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Role of MRI in the Evaluation of Endometrial Carcinoma

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Abstract: ***This prospective cross - sectional study was conducted on 61 women aged 57–80 years at Sri Siddhartha Medical College to evaluate the role of MRI in the preoperative assessment of endometrial carcinoma. MRI findings were correlated with histopathological examination, focusing on myometrial invasion, cervical extension, and endometrial thickening. MRI showed high diagnostic performance with a sensitivity of 94.2%, specificity of 70%, and accuracy of 91.14%. Positive and negative predictive values were 95.59% and 63.64%, respectively. Common MRI features included high DWI signal (77%), low contrast enhancement (75.4%), and isointensity on T2 - weighted images (60.7%). Myometrial invasion was detected in 24.6% on MRI and 31.1% on histopathology, while cervical extension was seen in 54.1%. Adenocarcinoma was the most frequent histology (88.5%), with 65.6% being well - differentiated. These findings affirm MRI as a highly effective modality for staging and evaluating local invasion in endometrial carcinoma, though improvements in specificity are warranted.***

Keywords: MRI staging, endometrial carcinoma, myometrial invasion, cervical extension, histopathology correlation

1. Introduction

Endometrial carcinoma is the most common uterine malignancy in postmenopausal women. Early detection and accurate staging are crucial. MRI provides superior soft tissue contrast for evaluating the depth of myometrial invasion, cervical spread, and lymph node status.

2. Objectives

To describe MRI characteristics in endometrial carcinoma - To assess the role of DWI and ADC mapping - To correlate imaging findings with histopathology

3. Materials and Methods

A cross - sectional study of 61 women aged 57–80 years presenting with postmenopausal bleeding or abnormal vaginal discharge. MRI was performed on a 1.5T Siemens scanner. Parameters assessed included endometrial thickness, myometrial invasion, cervical spread, and ADC values. Statistical analysis was conducted using SPSS v22.

Inclusion Criteria:
Postmenopausal bleeding - Endometrial thickness >5mm on ultrasound - HPE - confirmed or suspected endometrial carcinoma

Exclusion Criteria:
MRI contraindications - Renal dysfunction - Hemodynamic instability

4. Results

Mean age: 67.46 years (range: 57–80) - Most common symptoms: abnormal vaginal discharge (100%), bleeding (57.4%) - Myometrial invasion by MRI: 24.6% vs 31.1% on HPE - Cervical involvement: 54.1% - Diagnostic metrics: Sensitivity 94.2%, Specificity 70%, Accuracy 91.14% - MRI most commonly showed hyperintensity on DWI (77%) and low contrast enhancement (75.4%)

Figures and Tables

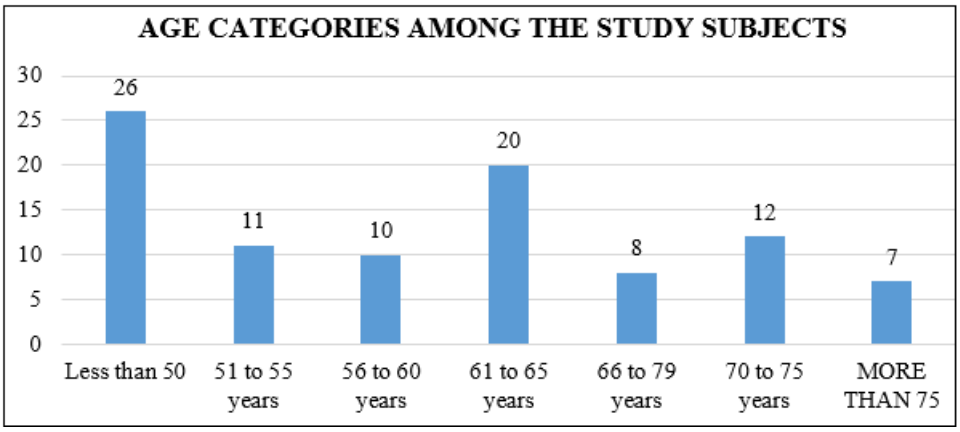

Figure 1: Age Distribution of Patients with Endometrial Carcinoma

Table 1: Diagnostic Accuracy of MRI in Endometrial Carcinoma

Metric	Value (%)
Sensitivity	94.2
Specificity	70
Accuracy	91.14
PPV	95.59
NPV	63.64

Table 2: Correlation of Myometrial Invasion on MRI with Histopathology

Invasion Detected	MRI (n)	HPE (n)
Yes	15	19
No	46	42

5. Discussion

MRI has proven to be a dependable non - invasive modality for preoperative staging. It is highly sensitive in detecting myometrial and cervical invasion. While its specificity remains moderate, combining DWI and contrast - enhanced sequences improves diagnostic confidence. The study findings align with global data, supporting MRI's routine use in staging protocols.

