

Role of MRI in Evaluating Pelvic Lymphadenopathy in Patients Diagnosed with Ca Endometrium

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Abstract

Background: MRI has crucial role in diagnosing and staging cases of Ca endometrium. Detection of maximum number of positive lymph nodes preoperatively facilitate more accurate surgery with good prognosis.

Materials and Methods: This study was done in the department of Radiodiagnosis, Government Medical College, Trivandrum, Kerala. 55 patients were included in the study. Already diagnosed cases of Ca endometrium were subjected to MRI for the evaluation of extend of the disease. The data was expressed in number, percentage, mean and standard deviation. Statistical Package for Social Sciences (SPSS 16.0) version used for analysis.

Results: Out of the total 15 patients with lymph node involvement only 13 cases were detected by MRI. 2 cases were false negative. The specificity and positive predictive value for detection of lymph nodes is 100% by MRI, but the sensitivity is only 86.6%.

Conclusion: MRI is one of the valuable tools to evaluate and characterise the lymph node involvement in pelvis for patients diagnosed with endometrial carcinoma.

Keywords: Carcinoma, MRI, pelvic nodes, Endometrium, Myometrium.

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Introduction

Preoperative evaluation with accurate staging and assessment of local and distant spread of the disease is most important in deciding the surgical management in patients with Ca endometrium [1,2] The pelvic lymph node assessment preoperatively also plays a major role in radical surgical management.

Routine preoperative evaluation of cases diagnosed with ca endometrium helps in detailed assessment of the pelvic lymph nodes, hence improving the quality of life post operatively. [3-5] MR imaging plays a

crucial role in the evaluating of the cervical invasion and in assessing the involvement of lumboaortic and pelvic lymph nodes. Such clear-cut idea regarding the disease spread helps the surgical oncologist to provide the best surgical options for the patients especially the less invasive approaches.

Most common histological type of endometrial carcinoma is adenocarcinoma which contributes to around 90-95% of endometrial malignancies. In early stages endometrial carcinoma will be confined to

the endometrium. Further it spreads to the myometrium and then into the cervix. [6,7] Then there will be transversal spread, followed by spread to the parametrium, and adjacent organs like urinary bladder and bowel. Common locations of lymph node spread is to the pelvic nodes and paraaortic node. The spread through hematogenous route and intraperitoneal spread is very rare. Endometrial malignancy is one of the gynecological malignancies with good prognosis with 5-year survival of up to 84%.

In cases of gynecological malignancies like endometrial and cervical cancer, the lymph node spread denotes poor prognosis. [8-11] For example, in stages IB and IIA cervical cancer that are surgically treated, survival rate sharply reduces from 85–90% to 50–55%, respectively, in cases where metastatic lymph nodes are present. [12]. Presence of pelvic lymph nodes also helps to decide on the adjuvant radiotherapy.

Materials and methods

Study design: Observational prospective study.

Study setting: Department of Radiodiagnosis, Medical College Hospital, Thiruvananthapuram, Kerala.

Study population: All the patients who are referred for preoperative MR imaging evaluation to our department with a diagnosis of endometrial carcinoma on histopathological examination after fractional curettage.

Inclusion criteria

- Patients with a histopathological diagnosis of endometrial adenocarcinoma after fractional curettage
- they should be candidates for surgery.

Exclusion criteria

- Surgery not done due to high risk or patient refused surgery.

- Those lost to follow up.
- Inconclusive HPR reports.
- Surgery was done in another hospital.
- HPR reports suggestive of malignancies other than adenocarcinoma like leiomyosarcoma etc.
- Radiotherapy given prior to surgery for down staging the tumour.
- Patients not giving consent.

Procedure

Number of patients included for the study is 55. Initially the study procedure is well explained in detail to each patient. Informed consent was obtained from each patient. Details of each patient was recorded. The patients were instructed come for scanning after 4–6 hours of fasting so that the bowel movements are reduced and hence limits artifacts. Patient is also asked to empty the bladder just before the study. If the bladder is full it may give a suboptimal T2-weighted images due to ghosting and motion artifacts.

Imaging is done in the 1.5 tesla MRI scanner in our department. Dynamic MR imaging is done 0.1 mmol gadolinium per kilogram of body weight was administered, Imaging was performed in four phases (precontrast, arterial, venous, and equilibrium) after the injection of the contrast material. Imaging of abdomen is done up to the level of renal hila to evaluate the lumboaortic lymph nodes. Axial T2- weighted images with body coil is used for assessing the lymph node status. The cut off value for pelvic and lumbo-aortic lymph nodes is 10mm in short axis. The MRI results were recorded and analyzed.

Statistical Analysis

The data was expressed in number, percentage, mean and standard deviation. Statistical Package for Social Sciences (SPSS 16.0) version used for analysis. Chi-square test applied to find the significant difference. Micro soft excel sheet 2009 used for making the graphs.

