

## To Study the Role of MRI in Meniscal Injuries of Knee: A Cross Sectional Study

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## Abstract

## Original Research Article

**Background:** MRI has clearly emerged as the primary imaging tool in the workup of knee joint pathology. MRI has made it possible to look into the injured knee non-invasively thereby avoiding invasive procedures and further morbidity. The main indication of MRI is in assessment of meniscal and ligament injuries. However it is useful in demonstrating other knee joint abnormalities involving articular cartilage, bone marrow, synovium, patellofemoral joint and adjacent soft tissue. MRI has been proven to be effective in defining the various knee structures and has proved to be an imaging modality in defining damage to these structures thus providing an aid in planning the treatment if needed. **Aim:** To study the role of MRI in meniscal injuries of knee. **Material and methods:** A cross sectional study was carried out among patients presenting with history of knee injury, who were referred to radiology department of Dr. Balasaheb Vikhe Patil Rural Medical College for MRI Knee. Patients giving consent to be included in the study, having no cardiac pacemakers, metallic implants in body and not claustrophobic were enrolled and studied. Thus such 30 cases were studied. Data was collected and compiled in Microsoft excel and data was analysed using open epi version 2.3.1. **Results:** Mean age was 32.4±12.3 years. 65% were males and 35% were females. 64% had meniscal tear on MRI. Among them 70% had medial meniscal tear and 30% had lateral meniscal tear. **Conclusion:** MRI has been proven to be effective in defining the various knee structures such as ligaments, tendons, menisci, cartilage, musculature and the soft tissues and has proved to be an imaging modality in defining damage to these structures, thus providing an aid in planning the treatment if needed. **Keywords:** MRI, bone marrow, synovium, Injuries of Knee.

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## INTRODUCTION

The knee is a complex joint with a number of internal structures, all of which can give rise to symptoms in knee injuries. MRI is a non invasive modality and has replaced conventional arthrography in the evaluation of the menisci and cruciate ligaments. It has decreased both the morbidity and the cost associated with the arthroscopic examination that yields negative results [1, 2].

In addition, three dimensional (3D) volume techniques have demonstrated the versatility of MR

imaging in the evaluation of meniscal tears. It can be used to reformat images of meniscal tears in orthogonal and non orthogonal planes. Soft tissue discrimination with MR imaging is excellent and differentiation can be made among cortex, marrow, ligaments, tendons, muscles, synovium, and vascular and cartilage elements. This differentiation is not possible with conventional radiographic techniques [3, 4].

**Aim:** To study the role of MRI in meniscal injuries of knee.

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## MATERIAL AND METHODS

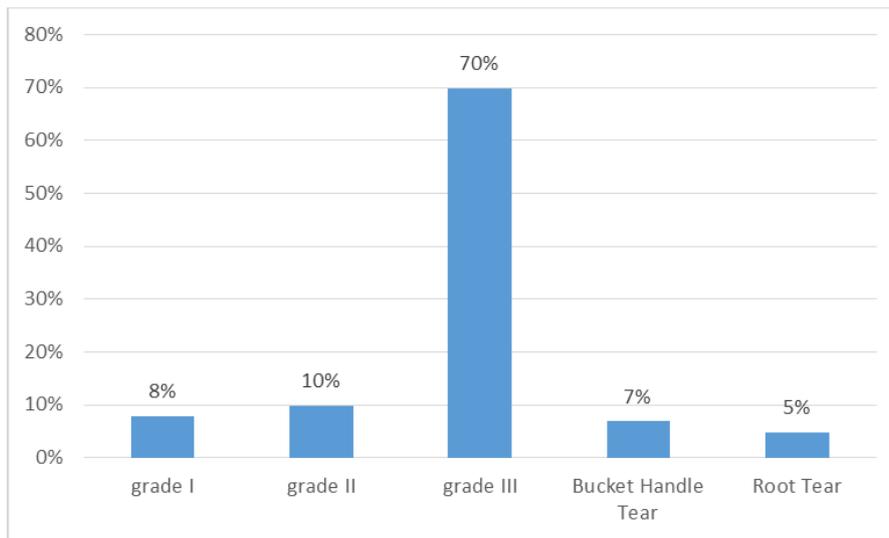
A cross sectional study was carried out among patients presenting with history of knee injury, who were referred to radiology department of Dr. Balasaheb Vikhe Patil Rural Medical College for MRI Knee. Patients giving consent, having no cardiac pacemakers, metallic implants in body and not claustrophobic were enrolled and studied. Thus such 30 cases were studied.

Patient was placed in supine position with the knee in a closely coupled extremity coil. The knee was externally rotated 15-20°, in order to facilitate the visualization of ACL completely on sagittal images as it

realigns the ACL parallel with the sagittal imaging plane. The knee was flexed slightly 5-10° to increase the accuracy of assessing the patella-femoral compartment and patellar alignment. Data was collected and compiled in Microsoft excel and data was analysed using openepi version 2.3.1.

