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Diagnostic Accuracy of Magnetic Resonance Imaging Signs for Detecting Meniscal Root Tears: A Prospective Comparison with Arthroscopic Findings

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Learning Point of the Article:

MRI demonstrated high sensitivity and diagnostic accuracy for detecting meniscal root tears compared with arthroscopy. Characteristic signs, particularly the ghost sign, truncation sign, and meniscal extrusion, may improve pre-operative diagnosis and facilitate timely management.

Abstract

Introduction: Meniscal root tears (MRTs) are increasingly recognized as significant injuries that compromise knee biomechanics and accelerate cartilage degeneration if left untreated. Magnetic resonance imaging (MRI) is widely used for the pre-operative assessment of MRTs; however, knee arthroscopy remains the gold standard for definitive diagnosis. Evaluating the diagnostic accuracy of MRI is essential for improving early detection and treatment planning.

Objectives: The objective of the study is to evaluate the diagnostic accuracy of MRI signs in predicting MRTs using knee arthroscopy as the reference standard.

Materials and Methods: A prospective observational diagnostic accuracy study was conducted among 50 patients with clinically suspected MRTs at a tertiary care hospital. All participants underwent pre-operative MRI followed by knee arthroscopy. MRI findings, including ghost sign, truncation sign, radial tear, meniscal extrusion, and associated abnormalities, were compared with arthroscopic findings. Arthroscopy served as the gold standard for diagnosis. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), overall diagnostic accuracy, and Chi-square test were calculated using IBM Statistical Package for the Social Sciences Statistics Version 29.0.

Results: Among the 50 patients, the majority were males (64.0%) and belonged to the 31–40 years age group (30.0%). Arthroscopy confirmed MRTs in 33 (66.0%) patients. MRI correctly identified 30 true-positive, 14 true-negative, 3 false-positive, and 3 false-negative cases. MRI demonstrated a sensitivity of 90.9%, specificity of 82.4%, PPV of 90.9%, NPV of 82.4%, and an overall diagnostic accuracy of 88.0%. A statistically significant association was observed between MRI and arthroscopic findings ($\chi 2 = 28.64$, $P < 0.001$).

Conclusion: MRI demonstrated high diagnostic accuracy in predicting MRTs and showed excellent agreement with arthroscopic findings. Recognition of characteristic MRI signs can facilitate early diagnosis, appropriate surgical planning, and timely management. Nevertheless, arthroscopy remains the definitive diagnostic modality in clinically suspicious or inconclusive cases.

Keywords: Diagnostic accuracy, knee arthroscopy, magnetic resonance imaging, meniscal root tear, meniscus injury.

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Introduction

The knee joint is one of the most complex and frequently injured joints in the human body, playing a vital role in weight-bearing, stability, and mobility. The menisci are fibrocartilaginous structures located between the femur and tibia that function to distribute load, absorb shock, enhance joint stability, facilitate lubrication, and protect the articular cartilage. Preservation of meniscal integrity is essential for maintaining normal knee biomechanics and preventing premature degenerative changes. Injury to the meniscus, particularly the meniscal root, can significantly impair its biomechanical function and accelerate the progression of osteoarthritis if left untreated [1].

Meniscal root tears (MRTs) are defined as radial tears occurring within 1 cm of the meniscal root attachment or avulsion of the meniscal root from its tibial insertion. These injuries disrupt the circumferential collagen fibers responsible for converting axial loads into hoop stresses, resulting in extrusion of the meniscus and increased contact pressure on the articular cartilage. Consequently, untreated MRTs can lead to rapid cartilage degeneration, joint space narrowing, and early-onset osteoarthritis, making timely diagnosis and appropriate management essential [2].

The clinical presentation of MRTs is often non-specific and may include knee pain, swelling, locking, instability, or reduced range of motion. Because these symptoms overlap with other intra-articular pathologies, clinical examination alone is insufficient for establishing a definitive diagnosis. Conventional physical examination tests have limited sensitivity and specificity for detecting meniscal root injuries, emphasizing the need for advanced imaging techniques to improve diagnostic accuracy before surgical intervention [3].

Magnetic resonance imaging (MRI) has become the imaging modality of choice for evaluating soft tissue injuries of the knee due to its excellent contrast resolution and multiplanar imaging capability. MRI enables detailed visualization of the menisci, ligaments, cartilage, bone marrow, and surrounding soft tissues without exposure to ionizing radiation. It provides comprehensive assessment of meniscal morphology and allows identification of characteristic imaging signs associated with MRTs, thereby assisting clinicians in planning appropriate treatment strategies [4].

