

## Uterine perforation with omentum incarceration after dilatation and evacuation/curettage: magnetic resonance imaging findings

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### Abstract

**Introduction** Cervical dilatation and/or uterine evacuation and curettage (D/E&C) is the most commonly performed and safest gynecological procedure. Although procedure-related uterine perforation is rare, this condition may require surgical intervention. Ultrasound examination and computed tomography are useful for diagnosing such perforations with incarceration of an intra-abdominal organ. However, the use of magnetic resonance imaging (MRI) for detecting postabortal uterine damage has seldom been discussed in the literature.

**Case report** A 31-year-old woman was referred to our department for lower abdominal pain and a small amount of vaginal bleeding 28 days after D/E&C for a missed abortion. Transvaginal ultrasound examination showed the presence of a hyperechogenic structure in the anterior wall of the uterine body, which was verified to be fatty tissue by MRI, particularly on the fat-suppressed T1-weighted images. An emergency laparotomy showed a uterine perforation with omentum incarceration. After dissecting the omental loop, the uterine perforation site was incised, and the involved omental tissue was debrided appropriately.

**Discussion** To our knowledge, this is the first report wherein MRI was used for the detection of incarcerated omental fat within the uterus. Delayed presentation of uterine perforation may be observed 1 month or more after D/E&C, although such a finding is extremely rare. Therefore, postabortal follow-up bimanual vaginal examination using transvaginal ultrasonography is recommended. The current study indicates the usefulness of MRI when myometrial perforation with or without incarceration of an extrauterine organ is suspected.

**Keywords** Uterine perforation · Omentum incarceration · Abortion · Magnetic resonance imaging · Delayed presentation

### Introduction

Cervical dilatation and/or uterine evacuation and, curettage (D/E&C) is the most commonly performed gynecological procedure, and procedure-related uterine perforation is rare [1]. Ileum and sigmoid colon injuries are the most common complications with the perforation [2, 3]. Some of them are asymptomatic and thus remain unrecognized, but surgical intervention is required when symptoms and bleeding or sepsis are present [4, 5]. Ultrasound examination and computed tomography (CT) are useful for diagnosis of such perforations with incarceration of the extrauterine organs [6–8]. However, the use of magnetic resonance imaging (MRI) for detecting postabortal uterine damage has seldom been described, and to our knowledge, no reports in the English medical literature have thus far described MRI findings of intrauterine omentum incarceration. Here, we present a case of incarcerated omental tissue due to uterine perforation after D/E&C detected by MRI.

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## Case report

A 31-year-old woman, gravida 4, para 3, was referred to our department for lower abdominal pain and a small amount of vaginal bleeding that lasted for 1 day. She had an obstetric history of one lower-segment cesarean section and two vaginal births after the cesarean. She had undergone D/E&C for a missed abortion at the seventh gestational week at a local clinic 28 days before the present examination. After laminaria dilatation overnight, the retained products of conception were evacuated with ring forceps and a rigid-type vacuum aspiration cannula, and then curettage was performed.

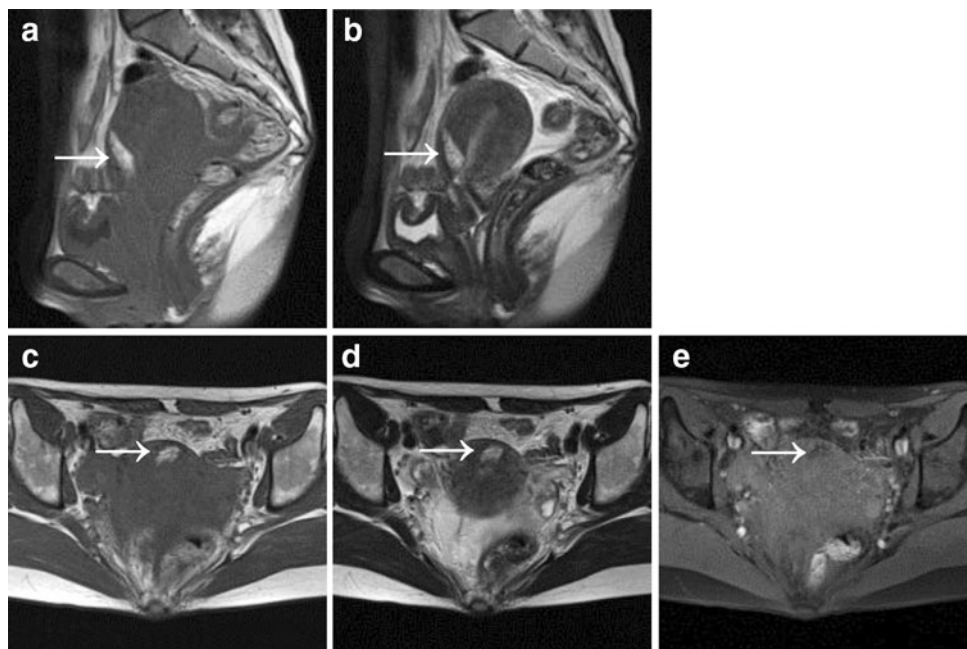
Our initial evaluation showed stable vital signs with a blood pressure of 115/64 mmHg, pulse of 76 beats/min, body temperature of 36.7°C, normal bowel sound, and mild lower abdominal tenderness without guarding or rebound



