

# Correlation of Magnetic Resonance Imaging Shoulder and Ultrasound Shoulder in Diagnosis of Shoulder Joint Pathologies

Pranjali Sahu<sup>1</sup>, Rajesh Mehta<sup>2</sup>

<sup>1</sup>Resident, Department of Radiodiagnosis, R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India  
Corresponding Author's Email: ps28031994ps[at]gmail.com

<sup>2</sup>Professor, Department of Radiodiagnosis, R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India

**Abstract:** *Background:* Shoulder pain is a common musculoskeletal complaint, posing diagnostic challenges due to the complex anatomy and diverse pathologies of the shoulder. This study aims to evaluate the role of USG and MRI in patients with shoulder joint pathologies. *Main objective of the study was to find out effectiveness and accuracy of USG in patients with shoulder joint pathologies by comparing its findings with MRI. Material and Method:* A prospective interventional study was conducted at a tertiary care hospital, involving 98 patients with shoulder joint pathology. The study spanned from January 2023 to January 2025. Patients aged more than 12 years, referred for shoulder MRI, were included, excluding those with claustrophobia, patient with metallic implant and cardiac pacemaker. *Results:* The study group was predominantly male (62.2%), with the highest incidence of shoulder pathologies in the 41-50 age group (31.6%). Rotator cuff was most common pathology among shoulder joint pathology. The Supraspinatus tendon was most commonly affected (77.55% of cases). USG findings included Supraspinatus, Infraspinatus, Tear minor, Sub Scapularis, Biceps Tendon, sub acromian- sub deltoid, Sub Coracoid and ACJ pathology being the most common pathology. *Conclusion:* On the basis of the study, a definitive diagnosis necessitates a combination of clinical evaluation, ultrasound, and MRI. In cases when ultrasound and MRI assessments fail to resolve the clinical issue, additional evaluation using arthrography or arthroscopy should be contemplated.

**Keywords:** Shoulder pain, ultrasound, MRI, rotator cuff, tendon injury

## 1. Introduction

The shoulder pathologies consist of the acromioclavicular and glenohumeral joints. The latter is a type of synovial ball-and-socket joint involving the glenoid fossa of the scapula and the head of the humerus. It facilitates a variety of movements, rendering it the most flexible and least stable joint in the human body.

The acromioclavicular joint is a diarthrodial synovial joint that facilitates shoulder abduction and flexion. The biceps tendon and the rotator cuff muscles serve as two dynamic stabilizers of the shoulder joint. The glenoid labrum, the capsular ligaments, and negative intra-articular pressure constitute three static stabilizers. The structure comprises the supraspinatus, subscapularis, infraspinatus, and teres minor muscles. The rotator cuff complex stabilizes the humeral head within the glenoid cavity. A musculotendinous collar surrounds the joint and offers support, except in the inferior region.<sup>1</sup>

Shoulder pain is one of the most common complaints encountered in orthopaedic practice and often leads to considerable disability. Even though a large amount of clinical tests used for the diagnosis of painful shoulder are considered accurate in determining the location of the periarticular lesions, these entities may be difficult to differentiate by physical examination. Clinical diagnosis have low accuracy in comparison with arthroscopy.<sup>2</sup>

The lesions of the rotator cuff are common cause of shoulder pain and dysfunction. Cuff strain, Impingement syndrome, Rotator cuff tears (RCT) make up a group of lesions that produce shoulder pain. It is clinically difficult to differentiate

between these diagnoses and distinguish cuff problems from other conditions like Glenohumeral instability. Rotator cuff injury is a different spectrum, which is of the nature of chronic injury because of the intrinsic nature of the musculo-tendinous and osseotendinous part of the Rotator cuff and the anatomically narrow subacromial space.<sup>2</sup>

Rotator cuff pathologies, particularly RCT, are a common cause of pain involving the shoulder. Clinical examination alone has a limited value in deciding on the management options for the underlying aetiology. The choice between conservative care and surgical intervention is contingent upon a precise diagnosis and the extent of any underlying rotator cuff injury.<sup>3</sup>

The optimal imaging techniques for assessing suspected RCT are high-resolution ultrasonography (USG) and magnetic resonance imaging (MRI). Each of these modalities possesses distinct advantages and disadvantages. Accuracy, availability, cost-effectiveness, and expertise are critical characteristics that inform the selection of the optimal modality.<sup>3</sup>