Several characteristic MRI signs have been described for diagnosing MRTs. These include the ghost meniscus sign on sagittal images, truncation sign on coronal sections, radial linear defect, meniscal extrusion >3 mm, cleft sign, giraffe neck sign, and associated bone marrow edema. Recognition of these imaging features can improve diagnostic confidence and facilitate early referral for arthroscopic management. However, the sensitivity and specificity of individual MRI signs may vary depending on image quality, tear location, chronicity of injury, and radiologist experience [5].

Despite continuous advancements in MRI technology, certain MRTs remain difficult to identify, particularly partial tears, chronic lesions, and post-operative changes. False-negative findings may delay appropriate treatment, whereas false-positive interpretations may result in unnecessary surgical procedures. Therefore, understanding the diagnostic performance of specific MRI signs remains an important aspect of musculoskeletal imaging and orthopedic practice [6].

Knee arthroscopy is widely regarded as the gold standard for confirming MRTs because it permits direct visualization of the meniscal attachment, assessment of tear morphology, and simultaneous therapeutic intervention. Arthroscopic findings provide the definitive diagnosis against which MRI interpretations are compared when evaluating diagnostic accuracy. Correlating MRI findings with arthroscopic observations helps determine the reliability of different MRI signs and supports evidence-based clinical decision-making [7].

Accurate pre-operative diagnosis of MRTs is particularly

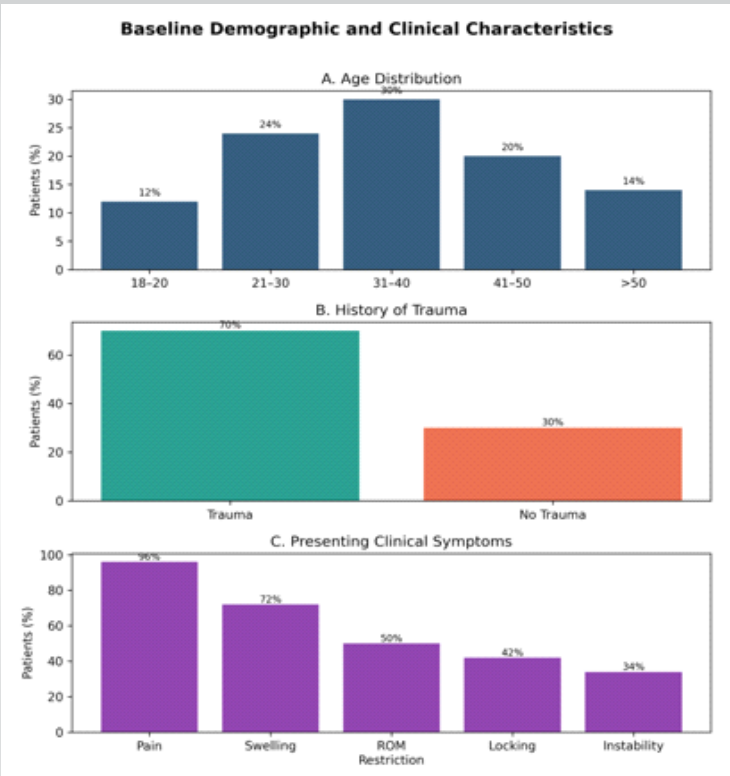

Figure 1: Baseline demographic and clinical characteristics of patients with suspected meniscal root tears, including age distribution, history of trauma, and presenting clinical symptoms