**Fig. 1** Sonographic appearance of the hyperechogenic structure in the anterior wall of the uterine body (*arrow*)

tenderness. Blood examination did not show any abnormality, with a white blood cell count of 8600/ $\mu$ l and C-reactive protein of 0.1 mg/dl, and a urinary human chorionic gonadotropin test was negative. Upright chest and abdominal radiography did not show any evidence of ileus or free air. Uterine tenderness and a thin bloody discharge were noted upon bimanual vaginal examination, and transvaginal ultrasound examination showed the presence of a hyperechogenic structure in the anterior wall of the uterine body (Fig. 1). Subsequently, sagittal and axial MRI was conducted with a 1.5T system (Siemens Japan Healthcare, Tokyo, Japan) using repetition time/echo times of 572/12 ms for the T1-weighted image, 3,600/95 ms for the T2-weighted image, and 600/12 ms for the fat-suppressed T1-weighted image. The anterior myometrial lesion appeared hyperintense on the T1- and T2-weighted images but hypointense on the fat-suppressed T1-weighted image, indicating that this intramural mass consisted of fatty tissue (Fig. 2). We suspected incarceration of the omentum or mesenteric fat caused by an evacuation-related uterine perforation and therefore performed emergency laparotomy. As expected, the omentum was incarcerated in the anterior wall of the uterine body distant from the previous cesarean scar, and neither bowel injury nor abnormal ascites was evident (Fig. 3a). After dissecting the omental loop (Fig. 3b), we incised the uterine perforation site including the serosa, myometrium, and endometrium, to debride the involved omental tissue. This incision was sutured with an absorbable thread, 3-0 PDS (Ethicon Inc., Tokyo, Japan) (Fig. 3c). The postoperative course was uneventful.

**Fig. 2** Pelvic magnetic resonance imaging: **a** sagittal T1-weighted image; **b** sagittal T2-weighted image; **c** axial T1-weighted image; **d** axial T2-weighted image; **e** axial fat-suppressed T1-weighted image. The anterior myometrial lesion was hyperintense on the T1- and T2-weighted images, but appeared hypointense on the fat-suppressed T1-weighted image (*arrow*)



**Fig. 3** Surgical findings: **a** the incarcerated omentum in the anterior uterine wall; **b** omental loop dissection; **c** uterine perforation site incision to debride the involved omental tissue, followed by suturing with an absorbable thread, 3-0 PDS



## Discussion

The reported incidence of uterine perforation after surgical abortion varies between 0.75 and 15 per 1,000 women [9]. Delayed presentation of uterine perforation at 1 month or more after D/E&C is extremely rare [4, 5], but it may occur since some perforations remain asymptomatic at the time of the procedure and thus remain unrecognized [1]. In our case, uterine perforation with omentum incarceration was diagnosed and treated 4 weeks after D/E&C. The perforation site might have been covered with the omentum, leading to delayed presentation of abdominal pain without peritonitis.

If perforation is suspected in a hemodynamically stable patient without evidence of hemorrhage, conservative treatment may be performed. However, laparoscopy or laparotomy is mandatory in cases of uteroperitoneal fistula [10], jejunouterine fistula [11], ureterouterine fistula [12], uterocutaneous fistula [13], intra-abdominal extrusion of the fetus [14], bowel injury [2, 3], intrauterine incarceration of the small bowel [6, 7], appendix [8], omentum [4] or fallopian tube [15–18], and trophoblastic tissue implantation at the uterine perforation site [19, 20], sigmoid colon [21] or omentum [22]. These complications are life threatening, but prompt recognition and appropriate surgical treatment can prevent progression to fatality. Uterine perforation with small bowel incarceration was tentatively diagnosed using sonographic examination, which is a simple and low-cost diagnostic technique that can be performed on an emergency basis [6, 7]. In addition, the use of Doppler hysterosonography for detection of uteroperitoneal fistula has been described previously [10]. Incarceration of the appendix and accompanying mesenteric fat within the myometrium were visualized using CT [8]. Intrauterine fallopian tube incarceration has been detected by ultrasound, MRI, hysteroscopy, or hysterosalpingography [15–18]. It is sometimes difficult to diagnose organ incarceration using transvaginal ultrasound alone. MRI is useful for detecting the fatty nature, which is hyperintense on T1- and T2-weighted images but hypointense on the fat-suppressed T1-weighted image. A differential diagnosis is hematoma, which appears hypointense on T1-weighted image in acute and chronic phase, hyperintense on T1- and T2-weighted

images in subacute phase, but could not be suppressed on the fat-suppressed image as opposed to fatty tissue. Our study demonstrated the utility of MRI in detecting postabortal uterine damage. MRI has a high cost and is less readily available in an emergency setting, but provides multiplanar images and superior soft tissue contrast compared to ultrasonography and CT. Although MRI assessment of postcurettage uterine appearance has seldom been described in the medical literature, a focal disruption of the junctional zone suggests perforation [23]. Physicians should be aware of unusual cases of uterine perforation, such as our case. A previous report described the case of patient who was surgically diagnosed with and treated for intrauterine fallopian tube incarceration 5 years after an abortion [15].

To our knowledge, this is the first report describing the MRI detection of incarcerated omental tissue within the uterus. Delayed presentation of uterine perforation following D/E&C may be observed, although such cases are extremely rare. Therefore, postabortal follow-up bimanual vaginal examination with transvaginal ultrasonography is recommended. When myometrial perforation with or without incarceration of extrauterine tissue is suspected, MRI is useful for detection because of its superior soft-tissue contrast. MRI should become more widely available as a choice of exploratory imaging procedures in emergency circumstances.

**Conflict of interest** The authors declare that there are no conflicting interests related to this manuscript.

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