



EVALUATION OF SHOULDER JOINT BY MRI THROUGH 61 PATIENTS

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ABSTRACT

We all know how important the shoulder joint is and that any defect in this important part impedes us from exercising our normal life, especially the pain associated with most of shoulder disorders. The aim of this study was to highlight the role of MRI in the evaluation of shoulder joint pain. The total number of patients was sixty one (61), the number of females and males was 29 and 33 respectively. Data were taken from PACS in King Abdulaziz University hospital at Diagnostic radiology department in the period between (June-December 2015). All patients suffered shoulder joint pain and underwent MRI. This included 29 females and 32 males age ranged (2–77) years and mean age of 2.29 years. supraspinatus tear was the most common pathologic findings(36.1%). followed by supraspinatus tendonitis (23.0%), bursitis (18.0 %), Hill-Sachs lesion 6.6 % and labral tear (4.9%). Adhesive capsulitis, calcific tendonitis, hook deformity acromion, intact rotator cuff, captohumeral osteomyelitis and recurrent dislocation were the least common pathological findings 1.6%. shoulder pain was more frequent among patients in the age group of above 50 years 50% followed by the age group of (30-50) years 29% , while the age group of <30 years was the least (21.0 %). Magnetic resonance imaging (MRI) is the most suitable method for the diagnosis of shoulder pain. It is highly capable of imaging the soft tissues, muscles and ligaments that characterize the shoulder joint and other joints, this is in agreement with several previous studies in this field

KEYWORDS : Magnetic Resonance imaging, Shoulder Pain, Supraspinatus Tear, Supraspinatus Tendonitis

INTRODUCTION

Shoulder joint is a type of ball and socket joint that lies between the scapula and the humerus [1]. It is the most flexible joint in the body[2]. This flexibility provides the upper limbs with marvelous range of motion such as abduction, adduction, flexion, extension, internal and external rotation as well as circular motion. This wide range of movement makes the shoulder joint unstable [2]. This instability is compensated for by rotator cuff muscles, ligaments, tendons, and the glenoid labrum[3, 4, 5, 6, 7]. Shoulder pain is account for 5% of all musculoskeletal consultations [8]. Plain radiography is a useful tool in evaluation of shoulder joint pain [9]. Magnetic resonance imaging (MRI) is the best imaging modality when the plain radiography result is not satisfied. It has replaced all other medical imaging because of excellent soft tissue contrast and provides multiplanar imaging that not exist in other imaging modalities as well as it is a noninvasive tool. [10, 11] MRI determines the patient's need for surgery through accurate diagnosis.[12, 13,14,15]

The aim of this study was to highlight the role of MR imaging in evaluating shoulder joint in patient suffering of shoulder pain.

MATERIAL AND METHODS

This retrospective study was conducted in the diagnostic radiology department at King Abdul-Aziz University Hospital (KAU), from June to December 2015. PACS was searched and data was collected from 61 patient who complained of shoulder joint pain. All patient underwent MRI examination, These included 29 females and 33 males age ranged (2–77) years and mean age of 2.29 years

MRI was performed using a 3.0-T system (Magnetom symphony 3 Tesla, Siemens-Germany). A body coil was used for transmission, and knee coil was used for MRI.

IMAGING TECHNIQUES**Knee joint MRI protocol at (KAU)**

The first sequence proton density, axial - fast spin-echo (TR/TE: 2000 / 23 flip angle,150°; field of view, 180 mm; matrix, 256 ; slice thickness, 3.0 mm) ; and axial - fast spin-echo T1-weighted (TR/TE: 614 /9.5 ; flip angle,90° ; field of view, 180 mm; matrix, 320; slice thickness, 3.0 mm; and proton density. sagittal ,T2-weighted (TR/TE: 2500 /26 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and proton density. sagittal , fast spin-echo – fat suppression (TR/TE: 2400 /23 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and fast spin-echo. sagittal - T1 (TR/TE: 2400 /23 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and proton density. fast spin-echo , coronal - T2- weighted (TR/TE: 3160 /32 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and sagittal -

Tirm - T1 (TR/TE: 3710 /40 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and proton density. fast spin-echo - fat suppression - coronal (TR/TE: 3050 /41 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 3.0 mm) ; and this sequence Special for meniscus tear , proton density. fast spin-echo sagittal - T2 (TR/TE: 2380 /26 ; flip angle,150° ; field of view, 170 mm; matrix, 320; slice thickness, 1.5 mm)

Statistics

Magnetic imaging findings of shoulder joint were collected with demographic data including age and sex of the study group as well as the affected side. The data were analyzed using SPSS version 19 and the results presented as frequencies, percentages in tables and figures accordingly.

RESULT

All 61 subjects who participated in the study suffered shoulder pain and underwent MRI Examination.