Improvement in the resolution of ultrasound machines, redefined technique and better understanding of the pathology have contributed to its high accuracy in the diagnosis of rotator cuff pathology. High resolution ultrasound is non invasive, less expensive and nonionizing modality with good sensitivity in detecting both rotator cuff and non rotator cuff disorder.<sup>4</sup> USG is analogous to MRI for imaging soft tissues and diagnose rotator cuff pathologies, however, different studies yielded varied results.<sup>5</sup> It serves as a complementary role to MRI of the shoulder. The reported accuracy, sensitivity and specificity of USG in the detection of any tear, whether partial or full thickness are all greater

than 90%. High resolution ultrasound can also reveal the presence of other abnormalities that may mimic RCT at clinical examination, including Tenosynovitis, Tendinosis, Calcific tendinosis, Subacromial-Subdeltoid bursitis, Greater tuberosity fracture etc. Plain film radiography still being the basic initial investigation required for assessing bony trauma, osteoarthritis and most other arthropathies. They are often supplemented by other techniques for primarily soft tissue abnormalities, such as rotator cuff disease or masses.<sup>4</sup>

Previous studies have assessed the accuracy of ultrasound and MRI in detecting rotator cuff injuries, with only a limited number comparing the two modalities.

MRI has become the “gold standard” for detecting both subtle and obvious internal derangement and assessing overall joint structure. MRI is reliable technique for the evaluation of rotator cuff tendons; previous low power magnet MRI’s provided only a static evaluation of the shoulder joint and indirectly suggested the diagnosis of subacromial impingement. Whereas, recent super conductive magnets make it possible to do a dynamic evaluation of the shoulder joint to some extent.<sup>4</sup>

Over the last two decades musculoskeletal USG has established itself as a versatile imaging modality in the fields of radio-diagnosis, sports medicine and rheumatology. It has gained its rightful place in literature along with MRI. Cost effectiveness and ready availability are its biggest advantages in several clinical settings. The real time capability of ultrasound in conducting dynamic studies in areas like the shoulder is a very big asset.

MRI is a valuable, non-invasive, radiation free diagnostic imaging modality.<sup>5</sup> Hence, over the years it has gained popularity for evaluating rotator cuff abnormalities. But its high-cost, long waiting-time, lengthy procedure, and lack of dynamic assessment of shoulder call for an alternative imaging modality.

The present study was carried out to evaluate the diagnostic accuracy of US compared to MRI in delineating various rotator cuff and associated non rotator cuff pathologies of shoulder joint.

## 2. Material and Method

This study was a prospective interventional conducted at R.D.Gardi medical college and hospital at Radiodiagnosis Department, Ujjain, M. P. India over a period from January 2023 to January 2025. The primary aim was to evaluate the pathologies of the shoulder joint in patients presenting with shoulder pain using Magnetic Resonance Imaging (MRI) and Ultrasound (USG). We received approval from the Institutional Ethics Committee ensuring all ethical guidelines and standards were strictly followed.

Inclusion criteria of the study of participant were with pain suspected to be arising from the shoulder joint, with restricted movement at shoulder joint, with trauma to shoulder joint and all gender above 12 years.

Exclusion criteria of the study of participant were patients those who had already undergone shoulder surgery or prosthesis of shoulder, Patients with contraindications for MRI (claustrophobia, patient with metallic implant and cardiac pacemaker), Patient not willing to be part of the study and Age of subject below 12 years.

### Sample size

Based on the study of Abhinay Gupta et al., 85% sensitivity and 87% of specificity found for predicting diabetic nephropathy based on NLR and IL6 with 95% confidence level. 98 cases of sample size calculated based on 50% prevalence of disease, 10% acceptable precision and 0.05 of significance level.

Based on inclusion and exclusion criteria, 98 patients were enrolled at our tertiary centre. These patients with clinically suspected musculotendinous pathologies. After deriving a detailed history and then examining patient thoroughly, relevant investigations were carried out such as xray shoulder joint (AP & Axial), Ultrasonography (shoulder joint) and MRI shoulder joint. Patients fulfilling the inclusion criteria were included. MINDRAY DC 80 USG Machine or GE LOGIC V5 USG machine.