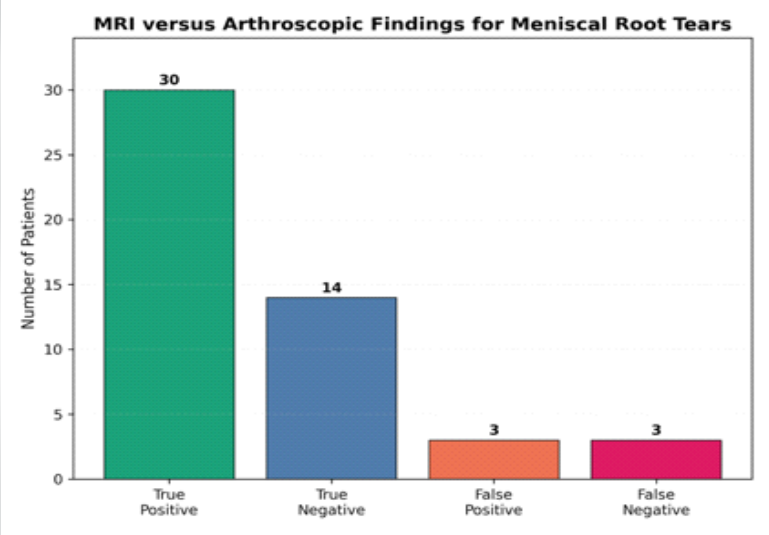

Figure 2: Comparison of magnetic resonance imaging and arthroscopic findings for the diagnosis of meniscal root tears, demonstrating true-positive, true-negative, false-positive, and false-negative cases

important because treatment options vary according to tear type, chronicity, cartilage status, and patient characteristics. Early identification allows timely meniscal root repair, which has been shown to restore knee biomechanics, reduce meniscal extrusion, preserve cartilage, and delay the progression of osteoarthritis. Conversely, delayed or missed diagnosis may result in irreversible joint degeneration and inferior functional outcomes [8].

Evaluation of MRI diagnostic accuracy involves assessment of sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall accuracy using arthroscopic findings as the reference standard [9]. These statistical measures provide valuable information regarding the clinical usefulness of MRI signs and help determine which imaging features are most reliable in routine orthopedic practice. Improved diagnostic accuracy enhances surgical planning, optimizes patient selection for repair procedures, and minimizes unnecessary interventions [10].

The present study aims to evaluate the diagnostic accuracy of various MRI signs in predicting MRTs by comparing pre-operative MRI findings with arthroscopic confirmation. Establishing the reliability of these imaging markers may contribute to earlier diagnosis, improved treatment planning, better preservation of knee function, and enhanced long-term clinical outcomes in patients with suspected meniscal root injuries.

Materials and Methods

Study design

This prospective observational diagnostic accuracy study was conducted over a period of 18 months in the Department of Radiodiagnosis in collaboration with the Department of Orthopaedics at a tertiary care teaching hospital. Adult patients presenting with clinical suspicion of MRTs who underwent pre-operative MRI followed by diagnostic or therapeutic knee arthroscopy were consecutively enrolled. Knee arthroscopy served as the reference standard for confirming the diagnosis of MRTs and evaluating the diagnostic performance of MRI. The study protocol was approved by the Institutional Ethics Committee, and written informed consent was obtained from all participants before enrollment.

Inclusion criteria

- Adult patients aged 18 years and above
- Patients with clinical suspicion of MRT
- Patients who underwent pre-operative MRI of the affected knee
- Patients who subsequently underwent diagnostic or therapeutic knee arthroscopy
- Patients willing to provide written informed consent.

Exclusion criteria

- Previous knee surgery on the affected side
- Acute fractures around the knee
- Advanced osteoarthritis causing distorted joint anatomy

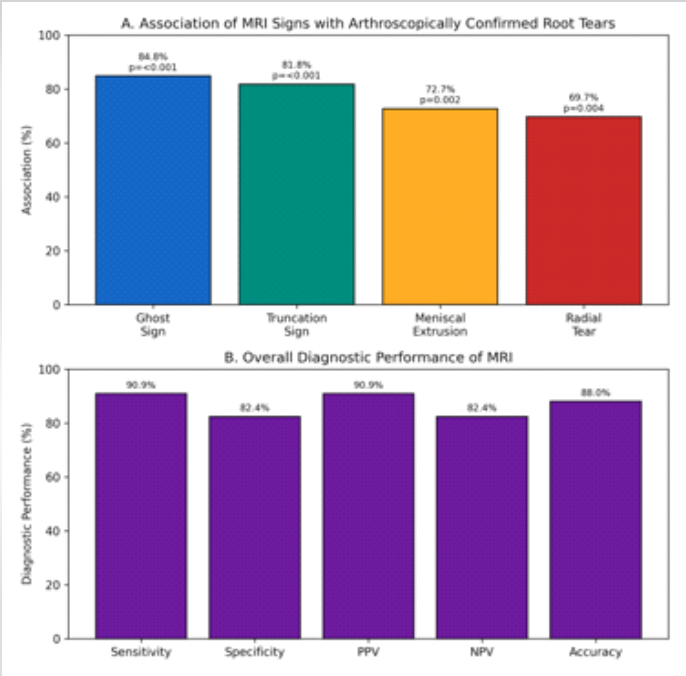

Figure 3: Diagnostic performance of magnetic resonance imaging (MRI) and association of characteristic MRI signs (ghost sign, truncation sign, meniscal extrusion, and radial tear) with arthroscopically confirmed meniscal root tears