6. Illustrative Cases

Case - 01

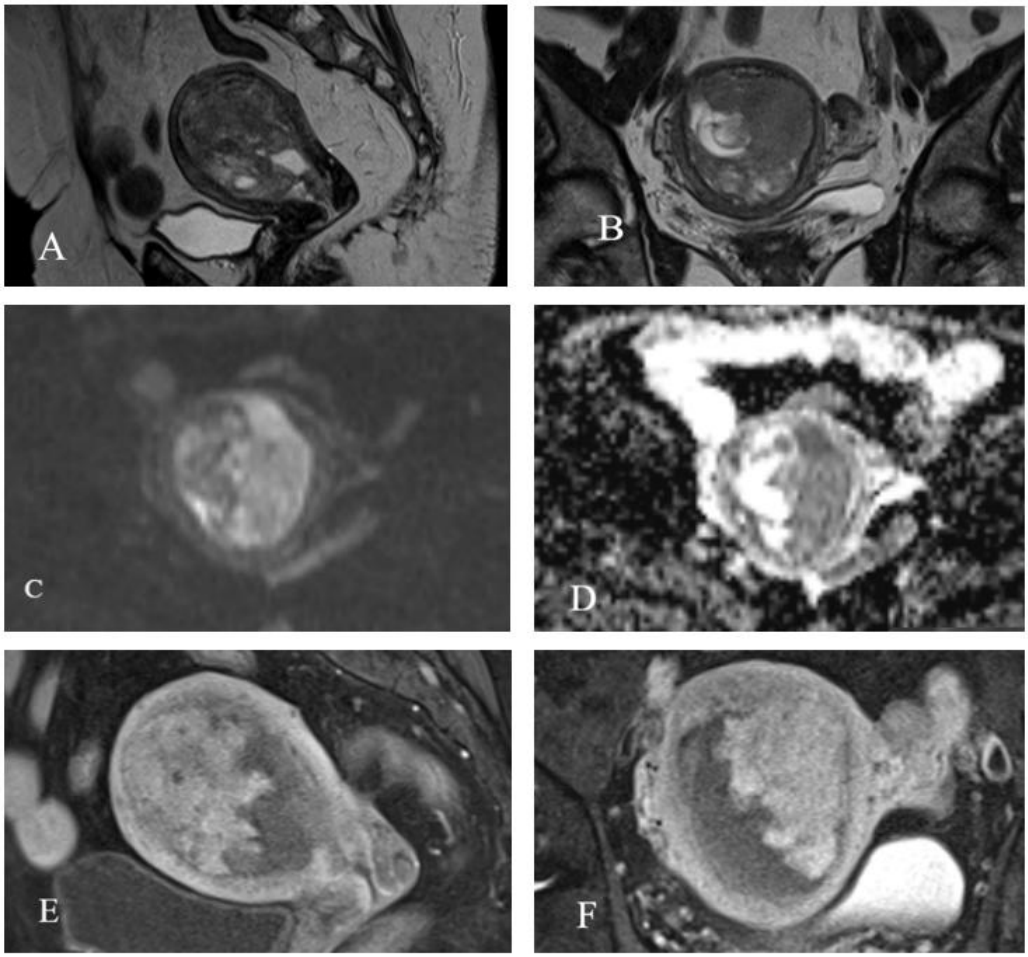

Figure 2: A 70 - year - old female with endometrial carcinoma. T2 Weighted Images (A) Sagittal and (B) Coronal sections shows endometrial thickening with heterogeneously hyperintense lesion with few cystic areas within. (C) DWI and (D) ADC

images shows diffusion restriction with hyperintense areas corresponding hypointense areas in ADC. (E) and (F) represent T1 weighted images post - contrast show significant heterogenous enhancement.