### Statistical Analysis

Qualitative data represented as number with percentage whereas quantitative data represented as mean with standard deviation. MRI was considered as a gold standard test, measurement of agreement test was calculated for USG. Sensitivity and specificity of USG calculated based on diagnostic test. All the statistical analysis done with the help of IBM SPSS 26.0 version. <0.05 of any value considered as a statistical significant.

## 3. Observation and Results

The present study is a prospective study conducted in Department of Radio diagnosis, R.D.Gardi Medical College, Ujjain.

**Table 1:** Demographic characteristic

|            |            | Frequency | Percent |
|------------|------------|-----------|---------|
| Age group  | ≤30        | 8         | 8.2     |
|            | 31-40      | 19        | 19.4    |
|            | 41-50      | 31        | 31.6    |
|            | 51-60      | 22        | 22.4    |
|            | >60        | 18        | 18.4    |
| Gender     | Male       | 61        | 62.2    |
|            | Female     | 37        | 37.8    |
| Occupation | Farmer     | 32        | 32.7    |
|            | Teacher    | 7         | 7.1     |
|            | Driver     | 6         | 6.1     |
|            | Doctor     | 3         | 3.1     |
|            | House Wife | 4         | 3.1     |
|            | Student    | 3         | 3.1     |
|            | Conductor  | 2         | 2       |
|            | Retired    | 2         | 2       |
|            | Athlete    | 3         | 1       |
|            | Labour     | 35        | 1       |
|            | Police     | 1         | 1       |

A total of 98 patients were selected based on clinically suspected musculotendinous pathologies between November 2024 to July 2025 and evaluated in this study. Observation

were made based on clinical history of the patient. Overall Mean age of the patient was  $48.73 \pm 11.72$  years. Most common age group was 41-50 years whereas least common age group was  $\leq 30$  years. Male population was having predominant cases with shoulder joint pathologies compared

to females. Majority of the patients having farmer occupation background. (table :1) These patients having complaints of pain or restricted movement from <1 week to 1 year. (Figure 1)

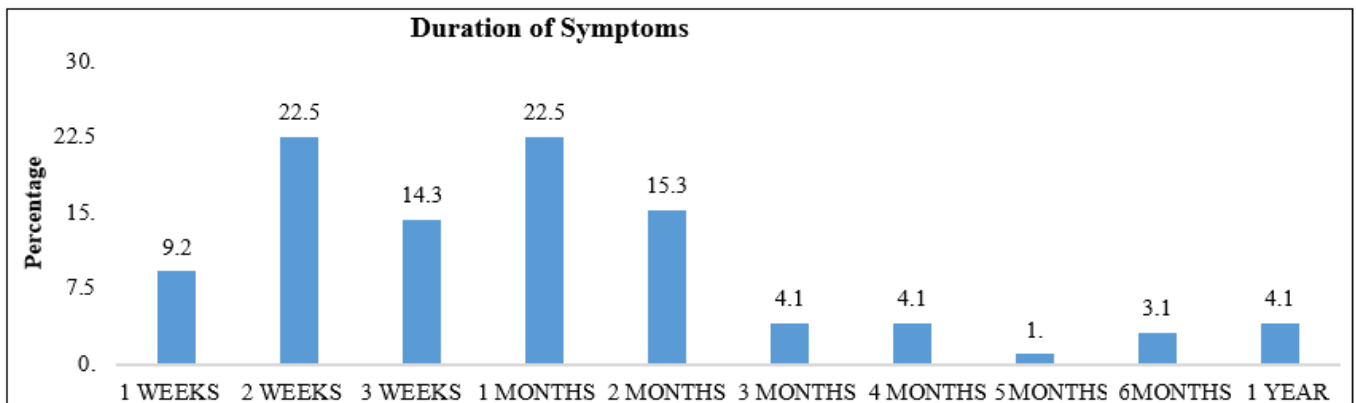


Figure 1: Duration of Symptoms

Table 2: Affected shoulder pathology

|               |       | Frequency | Percent |
|---------------|-------|-----------|---------|
| Affected Side | Left  | 22        | 22.4    |
|               | Right | 76        | 77.6    |
| Dominant Hand | Left  | 12        | 12.2    |
|               | Right | 86        | 87.8    |