Table 1: Baseline demographic and clinical characteristics of the study population (n=50)

Variable	Category	Frequency	Percentage
Age group (years)	18–20	6	12
	21–30	12	24
	31–40	15	30
	41–50	10	20
	>50	7	14
Gender	Male	32	64
	Female	18	36
Side involved	Right	29	58
	Left	21	42
History of trauma	Present	35	70
	Absent	15	30
Presenting symptoms	Knee pain	48	96
	Swelling	36	72
	Restricted ROM	25	50
	Locking	21	42
	Instability	17	34

ROM: Range of motion

- Inflammatory or infective arthritis
- Poor-quality MRI images unsuitable for interpretation
- Patients refusing consent or lost to follow-up before arthroscopy.

Study sampling

A consecutive sampling technique was employed throughout the study period. All eligible patients fulfilling the inclusion criteria were recruited consecutively until the desired sample size was attained. Consecutive sampling minimized selection bias by ensuring that every eligible patient presenting during the study period had an equal opportunity to participate. Patient enrollment continued without interruption until the predetermined number of participants was achieved.

Study sample size

The study included a total sample size of 50 patients. The sample size was determined based on the expected number of eligible patients presenting to the study center during the study period and the feasibility of obtaining both MRI and arthroscopic confirmation for each participant. All fifty patients completed the diagnostic evaluation and were included in the final statistical analysis.

Study parameters

The study evaluated various demographic, clinical, radiological, arthroscopic, and diagnostic accuracy parameters. Demographic variables included the patients' age and gender, while clinical parameters comprised the side of the knee involved, clinical presentation, duration of symptoms, and history of trauma. MRI evaluation included assessment of characteristic imaging findings such as the ghost meniscus sign, truncation sign, radial linear defect, meniscal extrusion, cleft sign, associated ligament injuries, cartilage abnormalities, and bone marrow edema. Arthroscopic examination was performed as the reference standard to determine the presence, type, and location of MRTs. The diagnostic performance of MRI was assessed by calculating sensitivity, specificity, PPV, NPV, and overall diagnostic accuracy through comparison of MRI findings with arthroscopic findings.

Study procedure

Patients attending the orthopedic outpatient department with symptoms suggestive of meniscal injury were initially evaluated through detailed history taking and clinical examination. Those fulfilling the eligibility criteria underwent MRI of the affected knee before arthroscopic intervention. MRI examinations were performed using a standardized knee MRI protocol on a (1.5-T/3-T) system. The protocol included sagittal, coronal, and axial (T1-weighted, proton-density/proton-density fat-suppressed, and T2-weighted/T2-fat-suppressed) sequences with a slice thickness of approximately (X) mm. Images were reviewed for ghost sign, truncation sign, radial linear defect, meniscal extrusion, and associated intra-articular abnormalities. MRI interpretation was performed by experienced radiologists who were blinded to arthroscopic

Table 2: MRI findings and arthroscopic correlation in meniscal root tears

Parameter	Frequency	Percentage
Ghost sign	31	62
Truncation sign	29	58
Meniscal extrusion	27	54
Radial tear	26	52
Bone marrow edema	18	36
Arthroscopically confirmed root tear	33	66
True positive	30	—
True negative	14	—
False positive	3	—
False negative	3	—

Table 3: Diagnostic performance of MRI and association of MRI signs with arthroscopically confirmed meniscal root tears

Parameter	Value
Sensitivity	90.90%
Specificity	82.40%
Positive predictive value	90.90%
Negative predictive value	82.40%
Overall diagnostic accuracy	88.00%
Ghost sign	$P<0.001$
Truncation sign	$P<0.001$
Meniscal extrusion	$P=0.002$
Radial tear	$P=0.004$

MRI: Magnetic resonance imaging

findings. The MRI images were independently interpreted by experienced radiologists who were blinded to the arthroscopic findings. Characteristic MRI signs suggestive of MRTs, including the ghost sign, truncation sign, radial tear, meniscal extrusion, and associated abnormalities, were documented.