Case - 02

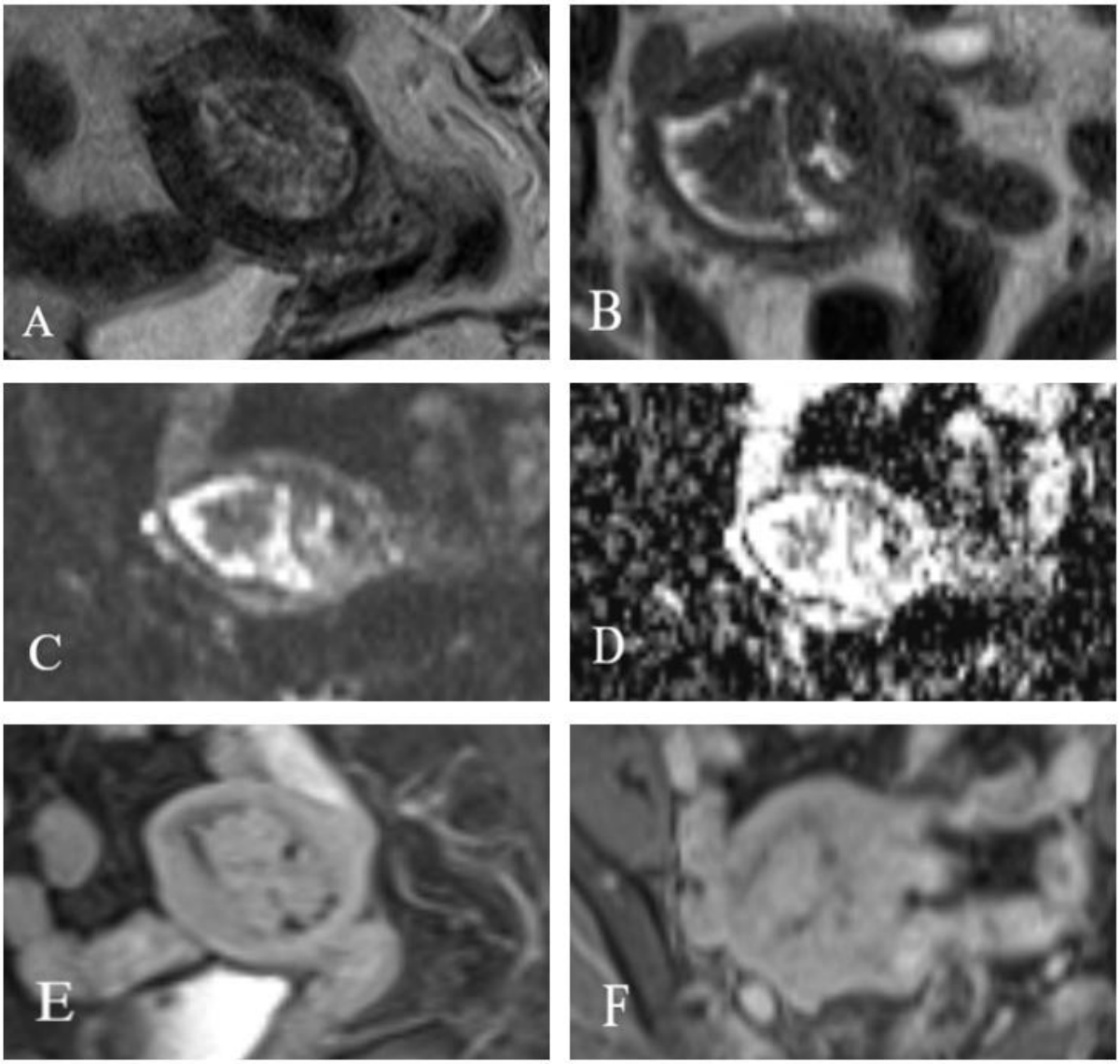

Figure 3: A 53 - year - old female with endometrial carcinoma. T2 weighted images (A) Sagittal and (B) Coronal sections shows a heterogeneously hyperintense polypoidal endometrial lesion with few papillary projection along the periphery. (C) DWI and (D) ADC shows no significant diffusion. (E) and (F) represent T1 weighted Post - Contrast images showing mild heterogenous enhancement.

7. Conclusion

MRI demonstrates high sensitivity and overall diagnostic accuracy in evaluating endometrial carcinoma. Integration with histopathology reinforces its reliability in treatment planning.

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