

ROLE OF MAGNETIC RESONANCE IMAGING IN EVALUATION OF ANTERIOR KNEE PAIN

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Introduction

Anterior Knee Pain (AKP) is one of the most common knee complaints. Clinical examination is not usually conclusive to point out the exact location of the lesion causing pain.⁽¹⁾ In the recent decades, Magnetic Resonance Imaging (MRI) has become the gold standard imaging modality for several knee pathologies as it is safe, lacking use of ionizing radiation. Multiplanar imaging capability and superior soft tissue detail provides a distinct advantage for MRI over other imaging modalities in addition to its non-invasive, non-operator dependent, and cost effective nature. MRI is well known for being particularly useful for scanning and detecting abnormalities in soft tissue structures like the cartilage tissues, tendons, and ligaments. Moreover, MR images can be used to assess anatomic variants that may contribute to chronic patellar instability.

Aim of the work

The aim of this study was to assess the role of magnetic resonance imaging in determining the possible causes of anterior knee pain in symptomatic individuals and emphasis on their MRI findings.

Patients and Methods

This prospective study included 60 patients attending the orthopedic Unit at Alexandria University Hospitals with history of anterior knee pain. **Inclusion criteria:** any patient complaining of anterior knee pain. **Exclusion criteria:** Absolute contraindications to MRI Acute post-traumatic knee pain with a clinically suspected fracture. **Each patient was subjected to: Thorough History taking** Including personal, present and past history, **Plain X-Ray** of affected knee joint, **MRI Examination:** All patients underwent MRI of affected knee joint using conventional sequences including T1-TSE, T2-TSE and PDW sequences with or without fat suppression in axial, coronal and sagittal. **Ethical considerations:** Approval for this study was obtained from the Research Ethics Committee of Alexandria Faculty of Medicine. All study procedures were carried out in accordance with the Declaration of Helsinki regarding research involving human subjects. Informed consent was taken from all patients included in this study.

Results

13 disease entities were identified among the 62 examined knees **Table (1)** Hoffa's fat pad impingement was the most common pathology seen followed by chondromalacia patella, 22.5% (14 knees) and 21% (13 knees) respectively. Patellar tendinitis was present in 17.7% (11 knees), 8% (5 knees) of patellar tendinitis were seen as isolated proximal patellar tendinitis (jumper's knee). Osgood-Schlatter disease was observed in 14.5% (9 knees) while Symptomatic bipartite patella was seen in 9.6% (6 knees). Quadriceps fat pad impingement and focal nodular synovitis affecting anterior knee compartments were seen equally each in 6.4% (4 knees) while pre-femoral fat pad impingement was seen in 3.2% (2 knees). Patellar tendon tear was seen in 4.8% (3 knees) and Sinding-Larsen-Johannsson was seen in 3.2% (2 knees). Quadriceps tendon rupture and quadriceps tendinitis were presented equally each of them in 1.6% (1 knee).

Table (1): The distribution of all pathologies among studied knees:

Pathology	No. of knees	percentage
Hoffa's disease	14	22.5%
Chondromalacia patellae	13	21%
Patellar tendinitis	11	17.7%
Osgood schlatter disease	9	14.5%
Symptomatic bipartite	6	9.7%
Quadriceps fat pad impingement	4	6.4%
Focal nodular synovitis	4	6.4%
Patellar tendon tear	3	4.8%
Pre-femoral fat pad impingement	2	3.2%
Sinding larsen Johanessen	2	3.2%
Quadriceps tendinitis	1	1.6%
Quadriceps tendon rupture	1	1.6%

8 patients presented with multiple pathologies. One of them presented by bilateral anterior knee pain Where 12.9% (8 knees) showed double pathologies and 1.6% (1 knee) showed triple pathologies. A combination of Osgood Schlatter disease with Hoffa's fat pad impingement and patellar tendinitis was seen in 11.1% (1 knee) while combination of Osgood Schlatter disease with Hoffa's fat pad impingement alone was present in 11.1% (1 knee). Chondromalacia patellae and Hoffa's fat pad impingement were found combined in 22.2% (2 knees). A combination of symptomatic bipartite patellae with Hoffa's fat pad impingement was seen in 11.1% (1 knee). While combination of symptomatic bipartite patellae with quadriceps fat pad impingement and combination of patellar tendinitis with patellar tenon tear were seen in 22.2% (2 knees) each..

