

Original Research Article

Comparing the findings of clinical examination versus magnetic resonance imaging for the diagnosis of ligamentous injuries of knee in rural area

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ABSTRACT

Background: The knee is a complex synovial joint allowing flexion, extension, anteroposterior gliding and internal-external rotation. The major articular surfaces are the medial and lateral condyles of the femur and patellar surface. The aim of the study was to compare the findings of clinical examination versus magnetic resonance imaging (MRI) for the diagnosis of ligamentous injuries of knee in rural area.

Methods: Present study was an observational study carried out at rural medical college under orthopaedic department. All patients coming with ligamentous injury to orthopaedic department were studied. Thus such 50 cases were studied. All cases were referred to radiology department for MRI of knee. MRI reports and clinical reports were compared and analysis was done. Cases contraindicated for MRI examination were excluded from study. General demographic history, clinical presentation and MRI reports were recorded. All data was compiled in Microsoft excel and analysed using OpenEPI 2.3.1.

Results: Mean age was 46.4 ± 11.2 years. Majority were males 70% and 30% were females. Swelling 62% was most commonly seen followed by knee pain. Majority 58% cases had grade 3 tear on MRI, followed by 36% had grade II and only 6% had grade I.

Conclusions: MRI is an excellent, non-invasive, radiation free imaging modality with multilane capabilities and excellent soft tissue delineation. It can accurately detect, localize and characterize various internal derangements of the knee joint and help in arriving at a correct anatomical diagnosis thereby guiding further management of the patient.

Keywords: Clinical examination, MRI, Ligamentous injuries, Knee

INTRODUCTION

The knee is a complex synovial joint allowing flexion, extension, anteroposterior gliding and internal-external rotation. The major articular surfaces are the medial and lateral condyles of the femur and patellar surface. Four bands of tissue, the anterior and posterior cruciate ligaments, and the medial and lateral collateral ligaments connect the femur and the tibia and provide joint stability. Strong thigh muscles give the knee, strength and mobility. Semicircular rings of tough fibrous-cartilage tissue called

the lateral and medial menisci act as shock absorbers and the bones of the knee are surrounded by a thin, smooth tissue capsule lined by a thin synovial membrane which releases a special fluid that lubricates the knee, reducing friction to nearly zero in a healthy knee.¹

Common anatomic structures that can mimic a tear include the transverse meniscal ligament, menisofemoral ligaments (MFLs), popliteomeniscal fascicles, and meniscomeniscal ligament. Multi-ligament knee injuries (MLKIs) are rare but serious injuries that are usually

caused by high-energy trauma. Early detection of injured structures is crucial for the management of MLKIs, magnetic resonance imaging (MRI) is the necessary preoperative imaging examination, which is also valuable in detecting nerve injuries.²⁻⁵ Present study was carried out to compare the findings of clinical examination versus MRI for the diagnosis of ligamentous injuries of knee in rural area.

Aim

The aim of the study was to compare the findings of clinical examination versus MRI for the diagnosis of ligamentous injuries of knee in rural area.

METHODS

Study type

Present study was an observational study.

Study place

Carried out at Pravara Rural Medical College, Loni under orthopedic department.

Study duration

Study was carried out for duration of 2 years. October 2020 to October 2022.

Selection criteria

The selection criteria was all cases having recent ligamentous injury, age>18 years, and both genders.

Study population

All patients coming with ligamentous injury to orthopaedic department were studied.

Sample size

Thus such 50 cases were studied. Simple random sampling was used (sample size was calculated using open epi software)

Procedure

All cases were referred to radiology department for MRI of knee. MRI reports and clinical reports were compared and analysis was done. Cases contraindicated for MRI examination were excluded from study. General demographic history, clinical presentation and MRI reports were recorded.

Ethics

Ethical approval was taken prior to start of study.

Data analysis

All data was compiled in Microsoft excel and analysed using Ope Epi 2.3.1.

