

Introduction

The femoroacetabular impingement (FAI) is considered by many as one of the important hip diseases recently, although previously desiccated and didn't receive enough attention. FAI syndrome is a motion-related clinical disorder of the hip with a triad of symptoms, clinical signs and imaging findings. It represents symptomatic premature contact between the proximal femur and the acetabulum. FAI syndrome has three different anatomical types. Cam-type FAI, pincer-type FAI and mixed-type FAI is caused by coexisting cam-type FAI and pincer-type FAI. The tool of choice for studying FAI syndrome is MRI .Some cartilage anomalies may be too challenging for standard MRI spatial resolution and due to the labrum's oblique orientation, it might be challenging to identify some minor or nondisplaced tears on MRI so dynamic examination of the articular cartilage and labral lesion during arthroscopy with magnification and high resolution enables the surgeon to detect the location and extent of the chondral and labral lesions and to detect occult lesions easily missed by magnetic resonance imaging.

Aim of the Work

The aim of our study was to compare magnetic resonance imaging findings and arthroscopic findings in Femoroacetabular Impingement.

Patients and Methods

This study included 60 patients under went MRI with subsequent hip arthroscopy at institution with average time from MRI till arthroscopy ranged between one month and 3 months and were retrospectively evaluated. The mean age was 32.18 ± 7.16 ranging from 18 to 46 years. There were 34 males (56.7%) and 27 females (43.3%).MRI was performed for all patients “suspected to have FAI” with Siemens Magnetom Sempra 1.5T scanner. Unilateral high resolution sequence protocol using 8 channel phased array flex body coil. small field of view (FOV) was used with 320 image matrix. Protocol consists of Axial PD-FS, Coronal PD-FS,

oblique coronal PD, Coronal oblique MEDIC (Multi-Echo Data Image Combination) 3D gradient sequence, Sagittal PD & Axial oblique PD sequences. To avoid inter observer bias in analysis MRI was recorded by single radiology consultant and all cases were operated by single surgeon the first author. The surgeon knew the MR image data and the diagnosis before the operations and applied the conventional hip arthroscopy approach and inspection procedures using The Non-Arthroplasty Hip Registry form (NAHRF) to achieve an effective correlation between arthroscopic findings and magnetic resonance imaging findings and divide the acetabular zone into 6 zones : anterior-inferior zone (zone 1), anterior-superior zone (zone 2), central-superior zone (zone 3),posterior-superior zone (zone 4), posterior-inferior zone (zone 5) and acetabular notch (zone 6) for the right and left hip. The sensitivity, specificity, positive predictive value and negative predictive value of MR for diagnosing the acetabular chondral labral tears were calculated using McNemar and Marginal Homogeneity Test, using the results of hip arthroscopy as the gold standard.

Results

Forty-nine patients (81.7%) of cases had cam deformity, four patients (6.7%) had pincer deformity and seven patients (11.7) had mixed deformity. Chondral lesions were identified in 19 of 60 patients on MRI and were identified in 30 of 60 patients on arthroscopy .As shown in table (1) MRI had a sensitivity of 53.33%, a positive predictive value of 84.21 %, a specificity of 90%, a negative predictive value of 65.85%, and an accuracy of 71.67% for the detection of chondral lesions.

Table 1: Comparison between MRI and Arthroscopic findings (chondropathy)

Chondropathy	Arthroscopic				Sensitivity	Specificity	PPV	NPV	Accuracy
	No (n = 30)		Yes (n = 30)						
	No.	%	No.	%					
MRI									
No	27	90.0	14	46.7	53.33	90.0	84.21	65.85	71.67
Yes	3	10.0	16	53.3					

McN: McNemar test
p: p value for comparing between MRI and Arthroscopic
*: Statistically significant at $p \leq 0.05$

Labral tears were identified in 48 of 60 patients on MRI and were identified in 54 of 60 patients (90%) on arthroscopy. As shown in table (2) MRI had a sensitivity of 81.4%, a positive predictive value of 91.67 %, a specificity of 33.33%, a negative predictive value of 16.67%, and an accuracy of 76.67% for the detection of labral tears.

Table 2: Comparison between MRI and Arthroscopic findings (labral tear)

Labral tear	Arthroscopic				Sensitivity	Specificity	PPV	NPV	Accuracy
	No (n = 6)		Yes (n = 54)						
	No.	%	No.	%					
MRI									
No	2	33.3	10	18.5	81.48	33.3 3	91.6 7	16.6 7	76.6 7
Yes	4	66.7	44	81.5					

McN: McNemar test
p: p value for comparing between MRI and Arthroscopic

Conclusion

- MRI cannot be used to rule out a labral tear and chondral lesions when there is a high clinical suspicion and the need for therapeutic test in equivocal cases.
- FAI syndrome is a primary chondral disease with or without labral lesion so functional cartilage imaging can be considered in early detection of the disease.
- Arthroscopy remains the most accurate means of evaluating hip joint chondral and labral lesions.