

Magnetic Resonance Imaging in Assessment of Recurrence of Gynecological Malignancy in Iraqi Patients

Dr. Khaleel Ibraheem Mohson

MBChB, DMRD, CABMS (RAD), Lecturer in National Cancer Research Center, Baghdad University

Abstract: Background: Pelvis MRI (magnetic resonance imaging) is a noninvasive diagnostic tool and commonly used in follow up of patients with gynecological cancer as the pelvis is most common site of local recurrence. Objectives: The main purpose of this study was to explore the diagnostic effectiveness of pelvic MRI in determining, characterization and detection of pelvic recurrence in patients with gynecological malignancy. Methods: Eighty patients with gynecological malignancy who had their treatment in oncology teaching hospital underwent follow up pelvis MRI with IV (intravenous) contrast in period between September 2015 to December 2016, the patients' age range from 36 to 78 years. Results: endometrial cancer is the leading gynecological malignancy, but thank God most patients (75%) show no pelvic recurrence on MRI with IV contrast, while most of those with recurrence show lesions in surgical bed in 8% of the cases, on another hand cervical cancer had high local pelvis recurrence of about 60% in remote cervix- bed- and 24% within regional lymphatic chains, unfortunately ovarian cancer shows pessimistic results as it shows 83% recurrence in form of pelvic mass or regional adenopathy, ascites and peritoneal and omental seeding. Conclusion: MRI is a required tool in evaluation and follow up of patients with suspicious recurrence after gynecological malignancy surgery, its value was illustrated in characterization and diagnosis of pelvis lesion(s) by depending on their appearance on T1, T2 and fat suppression T2 MRI sequences in addition to assess their enhancement pattern after IV contrast injection.

Keywords: gynecological malignancy, endometrial cancer, cervical cancer, ovarian cancer, pelvis Magnetic Resonance Imaging, Gadolinium

1. Introduction

Cancer of the female reproductive tract, including the endometrial, cervix, ovaries, and vagina, endometrial cancer is the most frequent gynecological Malignancy and accounts for 6% of all cancers in women [1].

Endometrial carcinoma is divided into a number of histologic categories based on cell type, endometrioid is the most common cell type, accounting for 75-80% of cases, and subdivided into grade 1 (well differentiated) to grade 3 (poorly differentiated). Other aggressive pathologic variants with a high risk of metastatic disease include papillary serous carcinoma (<10%), clear cell carcinoma (4%), squamous cell carcinoma (<1%), mixed (10%) and undifferentiated types [2]. Local and distant recurrences continue to be a major problem in high-risk patients after surgical treatment of the primary endometrial carcinoma [3].

Ovarian cancer is the second most common gynecologic malignancy and the most common cause of death in women with gynecologic malignancies [4]. Metastases outside of the peritoneal cavity and abdominopelvic lymph nodes are rare at presentation but are increasingly recognized during treatment [5].

Cervical cancer is a 3rd common gynecological malignancy [6].

Pelvic recurrence may involve cervix, vagina, bladder, parametria, ureter, rectum and ovaries [7, 12]. MRI is considered the most accurate imaging modality for pre and

postoperative assessment of endometrial carcinoma due to its excellent soft-tissue contrast resolution [13].

Recurrent tumor appears as a mass with high signal intensity on T2WI and intensely enhances following contrast administration. [14]

2. Patients and Methods

Our study comprised 80 patient with gynecological malignancy who were operated by total abdominal hysterectomy and bilateral oophorectomy, they were treated in oncology clinic in oncology teaching hospital and referred to MRI unit to assess and follow up their pelvis for any recurrence, the study run from September 2015 to December 2016, the patients age range from 36 to 78 years.

Pelvis MRI was done using Siemens 1.5 Tesla MRI machine, the patient was examined in supine position the coil is wrapped around the pelvis and the examination was done from iliac crest to perineum using T1, T2, T2 fat suppression sequences, the sequences obtained in axial and coronal plain, then IV contrast is injected using Gadolinium, Gadolinium was used as the intravenous-contrast in a dose of 0.1 mmol/kg of body weight, patient with renal failure are not given contrast.

The presence or absence of pelvic lesion (s), its signal intensity in different sequences and the pattern of enhancement are assessed, the presence or absence of adenopathy (depending on the use of lymph node short-axis diameter of 10 mm or greater and shape of it to identify suspicious lymph nodes) and their regions and local pelvis organs invasion are also evaluated.

3. Results

Eighty patients with different gynecological malignancy, their age was between 36-78 years, 60% of them had history of endometrial carcinoma, 30% had cervical carcinoma and only 10 % operated due to ovarian cancer, the age and malignancy type distribution are shown in table 1 and 2.

Table 1: Age Distribution

Age group	No.	%
30-39	5	6
40-49	15	19
50-59	30	37*
60-69	20	25
>70	10	13
	80	

* Majority of patients are in 6th decade.

