

SENSITIVITY OF MAGNETIC RESONANCE IMAGING VERSUS ARTHROSCOPY AS GOLD STANDARD IN  
DIAGNOSIS OF  
CHONDRAL LESIONS OF THE KNEE IN ADULTS.



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## INTRODUCTION

Knee chondral lesions are an important area of Orthopaedic research because of their high prevalence, progressive nature and poor healing capacity.

Many authors agree that magnetic resonance imaging (MRI), with its different modalities, is still the best noninvasive procedure for detecting traumatic and nontraumatic cartilage defects, with a sensitivity that ranges from 0% to 100%, depending on the location, size, depth of the lesion, and the MRI sequence, field strength, and contrast agent used.

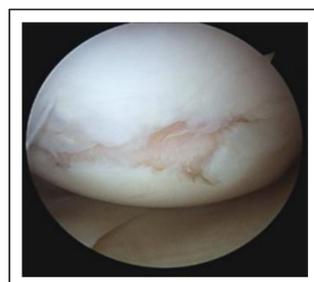
Whether MRI underestimates the number and size of knee Chondral lesions or not remains controversial. But still, arthroscopy remains the gold standard for the diagnosis of knee cartilage injuries.

## AIM

Objectives were to determine the sensitivity of MRI in diagnosing Chondral defects of knee in comparison to knee arthroscopy which is considered to be a gold standard in diagnosing knee chondral lesions

## METHODS

- This is a prospective study on 100 consecutive knee arthroscopic procedures performed between May 2019 and February 2020 by the same surgical team.
- The study group's age average was 29.7 years (14 to 42 years). The Indication for surgery included ligament tears, meniscal tears, knee pain.
- Patients without a preoperative MRI study were excluded.
- MRI reports were performed by qualified radiologists in all the cases.
- Chondral lesions were classified according to the International Cartilage Repair Society (ICRS) classification and were included in a database along with the MRI reports.
- The results were analyzed statistically using paired t Tests.

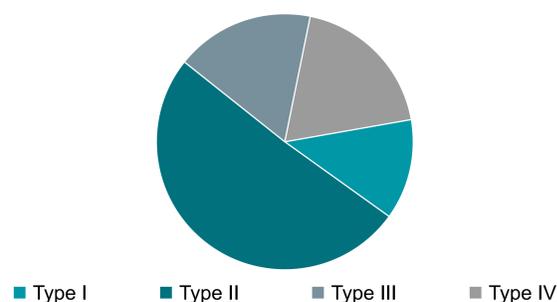


Arthroscopic image of medial condyle of knee showing chondral lesion

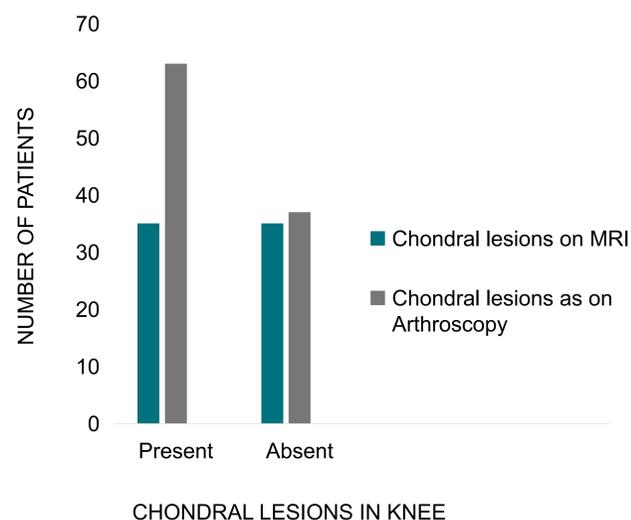
## RESULTS

- Chondral lesions were found in 63 patients during the arthroscopic procedure.
- Most of them were single lesions (65%) located on the medial femoral condyle (41.2%) or medial patellae (31.7.%); 68.25% of the lesions were classified as ICRS type 2 or 3, with an average surface of 2.4 cm<sup>2</sup>.
- MRI sensitivity was 55.55% with a specificity of 94.59%. The sensitivity increased with deeper lesions (direct relation with the ICRS classification).
- Our results showed a statistical power of 100% for Grade 4 ICRS lesions.

Type of chondral lesions according to ICRS classification



NUMBER OF KNEE CHONDRAL DEFECTS DIAGNOSED BY MRI AND ARTHROSCOPY



## DISCUSSION

- The hypothesis of this study was that 1.0-T MRI could replace diagnostic arthroscopy in the diagnosis of fresh traumatic chondral lesions.
- This study failed to support this hypothesis because of the poor sensitivity obtained with MRI.
- Studies have shown that the sensitivity, specificity and accuracy of the MRI in detecting chondral lesions are dependent on the type of MRI machine, the magnetic sequences used, size and thickness of the lesion and the experience of the radiologist .
- Higher field strength (3-Tesla) increase MRI accuracy in detecting articular cartilage lesions.
- MRI field strength affects the homogeneity of fat suppression. Fat is more homogenous and better suppressed by higher field strength. Without fat suppression sequences, interpretation of cartilage is more difficult and less sensitive .
- Most studies have shown that the MRI is more sensitive and accurate in detecting grade III and grade IV lesions.

## CONCLUSION

Although unenhanced MRI using a 3.0-Tesla magnet with conventional sequences (proton density-weighted, T1-weighted, and T2-weighted) is most accurate at revealing deeper lesions and defects at the patellae, our study shows that a considerable number of lesions will remain undetected until arthroscopy, which remains the gold standard.

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