Taiwanese Journal of Obstetrics & Gynecology 55 (2016) 910–912

Contents lists available at ScienceDirect

Taiwanese Journal of Obstetrics & Gynecology

journal homepage: www.tjog-online.com

Research Letter

Unusual imaging findings of placenta accreta resulting in early hysterectomy in first trimester—Two case reports

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ARTICLE INFO

Article history:
Accepted 8 June 2015

Dear Editor,

Placenta accreta, placenta increta, and placenta percreta are rare disorders whose incidence ranges between 1:2500 and 1:7000 [1]. Placenta accreta represents an abnormality of placental implantation in which the placental villi attach to the myometrium rather than the decidua; this leads to the formation of a morbidly adherent placenta. Placenta increta refers to the penetration of the myometrium by chorionic villi, and placenta percreta refers to chorionic villi penetrating through the myometrium and extending into the uterine serosa or adjacent organs. Placenta increta and placenta percreta are rare disorders that represent <20% of the cases of placenta accreta [2]. Placenta increta and placenta percreta are less common than placenta accreta, but compared with placenta accreta, they cause greater morbidity and even maternal and fetal mortality. Diagnosing placenta accreta in the first trimester is rare and challenging when compared with diagnosing the disorder in the second or third trimester. In the third trimester and possibly in the late second trimester, the primary ultrasonographic evidence of placenta accreta includes the obliteration of the normal anechoic space behind the placenta, the disruption of the white line from the bladder wall to the uterine interface, the presence of a local exophytic mass, and abnormal placental vascularity (including intraplacental lacunae) [3]. These symptoms may or may not be visible during the first trimester, depending on the gestational week. In this study, we present and retrospectively analyze two cases that were diagnosed prenatally as placenta accreta and confirmed pathologically to be placenta increta. Various imaging modalities were used in diagnosing the disorders.

Patient A was a 30-year-old female (gravida 7, parity 3, and artificial abortion 4) with a history of three cesarean sections. She was referred from another hospital because of vaginal bleeding during a dilatation and curettage (D&C) procedure for an artificial abortion (pregnancy 11 weeks).

Grayscale ultrasound revealed a localized heterogeneous moth-eaten-like mass in the lower uterine segment with irregular placental lacunae and absence of hyperechogenic edges (Figure 1A). A color Doppler image revealed diffuse lacunar flow and a high peak systolic velocity (PSV; 39.27 cm/s) (Figure 1B). Three-dimensional (3D) power Doppler demonstrated extreme hypervascularity and vascular detours with chaotic branching (Figure 1C). Magnetic resonance imaging (MRI) revealed multiple serpentine flow voids in the whole lower uterine segment and the upper cervix. Normal hypointense endometrium with interruption at the lower uterine segment as well as a defect in the lower anterior myometrium representing the site of the D&C procedure are shown in Figure 1D. A T1-weighted axial sequence showed multiple serpentine flow void, diffusely encircling the entire lower segment of the myometrium and parametrium (Figure 1E). Placenta increta was diagnosed, and transarterial embolization (TAE) was performed. The patient received β-hCG (beta-human chorionic gonadotropin) and ultrasonography examinations regularly at follow-up. Although her serum β-hCG levels dropped from 48,121 to 0.67 mIU/mL, and a reduction in the size and flow of the placenta increta was observed, the patient developed massive vaginal bleeding, and her blood pressure dropped to approximately 70/50 mmHg 4 months after TAE. Therefore, emergency hysterectomy was performed. During the operation, dense bladder adherence to the lower segment of uterus was found, and subtotal hysterectomy was performed. In addition, a protruding mass was observed, and frozen section examination of the tissue revealed degenerated villi (Figure 1E). The cervix was carefully separated from the bladder and removed. In addition, a defect measuring 1–2 cm in diameter with mild bulging bladder mucosa was observed and subsequently repaired. A pathology report confirmed the diagnosis of placenta increta.

Patient B was a 28-year-old female (gravida 8, parity 2, and artificial abortion 5) with a history of two cesarean sections. She

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http://dx.doi.org/10.1016/j.tjog.2015.06.019

