIALPD, CORONALOBLIQUE STIR, CORONAL OBLIQUE PD, SAGITTAL OBLIQUE T2. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table: I Distribution of patients

Total- 83		
Gender	**Male**	**Female**
Number	53	30

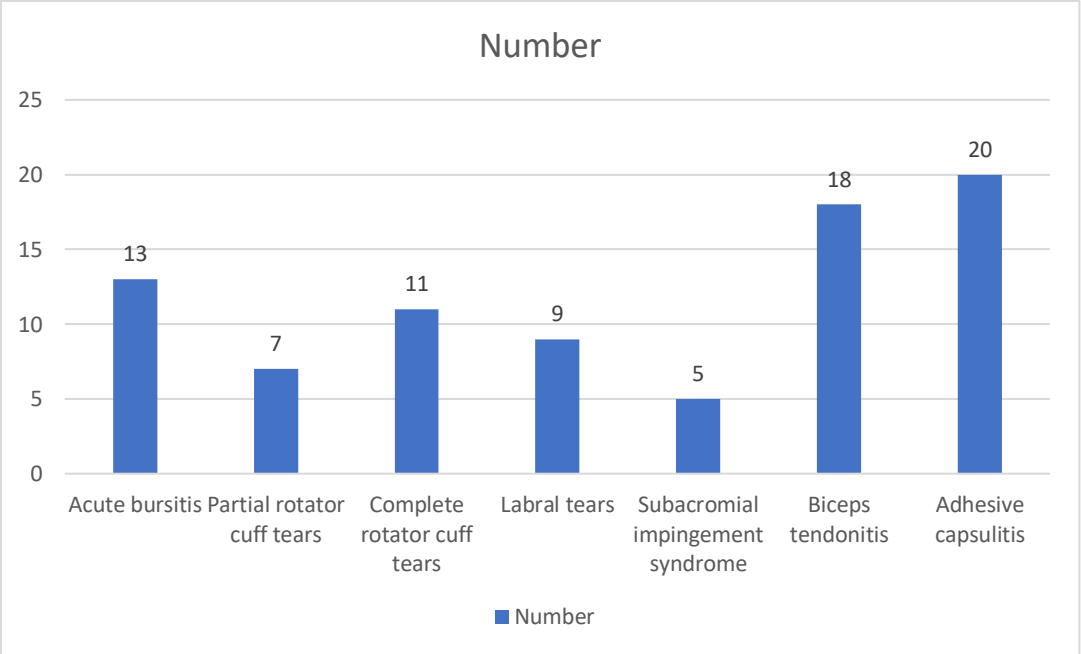
Table I shows that out of 83 patients, 53 were males and 30 were females.

Table: II Assessment of pathologies on MRI

Pathologies	Number	P value
Acute bursitis	13	0.05
Partial rotator cuff tears	7	
Complete rotator cuff tears	11	
Labral tears	9	
Subacromial impingement syndrome	5	
Biceps tendonitis	18	
Adhesive capsulitis	20	

Table II, graph I shows that pathologies were acute bursitis in 13, partial rotator cuff tearsin7, complete rotator cuff tears in 11, labral tears in 9, subacromial impingement syndrome in 5, biceps tendonitis in 18 and adhesive capsulitis in 20 patients. The difference was significant (P< 0.05).

Graph: I Assessment of pathologies on MRI



Discussion

For the diagnosis of RCTs, T2-weighted, fat-suppressed, and FSE images acquired with a high-quality shoulder coil are reliable.[7] Falsenegative full-thickness tears usually happen when the subdeltoid bursal capsule is thicker and the patient does not have an effusion. False-negative partial-thickness tears are somewhat prevalent, particularly for shallow tears.[8,9] Radiologists can reduce the likelihood of missing partial-thickness tears by closely examining the rotator cuff's low-signal surfaces, noting any disruptions to the low-signal surface layers, and using intra-articular and IV gadolinium to make these lesions more noticeable.[10,11,12]The present study demonstrated the role of MRI in detecting shoulder pathologies.

We found that out of 83 patients, 53 were males and 30 were females. Chaudhari et al[13]demonstrated the role of MRI in detecting shoulder pathologies encountered in patients of shoulder pain. The study included 40 patients referred for MRI Shoulder after a detailed clinical workup. Images were acquired using various non-contrast enhanced sequences and were analyzed for pathologies.Out of the 40 patients 8 patients were excluded. Among the 32 patients included in the study the various pathologies were detected on MRI. MRI is the preferred test for evaluating impingement syndrome and rotator cuff pathology

We found that pathologies were acute bursitis in 13, partial rotator cuff tearsin7, complete rotator cuff tears in 11, labral tears in 9, subacromial impingement syndrome in 5, biceps tendonitis in 18 and adhesive

capsulitis in 20 patients. Mohamed SA et al[14]evaluated the role of MRI, MR Arthrography compared to arthroscopy in shoulder pain. There were fifty- six males and forty- four females, their ages ranged between 19 & 69 years (mean age, 31 years). There is significant positive correlation between MRI and arthroscopy with r = +0.9, 95% CI (0.82- 0.99) and p value = 0.003. MRI showed 100 % specificity for anterior labral tears, SS (supraspinatus) partial thickness tear and SS full thickness tear and 98.9 % specificity for SLAP (superior labrum anterior to posterior). MRI showed 76.9% sensitivity for anterior labral tears and SS partial thickness tear. Conventional MRI showed 54.5% sensitivity in diagnosis of SLAP tears and 83.3% sensitivity in diagnosis of supraspinatous full thickness tears.

Iannotti JP et al[15] in their study, the sensitivity, specificity, and predictive value of magnetic resonance imaging in the diagnosis of lesions of the rotator cuff, glenohumeral capsule, and glenoid labrum were evaluated in ninety-one patients and fifteen asymptomatic volunteers. Magnetic resonance imaging demonstrated 100 per cent sensitivity and 95 per cent specificity in the diagnosis of complete tears, and it consistently predicted the size of the tear of the rotator cuff. There was a definite correlation between atrophy of the supraspinatus muscle and the size of a complete, chronic tear of the rotator cuff. The sensitivity and specificity of magnetic resonance imaging in the differentiation of tendinitis from degeneration of the cuff were 82 and 85 per cent, and in the differentiation of a normal tendon from one affected by tendinitis with signs of impingement the sensitivity and specificity were 93 and 87 per cent. The formation of spurs around the acromion and acromiocalvicular joint correlated highly with increased age of the patient and with chronic disease of the rotator cuff. The sensitivity and specificity of magnetic resonance imaging in the diagnosis of labral tears associated with glenohumeral instability were 88 and 93 per cent. The study showed that high-resolution magnetic-resonance imaging is an excellent non-invasive tool in the diagnosis of lesions of the rotator cuff and glenohumeral instability.

The shortcoming of the study is small sample size.

Conclusion

Authors found that tThe gold standard for shoulder diagnostic imaging associated with soft tissue injury is magnetic resonance imaging. Its non-invasiveness, lack of contrast exposure, nonionizing radiation, high degree of resolution, and capacity to assess several possible pathologic processes are among its benefits.

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