Out of 98 patients, 22.4% were affected from left side whereas 77.6% were affected from right side.12.2% were affected in left dominant hand whereas 87.8% were affected in right dominant hand. (table:2)

**USG Findings**

In the existing study, Supraspinatus, Infraspinatus, Tear minor and Sub Scapularis and Biceps Tendon type of pathologies were observed among Musculotendinous. Among Supraspinatus pathologies, 30.6% were Tendinosis, 19.4% were Full Thickness tear, 27.6% were Partial Thickness tear and 22.4% were normal Supraspinatus pathologies. Among Infraspinatus pathologies, 11.2% were Tendinosis, 1% were Full Thickness tear, 8.2% were Partial Thickness tear and 79.6% were normal Supraspinatus pathologies. Among tear minor pathologies, 4.1% were Tendinosis and 95.9% were normal pathologies. Among Sub Scapularis pathologies, 4.1% were Tendinosis, 2% were Full Thickness tear, 5.1% were Partial Thickness tear and 88.8% were normal pathologies. Among Biceps tendon pathologies, 6.1% were Tendinosis and 93.9% were normal pathologies.

In the present study, 33.7% had sub acromian- sub deltoid and 19.4% had sub coracoid observed among fluid in bursae.19.4% were observed as PBT.12.2% were observed as ACJ pathology.11.2% had SA and 3.1% had SC.

**MRI Findings**

In the existing study, Supraspinatus, Infraspinatus, Tear minor and Sub Scapularis and Biceps Tendon type of pathologies were observed among Musculotendinous. Among Supraspinatus pathologies, 36.7% were Tendinosis, 23.5% were Full Thickness tear, 29.6% were Partial Thickness tear and 10.2% were normal Supraspinatus pathologies. Among Infraspinatus pathologies, 16.3% were Tendinosis, 2% were Full Thickness tear, 9.2% were Partial Thickness tear and 72.4% were normal Supraspinatus pathologies. Among tear minor pathologies, 4.1% were Tendinosis and 95.9% were normal pathologies. Among Sub Scapularis pathologies, 8.2% were Tendinosis, 2% were Full Thickness tear, 5.1% were Partial Thickness tear and 84.7% were normal pathologies. Among Biceps tendon pathologies, 8.2% were Tendinosis, 2% were full thickness tear and 89.8% were normal pathologies.

In the present study, 38.8% had sub acromian- sub deltoid and 25.5% had sub coracoid observed among fluid in bursae. 19.4% were observed as PBT. 27.6 % were observed as ACJ pathology. 37.8% were type I , 52% were type II and 10.2% were type III Acromion type observed among MRI findings.

Table 3: Measurement agreement between USG and MRI for shoulder joint pathology

|   | Kappa Value | Asymptotic Standard Error <sup>a</sup> | Approximate T <sup>b</sup> | Approximate Significance | Relation |
|---|-------------|--|----------------------------|--------------------------|----------|
| Supraspinatus                             | 0.751       | 0.052                                  | 12.856                     | <0.0001                  | Strong   |
| Infraspinatus                             | 0.692       | 0.081                                  | 9.457                      | <0.0001                  | Strong   |
| Teres minor                               | 0.739       | 0.177                                  | 7.319                      | <0.0001                  | Strong   |
| Sub scapularis tears                      | 0.747       | 0.099                                  | 10.649                     | <0.0001                  | Strong   |
| Biceps tendon musculotendinous tears      | 0.732       | 0.126                                  | 8.205                      | <0.0001                  | Strong   |
| Sub acromian- sub deltoid fluid in bursae | 0.846       | 0.056                                  | 8.425                      | <0.0001                  | Strong   |
| sub coracoidfluid in bursae               | 0.825       | 0.068                                  | 8.296                      | <0.0001                  | Strong   |
| PBT                                       | 0.869       | 0.064                                  | 8.607                      | <0.0001                  | Strong   |
| ACJ pathology                             | 0.413       | 0.103                                  | 4.617                      | <0.0001                  | Moderate |

In the existing study, measurement agreement for USG based on MRI for Supraspinatus, Infraspinatus, Teres minor, Sub scapularis tears, Biceps tendon, musculotendinous tears, Sub

acromian- sub deltoid, fluid in bursae, sub coracoidfluid in bursae, PBT, ACJ pathology were mentioned in table 3.

