

CASE REPORT

MRI appearances of placenta accreta pre and post chemotherapy

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Introduction

Placenta accreta defines abnormal adherence of the placenta to the uterine wall. The histology is characterized by the presence of chorionic villi directly attached to the myometrium. The exact aetiology is unclear, but is thought to involve absence of the decidua basalis and incomplete development of the fibrinoid layer. The degree of placental invasion allows the condition to be histologically classified; placenta increta implies the invasion of the myometrium by chorionic villi, and placenta percreta the penetration by chorionic villi through the myometrium and beyond the uterine serosa.¹ Placenta accreta is a rare condition with an estimated incidence ranging from 1:540 to 1:93,000.² We report a case of placenta accreta in an otherwise uncomplicated pregnancy, that was followed up by postnatal MRI. The mother underwent treatment with methotrexate, and we describe the MRI appearances before and after chemotherapy administration.

Case report

A 20-year-old woman with one previous normal vaginal delivery presented with a retained placenta in the third stage of her second delivery. She had had an uncomplicated pregnancy and had no documented obstetric risk factors normally associated with increased risk of placenta accreta. She underwent augmentation of labour for prolonged ruptured membranes at 40 weeks' gestation. The labour progressed normally, with the delivery of a male infant. Despite an active third stage of labour,

the mother had a retained placenta and was taken to theatre for manual removal. The placenta was partially removed piecemeal, but morbid adherence to the myometrium was suspected because no clear plane of separation could be determined, and the procedure was abandoned. The woman was haemodynamically stable with minimal vaginal bleeding, and thus commenced intravenous antibiotics. She was referred for MRI to assess the placenta, including degree of invasion, before consideration of the management options.

MRI was performed at 1.5T (GE Sigma LX, Milwaukee, USA) using a pelvic phased array coil for signal reception; buscopan, 20 mg IV, was administered to minimize peristaltic artefact. T2-W FSE images of the pelvis were acquired sagittally, axially and obliquely perpendicular to the uterine axis, using the following parameters: TR 6000; TE 97.3/Ef; FOV 28×28; matrix 320×256; section thickness/gap=3/1 mm. Placental tissue was clearly identified at the fundus and in the body of the uterus, extending over approximately an 8-cm length, demonstrating heterogeneous but predominantly bright signal intensity on T2W imaging. There was good demarcation of much of the placenta from the surrounding myometrium, but the myometrium at the fundus was considerably thinned and in places not separately visualized from the placenta (Fig. 1). In a normally situated placenta, there is a definite observable myometrial layer present throughout. Implantation abnormality of the placenta was diagnosed on the basis of extreme thinning of the myometrium and, in places, complete obliteration of the low signal intensity of the myometrium. The serosal surface appeared intact, and no abnormality of the surrounding soft tissue was seen. These features were consistent with placenta accreta.

Management options were discussed with the woman and her family, and it was decided that, in view of the minimal vaginal bleeding and her age

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Figure 1 T2W sagittal MRI of the uterus showing placental tissue of predominantly high signal in the fundus. The arrow points to the extreme thinning and in places absence of the low-signal myometrial layer.

and parity, conservative treatment was appropriate. She received methotrexate, 31 mg (1/2 mg/kg) IM, and folinic acid 15 mg, on alternate days for 5 days. She was carefully monitored for vaginal bleeding and sepsis, and completed a 2-week course of ciprofloxacin and metronidazole.

Following treatment, MRI was repeated. Using the same parameters, T2W FSE images were acquired sagittally and axially through the pelvis and further axial T2W FSE images through the abdomen were added. The previously noted placental mass had decreased in size to a maximum of 5 cm. There was striking alteration in signal intensity on T2W images, with the lesion now primarily of low signal intensity and only scattered areas of high signal intensity (Fig. 2). The lesion continued to produce considerable thinning of overlying myometrium, as seen on the previous study. The thinning and irregularity of the interface between mass and myometrium was considered indicative of continuing myometrial invasion, and the altered signal intensity was attributed to reduced vascularity, possibly with associated fibrosis.

