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Management of cervical cancer detected during pregnancy: role of magnetic resonance imaging ☆

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Abstract

Objective: The aims of the present study were to assess the role of magnetic resonance imaging (MRI) in the staging and follow-up of uterine cervical cancers discovered during pregnancy and to evaluate the role of MRI in decision making regarding treatment options for patients with uterine cervical cancer during pregnancy. **Method:** Twelve pregnant women with cervical cancer were included. Two populations of patients were distinguished: localized cervical cancer discovered on the Pap smear during the first trimester of pregnancy, at an early stage (n=5), and invasive cervical cancer revealed later, during the second or third trimester (n=7). Abdominal and pelvic MRI sequences were acquired with a phased-array coil. Magnetic resonance results were correlated with the physical examination, Pap smear, and pathology. **Results:** In the first population, MRI was normal or detected a small lesion (stage IB1), and pregnancies were allowed to continue. In the second population, MRI detected a lesion in every case (mean size, 62 mm; 30–110 mm), and positive lymph nodes were depicted in 2 cases. The pregnancy was interrupted in four patients: one interruption in localized cervical cancer group and three in invasive cervical group). In all other cases, a cesarean section was done after the 30th week. In one case, MRI assessed response after chemotherapy administered during pregnancy. **Conclusion:** MRI is an essential examination for planning the treatment of cervical cancers diagnosed during pregnancy.

Keywords: Uterine cervical cancer; Pregnancy; Magnetic resonance imaging; Cancer staging

1. Introduction

Invasive cervical cancer discovered during pregnancy is a rare clinical feature. However, this is one of the most common malignancies occurring during pregnancy. The prevalence according to populations ranges between 1 and 10 for 10,000 pregnancies [1,2].

In patients without routine gynecological follow-up, pregnancy can be an opportunity to screen for cervical cancer [3,4].

Cervical cancer diagnosed during pregnancy is rather challenging, as several issues such as pregnancy outcome as well as future fertility might be compromised: when discovered during the second trimester, waiting for the delivery might be an option balanced with a possibly altered prognosis for the mother [5–8].

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MRI is a known reference examination for the management of uterine cervical cancer [9–12]. The efficiency of magnetic resonance imaging (MRI) and possible difficulties related to ongoing pregnancies have not yet been evaluated. The purpose of our study is to assess the role of MRI in this special population of patients.

2. Materials and methods

Twelve patients treated in our institution between 1999 and 2009 for a uterine cervical cancer detected during pregnancy underwent MRI. Images were reviewed retrospectively to assess the role of MRI in these patients. Two groups of patients have been identified:

- Group 1: women with a cervical cancer limited to the cervix (n=5)
- Group 2: women with a locally advanced tumor (n=7)

It was important to distinguish clearly these two populations because they differed in terms of the overall prognosis, treatment strategy, and the decision to pursue the pregnancy or not. Anyway, MRI was recommended in both groups for staging.

2.1. MRI protocol

MRI was performed before conization in all cases. MRI was performed with a 1.5-T Unit (Signa EXCITE 1.5; GEMS, Milwaukee, WI, USA). For all patients, the MRI examination included axial, sagittal, and axial views perpendicular to the cervix, using a phased-array coil. Axial and sagittal T_2-weighted fast spin echo images [repetition time, 4000 ms; echo-time, 104 ms (4000/104), axial T_1-weighted (500/10) spin echo images from the symphysis to the aortic bifurcation] were obtained with 5-mm-thick contiguous sections (field of view: 28×28 cm, 2 signals acquired, a 512×256 matrix with the pelvic phased-array coil).

The patient was imaged in the supine position.

For two patients, the sequences were acquired with a fat suppression technique for T_2-weighted images.

No gadolinium chelates nor any antiperistaltic agent was administered prior to the examination.

2.2. MRI analysis

Two radiologists with 1 and 11 years of experience in MRI, respectively (C.F., C.B.), reviewed the images. A consensus was obtained in cases of interobserver discordance.

The analysis was based on MRI performed during pregnancy.

Several points were evaluated for each examination:

- Local and regional extension (parametrium, uterus, bladder, rectum), lesion visibility, lesion size, signal intensity compared to myometrium and cervix, and pelvic and abdominal lymph node staging.
- Image impairment related to fetus movements: image quality and motion artifacts.
- Pitfalls in lesion visibility during pregnancy: lymph node visibility, lymph node detection compared to pelvic vein dilatation, and artifacts related to phased-array coil positioning.

The results of MRI were compared to the physical examination and Pap smear analysis. The treatment strategy was discussed and decided in the multidisciplinary session of the oncogynecology group.

When medical treatment was decided, magnetic resonance (MR) follow-up examination was performed every 4 weeks until the 30th week of pregnancy, to evaluate the treatment and plan a caesarian section.

3. Results

3.1. Patient characteristics

The main patient characteristics are summarized in Tables 1 and 2. The mean age was 33.5 years (SD, ±25–39 years). The mean term of pregnancy at the time of the diagnosis was the early second trimester (between 9 and 28 weeks).

Table 1
General characteristics of the patients

Patients	1	2	3	4	5	6	7	8	9	10	11	12
Age (years)	32	25	27	35	34	38	38	25	37	37	33	34
Term at diagnosis (weeks)	24	23	24	12	14	28	10	15	13	9	9	12
Stage FIGO	IIIB	IB2	IIB	IIB	IVA	IB2	IB2	IB1	IA2	IA1	IA1	IA2
Evolution of pregnancy	Early caesarian deliv [a] (chemo therapy)	Early caesarian deliv [a]	Early spontaneous vaginal deliv [a]	Med inter [b] RT [c]	Med inter [b] RT [c]	Early caesarian deliv [a]	Med inter [b]	Med inter [b]	Caesarian deliv [a]	Caesarian deliv [a]	Caesarian deliv [a]	Caesarian deliv [a]

[a] Delivery.
[b] Medical interruption.
[c] During radiotherapy.