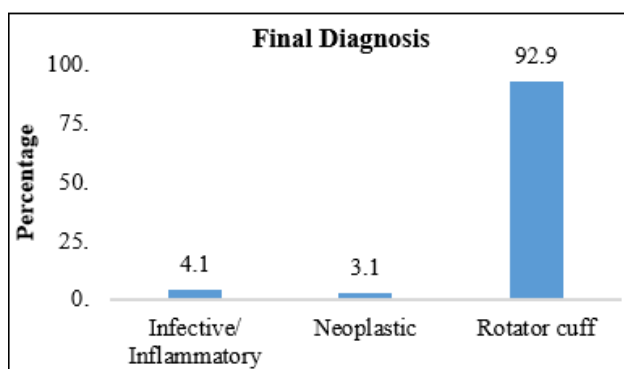
**Table 4:** Sensitivity, specificity, AUC, Accuracy, PPV and NPV of USG based on MRI.

|   | Sensitivity | Specificity | AUC   | Accuracy | PPV    | NPV    |
|---|-------------|-------------|-------|----------|--------|--------|
| Supraspinatus                             | 86.34%      | 100%        | 0.932 | 87.76%   | 100%   | 45.46% |
| Infraspinatus                             | 66.67%      | 97.18%      | 0.819 | 88.78%   | 90%    | 88.46% |
| Teres minor                               | 75%         | 98.94%      | 0.87  | 97.96%   | 75%    | 98.94% |
| Sub scapularis tears                      | 66.67%      | 98.80%      | 0.827 | 93.88%   | 90.91% | 94.25% |
| Biceps tendon musculotendinous tears      | 60%         | 100%        | 0.8   | 95.92%   | 100%   | 95.65% |
| Sub acromian- sub deltoid fluid in bursae | 84.21%      | 98.33%      | 0.913 | 92.86%   | 96.96% | 90.77% |
| sub coracoidfluid in bursae               | 76%         | 100%        | 0.88  | 93.88%   | 100%   | 92.41% |
| PBT                                       | 89.47%      | 97.45%      | 0.935 | 95.92%   | 89.47% | 97.47% |
| ACJ pathology                             | 37.04%      | 97.18%      | 0.671 | 80.61%   | 83.33% | 80.23% |

In the present study, Supraspinatus of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 86.34%, 100%, 100%, 45.46% and 87.76%. Infraspinatus of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 66.67%, 97.18%, 90%, 88.46% and 88.78%. teres minor of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 75%, 98.94%, 75%, 98.94% and 97.96%. Sub Scapularis Tears of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 66.67%, 98.80%, 90.91%, 94.25% and 93.88%. Biceps tendon of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 60%, 100%, 100%, 95.65% and 95.93%. **sub acromian- sub deltoid fluid in bursae** of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 84.21%, 98.33%, 96.97%, 90.77% and 92.86%. Sub Coracoid Fluid In Bursae of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 76%, 100%, 100%, 92.41% and 93.88%. PBT of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 89.47%, 97.47%, 89.47%, 97.47 and 95.92%. ACJ pathology of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 37.04%, 97.18%, 83.33%, 80.23% and 80.61%.

#### Miscellaneous Findings

In the existing study, 2% had bony destruction, 2% had gross echogenic fluid, 1% had humeral head destruction and 1% had mass lesion in humeral head observed following miscellaneous USG findings. In the existing study, 2% had Inflammatory/tubercular arthritis, 2% had Osteomyelitis of humeral head, 1% had Aneurysmal bone cyst, 1% had Large lytic lesion of humerus and 1% had Simple bone cyst observed following miscellaneous MRI findings.



**Figure 2:** Final Diagnoses

In the existing study, 4.1% had infective/ inflammatory pathology, 3.1% had neoplastic, 92.9% had rotator cuff pathology observed among musculotendinous pathology.