Following MRI evaluation, all patients underwent knee arthroscopy performed by experienced orthopedic surgeons. Arthroscopic examination served as the reference standard for confirming the presence or absence of MRTs. The location, type, and extent of the tear were carefully documented. MRI findings were subsequently correlated with arthroscopic findings to determine the diagnostic accuracy of individual MRI signs.

Study data collection

Data were collected using a structured case record form prepared specifically for the study. Demographic information, clinical history, physical examination findings, MRI observations, and arthroscopic findings were recorded prospectively. MRI reports included evaluation of specific imaging signs associated with MRTs. Arthroscopic reports documented the definitive diagnosis and associated intra-articular abnormalities. All collected information was cross-verified for completeness before entry into the study database. Patient confidentiality was maintained by assigning unique identification numbers to each participant.

Data analysis

Diagnostic performance of MRI was assessed by calculating sensitivity, specificity, PPV, NPV, overall diagnostic accuracy, and positive and negative likelihood ratios, with corresponding 95% confidence intervals (Cis). Agreement between MRI and arthroscopic findings was assessed using Cohen's kappa coefficient. Associations between categorical variables were evaluated using the Chi-square test or Fisher's exact test, as appropriate. A $P < 0.05$ was considered statistically significant. Receiver operating characteristic analysis was not performed because MRI findings were assessed as categorical qualitative variables without a continuous diagnostic score.

Results

A total of 50 patients with clinically suspected MRTs who underwent pre-operative MRI followed by knee arthroscopy were included in the study. The majority of participants were males (64.0%), with the highest proportion belonging to the 31–40-year age group (30.0%). The right knee was involved in 58.0% of patients, and a history of trauma was present in 70.0%. Knee pain was the most common presenting symptom (96.0%), followed by swelling (72.0%), restricted range of motion (50.0%), locking (42.0%), and instability (34.0%), reflecting the typical clinical presentation of meniscal root injuries (Table 1 and Fig. 1).

MRI evaluation demonstrated that the ghost sign was the most frequent imaging finding (62.0%), followed by the truncation sign (58.0%), meniscal extrusion (54.0%), radial linear tear (52.0%), and bone marrow edema (36.0%). Arthroscopy, used as the reference standard, confirmed MRTs in 33 (66.0%) patients. MRI correctly identified 30 true-positive, 14 true-negative, 3 false-positive, and 3 false-negative cases, demonstrating excellent agreement with arthroscopic findings (Table 2 and Fig. 2).

MRI demonstrated a sensitivity of 90.9% (95% CI, 76.4–96.9%), specificity of 82.4% (95% CI, 59.0–93.8%), PPV of 90.9% (95% CI, 76.4–96.9%), NPV of 82.4% (95% CI, 59.0–93.8%), and overall diagnostic accuracy of 88.0% (95% CI, 76.2–94.4%). The positive and negative likelihood ratios were 5.15 and 0.11, respectively. Agreement between MRI and arthroscopy was substantial (Cohen's $\kappa = 0.73$). The association between MRI and arthroscopic findings remained statistically significant ($\chi 2 = 28.64$, $P < 0.001$). Meniscal extrusion (72.7% vs. 17.6%; $P = 0.002$) and radial tear (69.7% vs. 17.6%; $P = 0.004$) were also significantly associated with positive arthroscopic findings, confirming their value as reliable MRI indicators of MRTs (Table 3 and Fig. 3).

Among the 33 arthroscopically confirmed MRTs, the posterior root of the medial meniscus was the most commonly affected location (72.7%), followed by the posterior root of the lateral

Table 4: Distribution of meniscal root tear location and associated MRI findings

Parameter	Frequency	Percentage
Tear location		
Posterior medial root	24	72.7
Posterior lateral root	7	21.2
Anterior root	2	6.1
Associated MRI findings		
Bone marrow edema	18	36
ACL injury	12	24
Cartilage defect	10	20
MCL injury	6	12
No associated abnormality	15	30

ACL: Anterior cruciate ligament, MCL: Medial collateral ligament, MRI: Magnetic resonance imaging

meniscus (21.2%) and the anterior root (6.1%). Bone marrow edema was the most frequent associated MRI abnormality (36.0%), followed by anterior cruciate ligament (ACL) injury (24.0%), cartilage defects (20.0%), and medial collateral ligament injury (12.0%), while 30.0% of patients had no associated intra-articular abnormality (Table 4).