Table 2: malignancy type

Malignancy	No.	%
Endometrial	48	60*
Cervical	24	30
Ovarian	8	10

*Majority of examined patients had endometrial cancer.

Regarding the endometrial carcinoma (table 3), 75% of follow up patients show no gross obviously detected pelvic recurrence, while 8 patients show central heterogeneous enhancing mass, adenopathy seen in 3 patients, 2 at external iliac chain and one at obturator chain, bony metastases seen in 1 case seen involving the iliac bone, sacrum and lumbar vertebrae.

Table 3: Recurrence pattern of endometrial carcinoma

Recurrence	No.	%
No recurrence	36	75%
Centrally in bed	8	16.6%
Lymph nodes	3	6%
Bone	1	2%

While the recurrence pattern seen in cervical cancer table 4 is more frequent than endometrial cancer, 60% (14) of patients show local central recurrence, with Urinary bladder invasion seen in 10 out of 14 patients with hydronephrosis seen in 6 of 10, rectal involvement seen in 1 patient, while lateral extension to pelvic side wall seen in one patient.

Lymph nodes involvement seen in 24% of cases with involvement of internal and external iliac chains, clear pelvis seen only in 16 % of the cases

Table 4: Recurrence of cervical cancer

Recurrence	No.	%
No recurrence	4	16%
Centrally in bed	14	60%
Lymph nodes	6	24%

The final gynecological malignancy is the ovarian cancer figure 1, recurrence is noted in 8 cases (80%) either in form of local mass and ascites in four of them, while another two show peritoneal seeding, one patient had pelvic adenopathy in addition to local mass and one had pubic bone metastasis

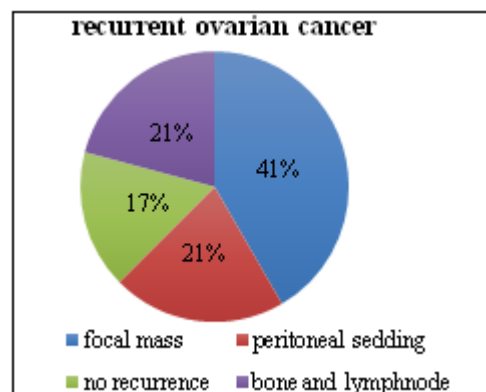


Figure 1: Recurrence of ovarian cancer

4. Discussion

A recurrence is defined as local tumor regrowth or the development of distant metastases at least 6 months after the treated lesion has regressed. Risk factors for recurrence of cervical carcinoma include the histological features of the tumor, tumor size, the depth of stromal invasion, and the nodal status at presentation (8). The most frequent site of recurrence is the pelvis (9), in our study the most pattern of recurrence is centrally in bed of old cervix and the recurrence assessed by analyzing the Images in the sagittal and axial planes are helpful in tumor detection, and the combination of T1- and T2-weighted images often allows tissue characterization and seen in form of a heterogeneous soft-tissue mass with variable degrees of necrosis at postcontrast MR imaging and this in 60 % of patient referred for follow up pelvis MRI and this in agree with study that was done by Fulcher AS et al (10), Central pelvic recurrence with anterior extension may lead to ureteral obstruction by direct encasement of the ureter or by tumor infiltration of the bladder wall, which results in obstruction at the ureteral orifice and this seen in 70% of cervical cancer recurrence in our study, while lymphadenopathy seen in 24% of MRI scan in form of scattered, minimally enlarged nodes to large, conglomerate nodal masse, the most frequent groups which are involved by recurrence include paracervical, parametrial, external and internal iliac, and obturator nodes and this is in agree with DiSaia PJ et al (7)

Regarding the recurrence pattern of endometrial cancer, 75% of the patients shows clear vaginal stump after total abdominal hysterectomy which appears as a smooth, low-signal-intensity muscular wall on T2-weighted MR images with no enhancement after contrast injection, recurrence is seen in 25% of the cases, the recurrence categorized into local pelvic recurrence that was seen in 17% as central heterogenous mass with variable contrast enhancement and this in agree with Mundt AJ et al (11), lymphadenopathy seen in 3 patients only within the external iliac chains, one patient shows extensile bone marrow lesion within the iliac bone.

Ovarian cancer shows local recurrence in 41% of follow up cases most of recurrence seen in form of adnexal mass with enhancement after intravenous contrast injection with ascites and peritoneal implant along the mesentery and omentum that seen as thickened enhancing anterior abdominal wall mass with nodular outline and abdominal ascites, lymphadenopathy seen 21% involving the internal and external iliac chains.

5. Conclusion

MRI of pelvis is an excellent imaging modality in detection and characterization of pelvic lesion(s) in patients with gynecological malignancy, when depending on location, signal characteristic of detected lesion and its appearance on variable sequences and finally we never forgot the golden role of intravenous contrast injection is as vital adjuvant to reach the final diagnosis.

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