The woman remained clinically well, and following counselling and a negative serum β HCG, had a 3-year contraceptive implant fitted. Further imaging was planned for 3 months later. About 10 days before the third MR study, the patient experienced acute-onset lower pelvic pain similar to labour pains and passed a fleshy mass, which was submitted for histopathology. Subsequent MRI showed



Figure 2 T2W axial MRI of the same case as Fig. 1, showing decrease in size of the placental tissue and a striking change to low signal intensity. The arrow points to the irregularity of the placental-myometrial interface, indicative of continuing myometrial invasion.

the uterus to be of normal size and internal anatomy, with no focal signal intensity changes or mass lesions (Fig. 3). Histology confirmed placental tissue with infarction and calcification.

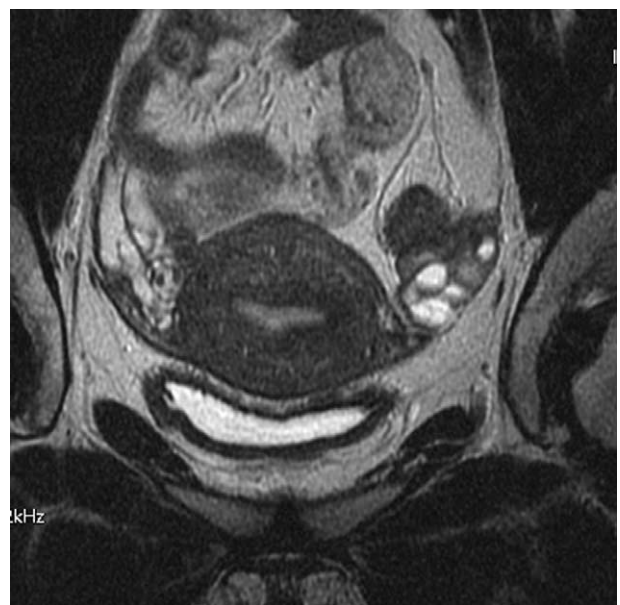


Figure 3 T2W axial MRI showing a uterus of normal size, with normal internal anatomy.

Discussion

Placenta accreta is a rare condition that can occur with placenta praevia or, as in this case, with a normally situated placenta. When the condition arises in a normally situated placenta, it is very rarely suspected antenatally. Diagnosis usually is made during manual removal of the placenta.³ Placenta praevia may predispose to the development of placenta accreta because of the inadequate decidual response of the lower uterine segment.⁴ Trophoblastic invasion may be further enhanced by previous disruption of the myometrium by uterine scarring due to either caesarean section or curettage. Clarke and colleagues found that the frequency of placenta accreta in the presence of placenta praevia increased from 24% after one caesarean section to 67% after four or more caesarean sections.⁵ Although there is much evidence to support the known risk factors for placenta accreta, in the case described no such features were identified. Gielchinsky and colleagues found that 20% of cases of placenta accrete occurred in primiparous women without any known risk factors.⁶ A possible explanation in this clinical setting is subclinical endometrial infection.

Placenta accreta and its variants result in substantial intrapartum morbidity and mortality.⁷ Prenatal diagnosis is crucial for appropriate counselling and surgical planning.⁸ Although hysterectomy is a recommended treatment, conservative management should be considered for women desiring a future pregnancy and whose vaginal bleeding is not excessive.⁴ The successful use of methotrexate in the conservative management of placenta accreta was first described by Arulkumar et al. in 1986,⁹ and subsequently by others.^{10,11} However, no standard protocols exist. Methotrexate is a folate antagonist and affects placental tissue by decreasing vascularity, which in turn leads to necrosis, as in our case. The antimetabolite specifically targets chorionic tissue, and has been used in the treatment of gestational trophoblastic malignancies. To our knowledge, this is the first report in the literature of sequential MRI before, during and after methotrexate administration.

The roles of US and MRI in diagnosis have been studied by various authors.^{12,13} MRI offers multiplanar capability and excellent soft-tissue

resolution. It depends on neither operator nor patient. Although Lam et al.¹⁴ have found MRI and US to have poor predictive value in the diagnosis of placenta accreta, most workers have found MRI to be a valuable complement to US when additional information is needed to make treatment decisions during pregnancy. In our case, antenatal US did not establish the diagnosis. This might have been due in part to the fundal location as well as the low clinical suspicion. MRI played an essential role, allowing appropriate conservative management of this case.

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