Results

Following the MRI examination, radical hysterectomy and salpingo-oophorectomy was done in all these patients within 1 month. Lymph node exploration was done in 31 out of 51 patients. Criteria for doing a lymph node exploration include grade 3 tumour by biopsy or fractional curettage, deep myometrial invasion and cervical invasion. So comparison between post op findings and MRI findings were done only in these 31 patients. Out of these 31 patients 13 patients had pelvic lymph node involvement in MRI and 15 had pelvic node involvement in HPR. Out of the 13 patients who had pelvic lymphadenopathy no patient had stage 1A d/s. 8 patients had >50% myometrial invasion, one patient had both >50%

myometrial invasion and cervical invasion, 2 patients had <50% myometrial invasion, 2 patients had <50% myometrial invasion and cervical invasion (Table-1). Pelvic lymphadenopathy was most commonly seen with deep myometrial invasion. No patient with stage 1A d/s had pelvic lymphadenopathy. Out of the total 15 patients with lymph node involvement only 13 cases were detected by MRI. 2 cases were false negative. The specificity and positive predictive value for detection of lymph nodes is 100% by MRI, but the sensitivity is only 86.6% (Table-2). Out of the 15 patients with pelvic lymphadenopathy 13 patients were correctly diagnosed as stage 3C d/s itself. But in 2 cases pelvic lymph nodes could not be detected by MRI (Table-3).

Table 1: Frequency distribution for pelvic lymph node involvement in MRI

| Pelvic lymph node | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| No | 18 | 58.06 |
| Yes | 13 | 41.9 |
| Total | 31 | 100.0 |

Table 2: frequency distribution of pelvic lymph node in HPR

| Pelvic lymph node involvement in HPR | Frequency | Percent |
|--------------------------------------|-----------|--------------|
| No | 16 | 51.6 |
| Yes | 15 | 48.4 |
| Total | 31 | 100.0 |

Table 3: Extend of tumour spread Vs percentage of pelvic lymphadenopathy

| Extend tumour involvement | No. of patients with pelvic adenopathy |
|--------------------------------|--|
| Tumour confined to endometrium | Nil |
| <50% myometrial involvement | 4 |
| >50% myometrial involvement | 9 |
| Cervical invasion | 3 |

Table 4: Distribution of pelvic lymph node involvement in MRI and HPR

| Chi square analysis | | Pelvic lymph node involvement in HPR | | Total |
|---------------------|-----|--------------------------------------|-----------|-----------|
| | | Yes | No | |
| Pelvic lymph node | Yes | 13 | 0 | 13 |
| | No | 2 | 16 | 18 |
| Total | | 15 | 16 | 31 |

Discussion

Out of the total 15 patients with lymph node involvement only 13 cases were detected by MRI. 2 cases were false negative. The specificity and positive predictive value for detection of lymph nodes is 100% by MRI, but the sensitivity is only 86.6%. Pelvic lymphadenopathy was most commonly seen with deep myometrial invasion.

No patient with stage 1A d/s had pelvic lymphadenopathy. In the study by Riccardo Manfredi et al published in radiology MR imaging evaluation lymph node status resulted in one of 21 patients was true positive accounting to 5%, 18 of 21 patients was true-negative which 85%. But 1 of 21 patients was false-positive. 1 of 21 patients was false-negative. In that study MRI is found to be 86.7% specific and 100% sensitive for pelvic lymph node evaluation. [13-15]

High quality CT images will also provide information of the pelvic lymph nodes. However post-contrast dynamic imaging and diffusion weighted imaging play a key role in detecting involved pelvic lymph nodes. The features favouring metastatic lymph node is heterogenous internal architecture, necrosis, signal intensity similar to primary tumour and spiculation.

Diffusion restriction in DWI images is helpful in identifying early extension of the lesion to parametrium and omentum. Preoperative images are helpful in treatment protocol including the primary surgery and adjuvant radiotherapy. [16] The most accepted size criteria to differentiate between benign and malignant nodes is short axis > 1 cm. Pelvic metastatic lymph nodes may sometimes be wrongly reported due to presence of small benign mass lesions and other small pelvic masses. Normal ovaries with follicles can also sometimes mistaken as pelvic lymph nodes Peritoneal spaces, extraperitoneal spaces, and lymphatic

channels should be carefully evaluated to avoid misinterpretations. [17] Analysis of clinical data is also important.

Conclusion

MRI has high contrast and spatial resolution and the advantage of absence of radiation exposure, hence is an optimal diagnostic tool for the assessment of the female pelvis. MR images helps in identification of the different layers of uterus. Hence depth of infiltration can be better assessed.

MRI is the only imaging modality helping in the evaluation of lymph nodes, myometrium, and cervix, reaching a high diagnostic accuracy. The information provided by MRI can define prognosis, help planning the surgical approach, and identify those patients' requiring chemotherapy or radiation therapy.

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