Note that: Hoffa's fat disease was the most common associated pathology with other pathologies seen in 55.6% (5 knees).

Patient 1: A 13-year-old girl came to the orthopedic department complaining of severe right anterior knee pain that starts few weeks ago and exacerbated with physical activity. She reported playing volleyball and gymnastic 5 times a week.

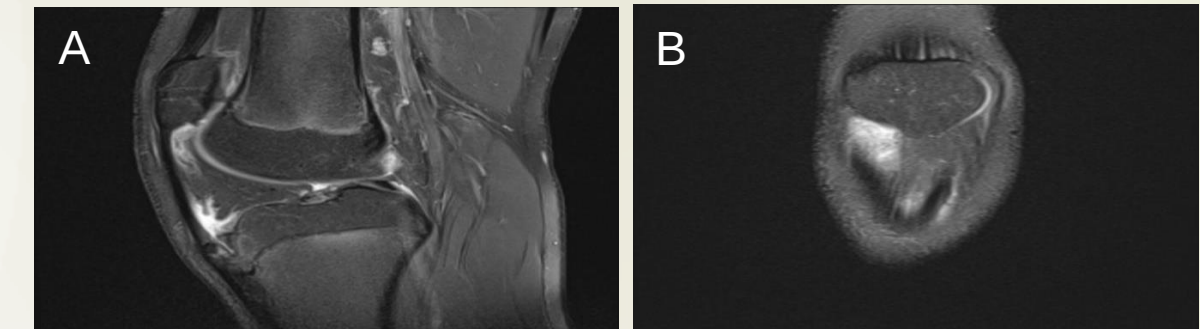
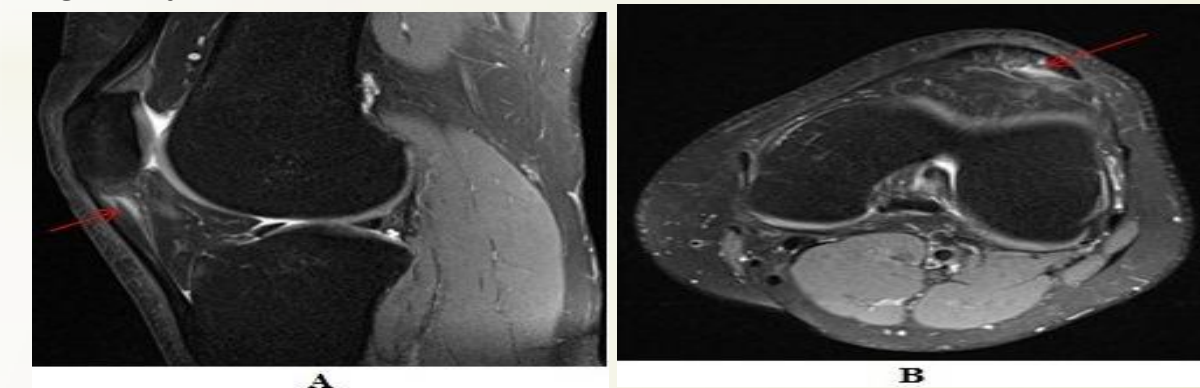


Figure (1) (A) sagittal PD-FS image of right knee, showing fragmented tibial tuberosity with related insertional patellar tendinitis and deep infrapatellar bursitis in keeping with Osgood-Schlatter disease. This is associated with soft tissue edema at the supero-lateral part of Hoffa's fat pad, matching with Hoffa's fat pad impingement. **(B)** coronal PD-FS image showing edema of superolateral part of Hoffa's fat pad.

Patient 2: A 31-year-old male presented with left-sided anterior knee pain and weakness since 7 months that is exacerbated by increased activity and sensation of give way.



Figure(2): (A) Sagittal PDW-FS and **(B)** Axial PDW-FS images showing focal thickening and edema of the proximal patellar tendon with focal minor partial disruption of its inner fibres, reflecting proximal tendinitis with superadded tiny partial tear (ie: jumper's knee)

Conclusion

MRI is the gold standard for detecting different pathologies causing anterior knee pain due to its superior ability to detect soft tissue structures. MRI has a high specificity for detecting the grades of some of these pathological conditions such as chondromalacia patella.