Table 1 shows the prevalence of shoulder pain was more among males (32 patient) compared to females (29 patient). As illustrated in (Table 2), (26 patients) suffered right shoulder pain while (32) had left side and (3 patient) reported pain in both shoulders. Supraspinatus tear was the most common pathologic findings, they were in (36.1%) cases followed by supraspinatus tendonitis 23.0%, bursitis (18.0 %), Hill-Sachs lesion (6.6 %) and labral tear 4.9%. The remaining disorders represented (1.6%) (Table3). In this study, there was a significant correlation between ages of patients and prevalence of shoulder joint pain, the prevalence was more frequent among patients in the age group of above 50 years 50% (Table 4).

TABLE -1 MRI Findings in 61 Patients

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male | 32 | 52.5 | 52.5 | 52.5 |
| | Female | 29 | 47.5 | 47.5 | 100.0 |
| | Total | 61 | 100.0 | 100.0 | |

TABLE-2 Affected Side among 61 patient

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | R | 26 | 42.6 | 42.6 | 42.6 |
| | L | 32 | 52.5 | 52.5 | 95.1 |
| | R&L | 3 | 4.9 | 4.9 | 100.0 |
| | Total | 61 | 100.0 | 100.0 | |

TABLE- 3 MRI Findings for 61 Patients

| Disorders | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------------------|-----------|---------|---------------|--------------------|
| Bursitis | 11 | 18.0 | 18.0 | 18.0 |
| Hill-Sachs lesion | 4 | 6.6 | 6.6 | 24.6 |
| supraspinatus tear | 22 | 36.1 | 36.1 | 60.7 |
| Osteoarthritis | 1 | 1.6 | 1.6 | 62.3 |
| labral tear | 3 | 4.9 | 4.9 | 67.2 |
| supraspinatus tendonitis | 14 | 23.0 | 23.0 | 90.2 |
| adhesive capsulitis | 1 | 1.6 | 1.6 | 91.8 |
| calcific tendonitis | 1 | 1.6 | 1.6 | 93.4 |
| hook deformity acromion | 1 | 1.6 | 1.6 | 95.1 |
| intact rotator cuff | 1 | 1.6 | 1.6 | 96.7 |
| capitohumeral osteomyelitis | 1 | 1.6 | 1.6 | 98.4 |
| recurrent dislocation | 1 | 1.6 | 1.6 | 100.0 |
| Total | 61 | 100.0 | 100.0 | |

TABLE- 4 Frequency of shoulder among patients ages

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | <30 | 13 | 21.0 | 21.0 | 21.0 |
| | 30-50 | 18 | 29.0 | 29.0 | 50.0 |
| | >50 | 31 | 50.0 | 50.0 | 100.0 |
| | Total | 62 | 100.0 | 100.0 | |

DISCUSSION

The shoulder is the most complex and flexible joint in the body prone to different problems which lead to pain that affects patient's live and his daily activity. It was therefore necessary to have an effective means to evaluating shoulder joint pain which was the main symptoms among our study group (Total number = 61).

From our results as shown below in the tables we found that MRI is a great and effective way for evaluating shoulder joint pain. In this study all cases (61) were correctly diagnosed by MRI with different shoulder disorders.

Regarding patients gender the prevalence of shoulder pain was more among male patients 52.5% (32 patient) compared to female 47.5% (29 patient) (Table1). This result was in accordance with (Chaudhari P. 2017) who observed in his study the increased number of males(70%) over females (30%) [8]. Also our result was in contrast to (Bot S D M. et al 2005) who reported that shoulder pain has been found to be more prevalent among females [16].

Left shoulder was the common affected side 52.5% (32 patient) followed by 42.6% (26 patient) suffered right shoulder pain and bilateral represented 4.9% (3 patient) (Table 2).

Regarding MRI pathologic findings, supraspinatus tear was the most common pathologic findings, they were in 36.1% cases (22 patient) followed by supraspinatus tendonitis 23.0% (14 patient), bursitis 18.0 % (11 patient), Hill-Sachs lesion 6.6 % (4 patients) and labral tear 4.9% (3 patients). Adhesive capsulitis, calcific tendonitis, hook deformity acromion, intact rotator cuff, capitohumeral osteomyelitis and recurrent dislocation were the least common pathological findings 1.6% (one patient each). (Table3).

In this study we noticed the correlation between age group and the prevalence of shoulder pain among our participant. Shoulder pain was more frequent among patients in the age group of above 50 years 50% (31 patient). This result was in contrast to (Bhawna et al 2016) who said: the prevalence of shoulder pain is higher in middle age between 41-50 years [17]. In our study the age group of (30-50) years represented 29% (18 patient), while the age group of <30 years was the least 21.0 % (13 patient) (Table 4).

Among our study group we had a two-year-old child who also suffered shoulder joint pain and the MRI finding for this case was capitohumeral osteomyelitis. This confirms that the shoulder joint pain is not limited to adults.

CONCLUSION

Magnetic resonance imaging (MRI) is an excellent modality for evaluating shoulder pain. It is highly capable of imaging the soft

tissues, muscles and ligaments that characterize the joints, this is in agreement with several previous studies in this field

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