Discussion

The present prospective observational diagnostic accuracy study evaluated the ability of MRI to predict MRTs using knee arthroscopy as the gold standard. A total of 50 patients with clinically suspected MRTs who underwent both MRI and arthroscopy were included. MRI demonstrated a sensitivity of 90.9%, specificity of 82.4%, PPV of 90.9%, NPV of 82.4%, and an overall diagnostic accuracy of 88.0%. Furthermore, MRI findings showed a highly significant association with arthroscopic findings ($\chi 2 = 28.64$, $P < 0.001$), indicating that MRI is a reliable non-invasive imaging modality for the pre-operative diagnosis of MRTs.

The demographic profile of the present study showed that the majority of patients belonged to the 31–40-year age group (30.0%), with males constituting 64.0% of the study population. The predominance of young and middle-aged adults observed in our study is consistent with the fact that meniscal injuries commonly occur in physically active individuals and those sustaining sports- or trauma-related knee injuries. Similarly, LaPrade et al. [11] included 287 patients with a mean age of 41.7 years, comprising 156 males and 131 females, thereby demonstrating that MRTs are frequently encountered among middle-aged adults with a slight male predominance, which is comparable to our findings.

Clinically, knee pain was the most common presenting symptom in our study (96.0%), followed by swelling (72.0%), restricted range of motion (50.0%), locking (42.0%), and instability (34.0%). These findings reflect the typical clinical manifestations associated with meniscal root injuries. However, clinical examination alone cannot reliably distinguish MRTs from other intra-articular knee pathologies. Therefore, advanced imaging remains essential for confirming the diagnosis before surgical intervention. This observation is supported by Antinolfi et al., [12], who evaluated 80 patients with suspected meniscal injuries using clinical examination, MRI, and arthroscopy. Although clinical examination performed by an experienced knee surgeon demonstrated excellent diagnostic performance for medial meniscal tears with 91% sensitivity, 87% specificity, 90% accuracy, 94% PPV, and 81% NPV, MRI showed comparatively lower values of 85% sensitivity, 75% specificity, 82% accuracy, 88% PPV, and 71% NPV. Their study concluded that experienced clinical assessment may equal or even surpass MRI for diagnosing meniscal injuries in selected patients. In contrast, the present study specifically evaluated MRTs, where MRI demonstrated considerably higher sensitivity and overall diagnostic accuracy, highlighting its important role in detecting these often subtle lesions.

The present study demonstrated that the ghost sign (62.0%) was the most common MRI finding, followed by the truncation sign (58.0%), meniscal extrusion (54.0%), and radial tear (52.0%). These MRI features are recognized as characteristic indicators of posterior meniscal root injuries. Similar findings were reported by Lee et al., [13] who retrospectively evaluated 39 arthroscopically confirmed medial MRTs. They observed that the ghost sign was present in 100% (36/36) of radial tears, the vertical linear defect on coronal images in 100% (36/36), and the radial linear defect on axial images in 94% (34/36). In addition, they reported a high prevalence of degenerative joint disease (97%), cartilage defects (89%), and meniscal extrusion (67%) associated with medial MRTs. Although the prevalence of individual MRI signs was comparatively lower in our study, the pattern of MRI findings closely resembles those described by Lee et al., [13] confirming that these imaging signs remain highly valuable in identifying MRTs.

Arthroscopy confirmed MRTs in 66.0% of patients in the present study and served as the reference standard for evaluating MRI performance. MRI correctly identified 30 true-positive, 14 true-negative, 3 false-positive, and 3 false-negative cases. Consequently, MRI achieved an overall diagnostic accuracy of 88.0%, supporting its reliability as a pre-operative imaging modality. Comparable findings were reported by Sharifah et al., [14] who prospectively evaluated 65 patients (66 knees) with ACL injuries. Their study reported MRI sensitivity, specificity, and accuracy of 82%, 92%, and 88%, respectively, for

medial meniscal tears, while for lateral meniscal tears these values were 83%, 97%, and 92%, respectively. The authors further observed five false-negative medial and four false-negative lateral meniscal tears, with most missed tears involving the peripheral posterior horns. They concluded that MRI possesses high NPV and remains a valuable investigation before arthroscopy, although posterior horn lesions may occasionally be overlooked. These findings closely parallel our results, particularly regarding the high diagnostic accuracy and occasional false-negative MRI examinations.

