

To describe the MRI features in various types of ligament injury causing painful knee joint

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Abstract

Background: MRI has revolutionized diagnostic imaging of the knee. It provides excellent soft tissue contrast and is capable of evaluating the soft tissue and bony structures in multiple imaging planes which provide significant advantages over other imaging techniques.

Methods: We performed prospective observational study of 100 patients who came with knee pain to MRI centre, Department of Radio Diagnosis, Jehangir Hospital, Pune for MR knee during the period of two years from 28 August 2015 to 27 August 2017.

Results: Out of 100 patients, 52 were diagnosed to have cruciate ligament injury. Out of 52 having cruciate ligament injury, 47 were diagnosed to have ACL injury and 5 were diagnosed to have PCL injury. Out of 47 patients having ACL injury 10 had MD, 12 had IE, 10 had PT and 15 had FTT. Out of 5 patients having PCL injury 1 had MD, 2 had IE, 1 had PT and 1 had FTT.

Conclusion: In our study, ACL injury was more common.

Keywords: ACL, PCL, Knee injury.

Introduction

The knee joint is a biggest joint of the human body with complex articulation characterized by the presence of ligamentous and meniscal structures that play an important role in the stability and mobility.¹

This articulation is subject of very high mechanical stresses. The frequency, diversity and severity of ligament and meniscus injuries occur especially in the young and sportsmen, associated with significant morbidity, frequently need surgical treatment and extensive rest. Joint injury has been recognized as a potent risk factor for the onset of osteoarthritis.²

Although clinical examination is important for the diagnosis of ligament and meniscal injury, painful stress examinations are not always accurate in the acute phase of the injury. In cases of knee joint trauma, clinical examination along with radiographs and even CT scan is not enough to diagnose many internal derangements of this joint. MRI, due to its excellent soft tissue contrast resolution and multiplanar imaging capabilities provides significant advantages over other imaging techniques in the evaluation of traumatic injuries of knee joint.³

MRI has revolutionized diagnostic imaging of the knee. It provides excellent soft tissue contrast and is capable of evaluating the soft tissue and bony structures in multiple imaging planes which provide significant advantages over other imaging techniques. It represents a non-invasive and radiation-free technique that provides access to a real "lesional mapping". It plays a crucial role in the diagnosis and monitoring of traumatic knee injuries. MRI has also been demonstrated as a cost effective technique by reducing unnecessary surgical and arthroscopic interventions.⁴

Material And Methods

Study Site: Department of Radio-diagnosis, Jehangir Hospital, Pune

Study Population: Magnetic resonance imaging of knee joint performed on patients referred to Dept. of Radio-diagnosis, Jehangir Hospital from OPD & indoor departments.

Study Design: Prospective observational study

Time Frame to address the study: 28 August 2015 to 27 August 2017

Inclusion criteria: All cases of knee pain where MRI was used as a modality in diagnosing the cause.

Exclusion criteria

- Contraindications to MRI study, such as patients with cardiac pacemaker, metallic implant, aneurysmal clips
- Claustrophobia or anxiety disorder exacerbated by MRI
- Inability to provide consent.
- Post-operative cases
- Patients who had no history of knee pain but underwent MRI of the knee

Methodology : Patients referred to the Dept. of Radio-diagnosis, Jehangir Hospital, for MR knee joint were

matched with the inclusion criteria, those matching any of the exclusion criteria were excluded from the study.

A detailed clinical history was taken. This includes present complaints, past history and their sequence of occurrence in already diagnosed cases. Inspection of the knee joint was done for swelling or any deformity of the knee joint.

Statistical methods: All the data was recorded as per the decided study proforma. Descriptive statistics with univariate analysis was used to quantitatively describe or summarize features of collection of information from a given sample of 100 patients using tables, graphs, charts, proportions and percentages.

Results

Table 1: Distribution of cases according to cruciate ligament injury

Cruciate ligament injury	MD	IE	PT	FTT	Total	Percentage (%)
ACL	0	12	10	15	47	90.38
PCL		2	1	1	5	9.62

Out of 100 patients, 52 were diagnosed to have cruciate ligament injury. Out of 52 having cruciate ligament injury, 47 were diagnosed to have ACL injury and 5 were diagnosed to have PCL injury. Out of 47 patients having ACL injury 10 had MD, 12 had IE, 10 had PT and 15 had FTT. Out of 5 patients having PCL injury 1 had MD, 2 had IE, 1 had PT and 1 had FTT.

Table 2: Distribution of cases according to collateral ligament injury

Collateral ligament injury	Grade I	Grade II	Grade III	Total	Percentage (%)
MCL	4	5	1	10	45.45
LCL	2	9	1	12	54.54

Out of 100 patients, 22 were diagnosed to have collateral ligament injury. Out of 22 having collateral

ligament injury, 10 were diagnosed to have MCL injury and 12 were diagnosed to have LCL injury. These were further classified as grade I, II and III. Out of 10 patients having MCL injuries, 4 had grade I, 5 had grade II and 1 had grade III injury. Out of 12 patients having LCL injuries 2 had grade I, 9 had grade II and 1 had grade III injury.

Discussion

Out of 100 patients, 52 (52%) were diagnosed to have cruciate ligament injury. Out of 52 having cruciate ligament injury 47 (90.38%) were diagnosed to have ACL injury and 5 (9.62%) were diagnosed to have PCL injury. These were further classified in MD, IE, PT and FTT. Out of 47 patients having ACL injury 10 (21.27%) had MD, 12 (25.54%) had IE, 10 (21.27%) had PT and 15 (31.92%) had FTT. Out of 5 patients having PCL injury 1 had MD, 2 had IE, 1 had PT and 1 had FTT. Chaudhari et al.³ in their study of 162 patients found 43 patients (27%) had interstitial sprain, with the remaining 38 (23%) patients had complete tear, 33 (20%) patients had mucoid degeneration, 27 (17%) had partial tear and 14 (9%) had high grade partial tear, however 7 patients (4%) had normal ACL.

Out of 100 patients 22 were diagnosed to have collateral ligament injury. Out of 22 having collateral ligament injury, 10 (45.46%) were diagnosed to have MCL injury and 12 (54.54%) were diagnosed to have LCL injury. These were further classified in grade I, II and III. Out of 10 patients having MCL injury 4 (40%) had grade I, 5 (50%) had grade II and 1 (10%) had grade III injury. Out of 10 patients having MCL injury 6 (60%) had bone bruise. Mark E. Schweitzer et al.⁴ evaluated multiple signs, prevalence and location of associated bone bruises associated with MCL tears on MR imaging. A study was conducted on 76 patients

found that maximum number of patients with knee pain who had MCL tears belonged to grade II. Bone bruises were seen in 24%. Out of 10 patients having MCL injury 6 (60%) had bone bruise. Out of 12 patients having LCL injury, 2 (16.67%) had grade I, 9 (75%) had grade II and 1 (8.37%) had grade III injury. Out of 12 patients having LCL injury, 3 (25%) had bone bruise.

O'Donoghue's triad (anterior cruciate ligament with medial meniscal and medial collateral ligament tear) was seen in 2 patients.

Conclusion

In our study, ACL injury was more common.

References

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