#### 4. Discussion

The shoulder joint is the most intricate joint in the body, prone to injury due to its intrinsic structural instability and extensive range of motion. Pathological conditions and injuries affecting the rotator cuff tendons, the cartilaginous and osseous labrum, and other supportive ligamentous tissues of the shoulder result in significant discomfort and disability.<sup>6</sup>

Individuals experiencing shoulder discomfort employ several methods to evaluate their conditions, including clinical examination, X-rays, arthrography, USG, computed tomography, and MRI. MRI is one of the most precise procedures available. Owing to their limited availability, MRI machines cannot serve as the primary diagnostic tool to ascertain the presence of an issue. Conversely, USG is an economical, non-invasive method capable of detecting several clinical conditions.<sup>6</sup>

This is a prospective study of 98 patients who presented with shoulder pain or restricted movements. Out of 98 patients, 4.1% had infective/ inflammatory pathology, 3.1% had neoplastic, 92.9% had rotator cuff pathology observed as musculotendinous pathology. The patients subjected to USG examination of the shoulder joint and then MRI examination of the affected shoulder joint was performed. Findings of USG were compared with MRI findings.

#### Age

In the existing study, overall mean age was  $48.73 \pm 11.72$  years. Most common age group was 41-50 years whereas least common age group was  $\leq 30$  years. Mehta GS. et al. also found that overall mean age was  $49.77 \pm 10.27$  years. Mehta GS. et al.<sup>7</sup>, Biswas et al.<sup>8</sup>, Reddy OM et al.<sup>9</sup>, study were support to the existing study findings whereas Joshi K. et al.<sup>10</sup> study was contradict to our study findings.

#### Gender

In the existing study, 62.2% were males whereas 37.8% were females. Reddy OM et al.<sup>9</sup> study and Joshi K. et al.<sup>10</sup> study was support to the existing study findings.



**Affected Side**

In the existing study, 22.4% were affected from left side whereas 77.6% were affected from right side. Joshi K. et al.<sup>10</sup>, Mehta GS. et al.<sup>7</sup> and AHMED MG et al.<sup>11</sup> also found that right side was having most affecting side. Majority of the people were dominant work with right hand compared to left hand. Therefore, right side shoulder pathologies were more affected compared left sided shoulder pathology.

**Duration of Symptom**

In the present study, majority of the patient presenting musculotendinous pathology complaints in less than 1 month. Reddy OM et al.<sup>9</sup> study also shown similar findings with the present study findings.

**Supraspinatus**

In the existing study, Supraspinatus pathology had significant strong agreement relationship between USG and MRI findings. Amongst the patients with tendonitis, USG could detect the condition in 75.0% patients. Amongst the patients with partial thickness tear, USG could detect the condition in 82.76 % Patients. Amongst the patients with full thickness tear, USG could detect the condition in 82.60% patients.

Based on MRI considered as a gold standard, Supraspinatus pathology of USG sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 86.34%, 100%, 100%, 45.46% and 87.76%.

Vinay C. et al.<sup>4</sup> and Reddy OM<sup>9</sup> study was having similar findings with the existing study findings.

**Infraspinatus**

In the existing study, Infraspinatus pathology had significant strong agreement relationship between USG and MRI findings. Amongst the patients with tendonitis, USG could detect the condition in 56.25% patients. Amongst the patients with partial thickness tear, USG could detect the condition in 77.78 % patients. Amongst the patients with full thickness tear, USG could detect the condition in 50% patients.

Based on MRI considered as a gold standard, Infraspinatus pathology of USG of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 66.67%, 97.18%, 90%, 88.46% and 88.78%.

Vinay C. et al.<sup>4</sup> study was contradict to our study whereas Naganna HP. Et al.<sup>12</sup> study was having supportive findings with the present study findings.

**Tear minor**

In the existing study, Tear minor pathology had significant strong agreement relationship between USG and MRI findings. Amongst the patients with tendonitis, USG could detect the condition in 75.0% patients.

Based on MRI considered as a gold standard, **Tear minor** pathology of USG of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 75%, 98.94%, 75%, 98.94% and 97.96%.

In the existing study, Vinay C. et al.<sup>4</sup> and Naganna HP et al.<sup>12</sup> study was contradict to the existing study findings based on tear minor.

**Sub Scapularis**

In the existing study, Sub Scapularis pathology had significant strong agreement relationship between USG and MRI findings. Amongst the patients with tendonitis, USG could detect the condition in 37.% patients. Amongst the patients with partial thickness tear, USG could detect the condition in 100.0% patients. Amongst the patients with full thickness tear, USG could detect the condition in 100.0% patients.