RESULTS

Mean age was 46.4±11.2 years.

Majority were males 70% and 30% were females. Swelling 62% was most commonly seen followed by knee pain. Majority 58% cases had grade 3 tear on MRI, followed by 36% had grade II and only 6% had grade I.

Table 2 shows that MRI sensitivity=91.11%, specificity=80%, positive predictive value=97.62%, negative predictive value=50%, accuracy=90%, p<0.001 HS.

Table 1: Age distribution.

Age in years	Frequency	Percentage
<40	12	24
>40	38	76
Total	50	100

Table 2: Comparison between ligament tear on MRI and clinical diagnosis.

Ligament tear on MRI	Clinical examination		Total
	Positive	Negative	
MRI positive	41	1	42
MRI negative	4	4	8
Total	45	5	50

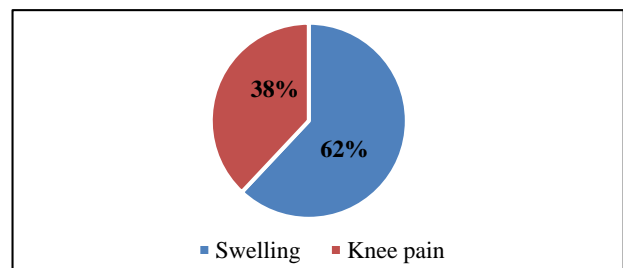


Figure 1: Clinical features.

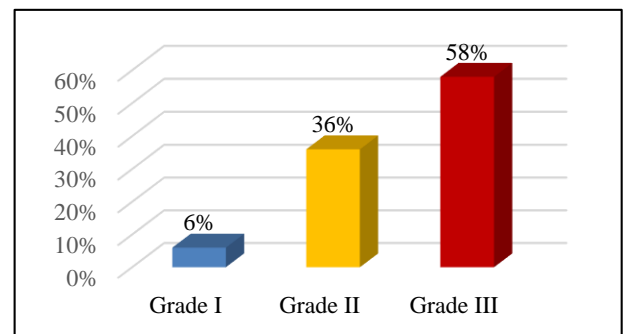


Figure 2: Ligament tear.

DISCUSSION

Study by Li et al also showed male preponderance.⁷ Madhusudhan et al showed that 68% were males and mean age was 52 years and majority cases had swelling as most common complaints.⁹

Similar findings were seen by Ruth et al that MRI is highly accurate in diagnosing meniscal and anterior cruciate ligament (ACL) tears.⁵ It is the most appropriate screening tool before therapeutic arthroscopy. Study by Meyer et al found that interestingly, preoperative clinical examination was slightly inferior to stress radiography in the detection of MCL lesions.⁶ However, clinical testing under general anaesthesia performed similar to stress radiography. The methodological quality analysis showed a low risk of bias regarding patient selection and index testing in each imaging modality. MRI was found to have high sensitivity (90.7%) and moderate specificity (63.6%) in the diagnosis of injuries to the ACL; high sensitivity (90.4%) and moderate specificity (50%) in the diagnosis of injuries to the PCL.⁷

Siddiqui et al showed there were only marginal differences in sensitivity and specificity of clinical examination and MRI in diagnosis of lateral meniscal and ACL injury.⁸

Limitation

Sample size was less. If such studies will be carried out among more number of cases we can have good knowledge about various clinical presentations of cases. Even the study is conducted in a rural area. It can be done in rural as well as urban area.

CONCLUSION

MRI is an excellent, noninvasive, radiation free imaging modality with multilane capabilities and excellent soft tissue delineation. It can accurately detect, localize and characterize various internal derangements of the knee joint and help in arriving at a correct anatomical diagnosis thereby guiding further management of the patient. MRI should be the initial investigation of choice after clinical examination in the evaluation of all cases of knee joint injuries. Because it can detect both intra and extra articular pathologies and also osseous structures. Based on the findings of MRI it acts as road map for further management.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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