The diagnostic performance observed in the present study was also comparable with the findings of LaPrade et al., [11] specifically investigated the diagnostic accuracy of 3-Tesla MRI for posterior MRTs using arthroscopy as the gold standard. Their study demonstrated an overall sensitivity of 77.0%, specificity of 72.9%, PPV of 22.0%, and NPV of 97.0%. For medial MRTs, MRI achieved 82.4% sensitivity, 80.0% specificity, and 98.6% NPV, whereas for lateral root tears, sensitivity decreased to 60.0%, although specificity increased to 90.3%. Compared with these findings, the present study demonstrated higher sensitivity (90.9%) and overall accuracy (88.0%). The improved diagnostic performance in our study may be attributed to standardized MRI protocols, careful interpretation of characteristic MRI signs, and direct comparison with arthroscopic findings.

The findings of our study are also supported by the recently published systematic review and meta-analysis by Nguyen et al., [15] which included 75 studies involving 8,507 patients (8,517 knees). Their pooled analysis demonstrated a 91.0% sensitivity for medial meniscal tears and 78.5% sensitivity for lateral tears. In contrast, specificity was higher for lateral tears (94.0%) than medial tears (87.7%). The authors concluded that MRI consistently provides high diagnostic accuracy for detecting meniscal tears irrespective of study design and emphasized that combining meniscal signal intensity with morphologic distortion significantly improves diagnostic performance. The sensitivity of 90.9% observed in our study is remarkably consistent with the pooled sensitivity reported in this meta-analysis, thereby reinforcing the reliability of MRI in diagnosing MRTs.

The statistically significant association between MRI and arthroscopic findings ($P < 0.001$) observed in our study further supports the clinical usefulness of MRI as an effective screening and pre-operative planning tool. Although arthroscopy remains the definitive diagnostic method, MRI offers the advantages of being non-invasive, widely available, and capable of evaluating associated ligamentous, cartilaginous, and osseous abnormalities simultaneously. The present study therefore supports the routine use of MRI in patients with suspected MRTs while recognizing that equivocal or clinically suspicious cases should ultimately undergo arthroscopic confirmation. The present study demonstrated that MRI possesses excellent sensitivity, good specificity, and high overall diagnostic accuracy for detecting MRTs when compared with arthroscopy. The findings are consistent with previous literature and confirm that recognition of characteristic MRI signs, including the ghost sign, truncation sign, radial tear, and meniscal extrusion, substantially improves diagnostic confidence. Early and accurate MRI diagnosis facilitates appropriate surgical planning, timely meniscal root repair, and may help prevent progressive cartilage degeneration and early osteoarthritis.

This study has several limitations. First, the relatively small sample size of 50 patients may have reduced the precision of diagnostic estimates and limited generalizability. Second, the single-center design may limit applicability to different institutions, MRI protocols, and patient populations. Third, selection bias cannot be excluded because only patients with clinical suspicion of MRTs who subsequently underwent arthroscopy were included, resulting in an enriched disease prevalence of 66%. The exclusion of patients with previous knee surgery, advanced osteoarthritis, fractures, inflammatory or infective arthritis, and poor-quality MRI further limits external validity. Although MRI was interpreted by experienced radiologists blinded to arthroscopic findings, interobserver and intraobserver reliability were not assessed. Subgroup analyses according to medial versus lateral root tears, acute versus chronic presentation, and traumatic versus degenerative etiology were also not performed because of the limited sample size. In addition, the study did not evaluate whether MRI diagnostic findings influenced post-operative functional outcomes, meniscal healing, or osteoarthritis progression. Finally, although the MRI protocol was standardized within the study center, different MRI field strengths, sequences, and technical parameters were not compared. Larger multicenter studies with standardized MRI protocols, multiple blinded observers, appropriate subgroup analyses, and longitudinal clinical follow-up are warranted to validate these findings.

Conclusion

MRI demonstrated high sensitivity, specificity, and overall diagnostic accuracy for detecting MRTs compared with arthroscopy. The ghost sign, truncation sign, meniscal extrusion, and radial tear were significantly associated with arthroscopically confirmed tears. MRI therefore represents a valuable non-invasive pre-operative diagnostic tool, although arthroscopy remains the reference standard in clinically suspicious or inconclusive cases.

Clinical Message

MRI should be considered the primary imaging investigation in patients with suspected MRTs because it provides accurate pre-operative assessment and helps guide surgical planning. However, as some tears may still be missed on MRI, knee arthroscopy remains the gold standard for definitive diagnosis, particularly in patients with persistent clinical suspicion despite inconclusive imaging findings.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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