Based on MRI considered as a gold standard, Sub Scapularis pathology of USG of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 66.67%, 98.80%, 90.91%, 94.25% and 93.88%.

Naganna HP et al.<sup>12</sup>, Vinay C. et al.<sup>4</sup> and Reddy OM<sup>9</sup> study was having similar findings with the existing study findings.

**Biceps Tendon**

In the existing study, **Biceps Tendon** pathology had significant strong agreement relationship between USG and MRI findings. Amongst the patients with tendonitis, USG could detect the condition in 75% patients.

Based on MRI considered as a gold standard, **Biceps Tendon** pathology of USG of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 60%, 100%, 100%, 95.65% and 95.93%.

In the existing study, Vinay C. et al.<sup>4</sup> study was contradict to the existing study findings based on Biceps tendon.

**SUB Acromian- Sub Deltoid Fluid in Bursae**

In the existing study, sub acromian- sub deltoid fluid in bursae pathology had significant strong agreement relationship between USG and MRI findings. It was possible to detect presence of fluid in Sub acromion-sub deltoid in 84.21% patients.

Based on MRI considered as a gold standard, sub acromian-sub deltoid fluid in bursae pathology of USG of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 84.21%, 98.33%, 96.97%, 90.77% and 92.86%.

Vinay C. et al.<sup>4</sup> study and Reddy OM et al.<sup>9</sup> was contradict to our study whereas Lohith. Et al.<sup>6</sup> study was having supportive findings with the present study findings.

**Sub Coracoid Fluid In Bursae**

In the existing study, Sub Coracoid Fluid in Bursae pathology had significant strong agreement relationship between USG and MRI findings. It was possible to detect presence of fluid in sub coracoid fluid in bursae in 76% patients.

Based on MRI considered as a gold standard, Sub Coracoid Fluid In Bursae of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 76%, 100%, 100%, 92.41% and 93.88%.

Vinay C. et al.<sup>4</sup> study and Reddy OM et al.<sup>9</sup> was contradict to our study whereas Lohith. Et al.<sup>6</sup> study was having supportive findings with the present study findings.

### PBT

In the existing study, PBT pathology had significant strong agreement relationship between USG and MRI findings. **It was possible to detect presence of fluid in PBT in 89.47% patients.**

Based on MRI considered as a gold standard, PBT of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 89.47%, 97.47%, 89.47%, 97.47 and 95.92%.

Vinay C. et al.<sup>4</sup> study and Reddy OM et al.<sup>9</sup> was contradict to the existing study findings.

### ACJ Pathology

In the existing study, **ACJ Pathology** had significant moderate agreement relationship between USG and MRI findings. It was possible to detect presence of fluid in ACJ pathology in 37.04% patients.

Based on MRI considered as a gold standard, ACJ of sensitivity, specificity, PPV, NPV and accuracy were respectively as followings: 37.04%, 97.18%, 83.33%, 80.23% and 80.61%.

## 5. Conclusion

Shoulder joint pathologies are prevalent clinical issues; however, their clinical manifestations can be replicated by other shoulder pathologies, which may occur independently or in conjunction with tendon disorders. Clinical evaluation fails to offer sufficient understanding of the patient's issue, rendering it an ineffective guide for management regimens. Imaging assessment is essential for the diagnosis and management of patients. An ultrasound examination yields extensive information regarding individuals suspected of shoulder pain issues and demonstrates significant correlations with MRI. Due to its dynamic characteristics, cost-effectiveness, and accessibility, USG can function as the principal imaging modality for these patients. In cases with clinically suspected shoulder pain disorders, an MRI examination provides a comprehensive assessment of the shoulder joint's components. However, because of its constraints, such as limited availability, elevated costs, and poor patient compliance (including claustrophobic individuals), USG addresses all these issues and limits. MRI frequently provides further or novel insights to the ultrasound findings, elucidating the patient's clinical presentation and enhancing therapeutic strategies. When accessible and practical, MRI should be used into the assessment of these individuals. In instances of clinical-sonographic discordance, it may also function as a problem-solving instrument. Consequently, a definitive diagnosis necessitates a combination of clinical evaluation, ultrasound, and MRI. In cases when ultrasound and MRI assessments fail to resolve the clinical issue, additional evaluation using arthrography or arthroscopy should be contemplated.

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