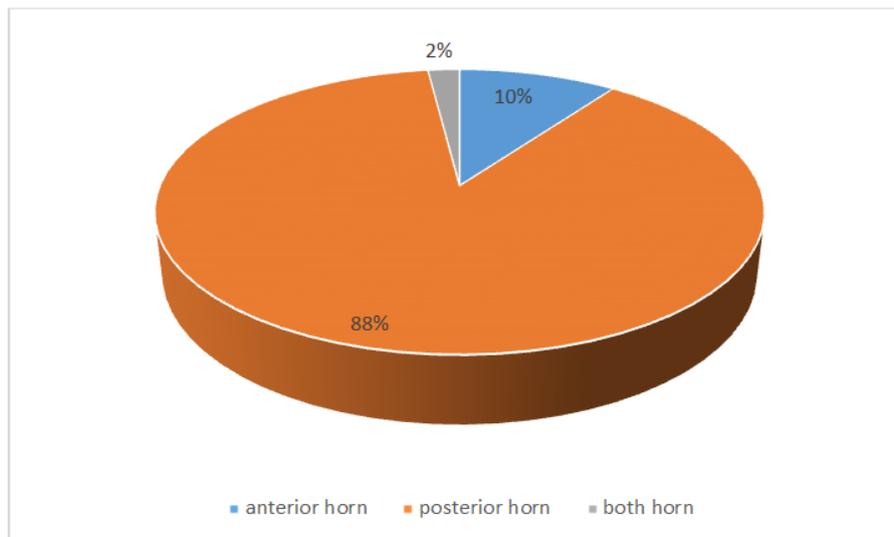
## RESULTS

Mean age was 32.4+12.3 years. 65% were males and 35% were females. 64% had meniscal tear on MRI. Among them 70% had medial meniscal tear and 30% had lateral meniscal tear.

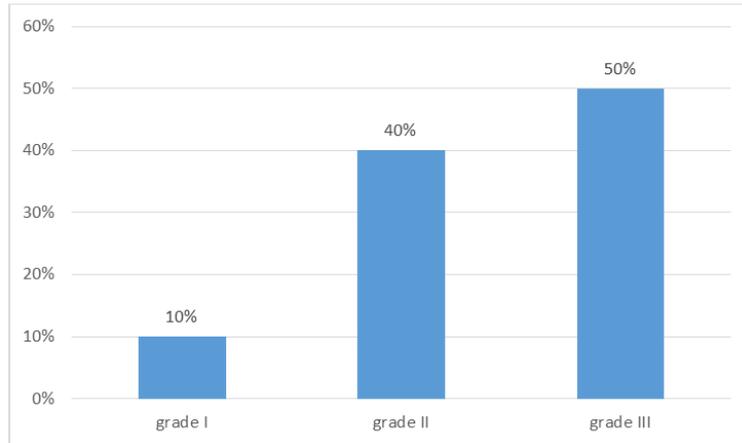


**Figure 1: Grades of medial meniscal tear**

On MRI majority 70% had grade III tear of medial meniscus (Figure 1). Among those majority were posterior horn 88% (Figure 2).

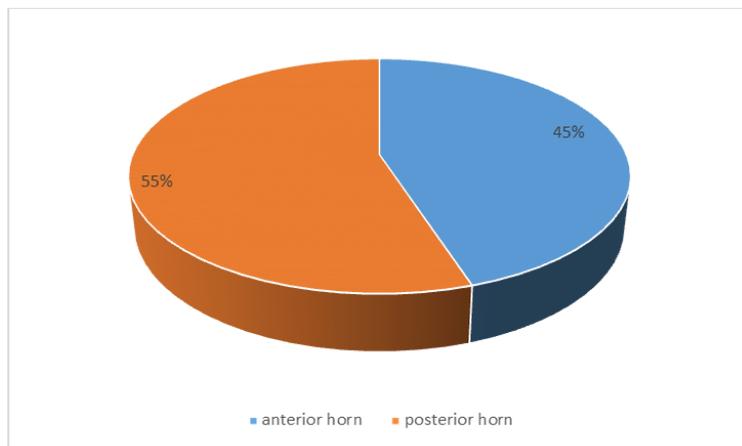


**Figure 2: Medial meniscus grade III tear**



**Figure 3: Grades of Lateral meniscal tear**

Even in lateral meniscal tear majority were grade III of lateral meniscus (Figure 3) and among them posterior horn was majorly affected (Figure 4).



**Figure 4: Lateral meniscus grade III tear**

64% cases had synovial effusion in the central joint space and suprapatellar recess.

**MRI images of Meniscal injury**





## DISCUSSION

Mean age was 32.4+12.3 years. 65% were males and 35% were females. 64% had meniscal tear on MRI. Among them 70% had medial meniscal tear and 30% had lateral meniscal tear. Lakhar *et al.*, [5] who in their study on 173 patients showed 57 (38.23%) cases with medial meniscal tears and 28 cases (29.41%) with lateral meniscal tears. Also La Prade and colleagues [6] reported that medial meniscal tears are twice as

common as lateral meniscal tears. D S Shetty *et al.*, [7] in their study also reported medial meniscal tears to be more common than lateral meniscal tears. In present study on MRI, majority 70% had grade III tear. Among those majority were posterior horn 88%. Even in lateral meniscal tear majority were grade III and among them posterior horn was majorly affected. Stoller DW *et al.*, [8] in their study showed grade II medial meniscal tears to be more common. Lakhar *et al.*, [5] who in their

study stated that posterior horn meniscal tears were more common than anterior horn.

In present study 64% cases had synovial effusion in the central joint space and suprapatellar recess. Kaneko K *et al.*, [9] stated that fluid preferentially accumulates in the suprapatellar recess and central portions of the joint in the traumatized knee. David W. Stoller *et al.*, [8] described that a fat–serum–sediment level in lipohemarthrosis is often associated with severe bone contusion and fracture.

## CONCLUSION

MRI has been proven to be effective in defining the various knee structures such as ligaments, tendons, menisci, cartilage, musculature and the soft tissues and has proved to be an imaging modality in defining damage to these structures thus providing an aid in planning the treatment if needed.

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