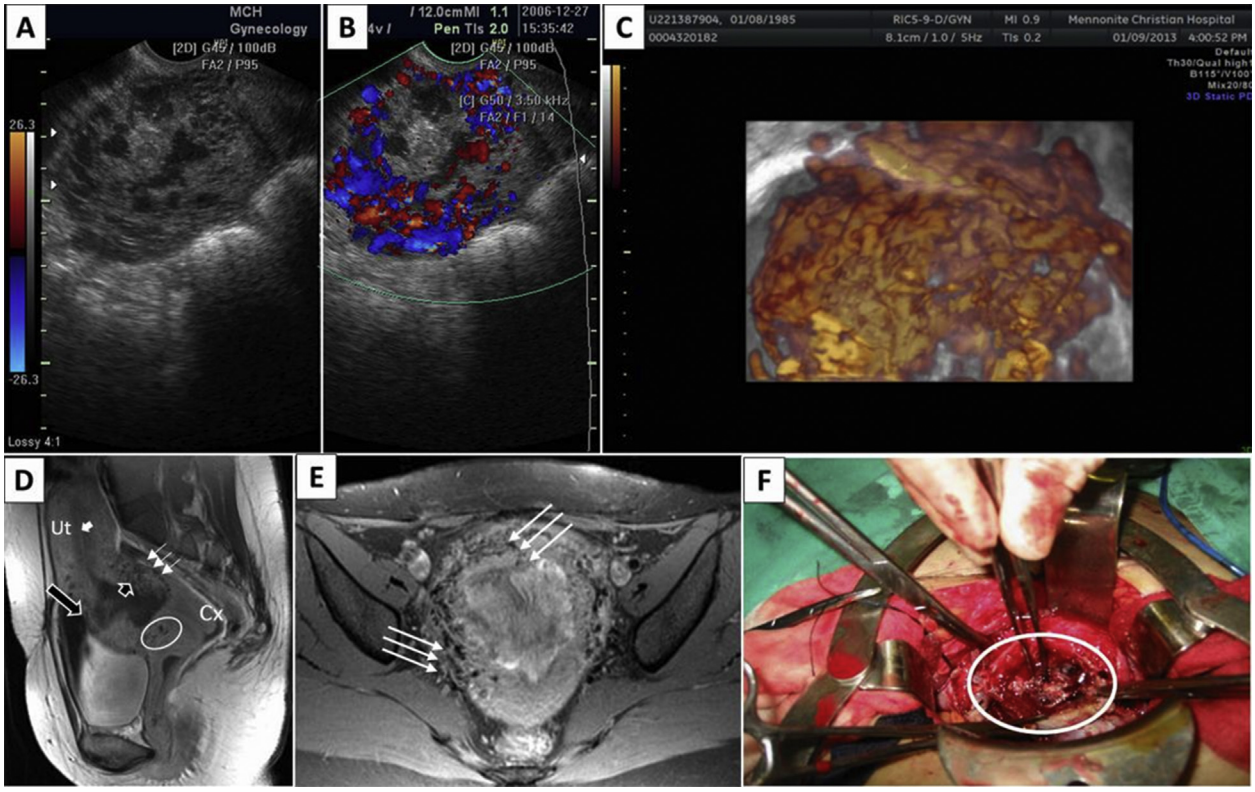

Figure 1. (A) Grayscale image shows localized heterogeneous mass in the lower uterine segment associated with irregular lacunae and absent hyperechogenic edges/interfaces. (B) Color Doppler image shows diffuse lacunar flow with high peak systolic velocity (PSV, 39.27 cm/s) and low resistance index (RI, 0.37) on spectral Doppler analysis. (C) Three-dimensional power Doppler demonstrates extensive and chaotic hypervascularity in the lower segment of uterus. (D) Postcontrasted T1-weighted sequence shows multiple vascular serpentine structures characterized by areas of flow void in the posterior and lower segment of the myometrium (white arrows). Mild uterine bulging is noted at lower segment. Normal hypointense endometrium (white arrow head) is interrupted at lower segment (short black arrow). Focal area of signal change and flow voids in the anterior lower segment and endocervix is compatible with invasive placental mass (white oval circle). Triangular area of decreased signal intensity in the lower anterior myometrium (long black arrow) represents site of prior cesarean sections. (E) Axial T1-weighted sequence shows multiple vascular serpentine structures characterized by flow void diffusely encircles the whole lower segment of myometrium and parametrium (white arrows). (F) Mass with protruding villi invades the anterior myometrium of the lower uterine segment and endocervix (white oval circle).

was pregnant for more than 9 weeks and had vaginal bleeding when she visited our clinic.

Grayscale ultrasound revealed bulging of the lower uterine segment with multiple anechogenic irregular sinuses in the entire lower segment (Figure 2A). A color Doppler image revealed copious flow in the placental–myometrial junction (Figure 2B). The subplacental space was unclear. No interruption or bulging was observed on the bladder border. The fetal heart motion was normal. MRI revealed a heterogeneous placenta, bulging of the lower uterine segment, a T2-hypointense triangular intraplacental band, and irregular dilated vascularity (Figures 2C and 2D). MRI showed no definitive invasion of the peripheral organs. All of these findings were compatible with the diagnosis of placenta accreta. One week later, a missed abortion was observed.

Laparoscopy-assisted vaginal hysterectomy was planned because the patient did not opt for uterine conservation. The uterus ruptured during the surgery, causing placental protrusion and massive bleeding (Figure 2E). A large-bite suture was applied on the right parametrium, and the uterus was quickly removed through the vagina. A 3-cm bladder tear was detected and repaired transvaginally. The patient received 4 U of packed red blood cells in blood transfusion and recovered uneventfully. A pathology report confirmed placenta accreta with foci placenta increta.

Several typical features of placenta accreta can be diagnosed using ultrasound during the first trimester. A low-lying sac may be observed, particularly in women who have previously undergone cesarean sections. This condition can be detected as early as the 5th or 6th gestational week. The low position of the sac can be related to placental attachment at a previous cesarean section scar, as previously reported by Comstock [4] and Buetow [5]. However, no such structures were observed in our patients, although they had a history of cesarean sections. Abnormal neovascularization in the ill-defined placental–myometrial junction detected in a color or power Doppler (2D or 3D) image [5] is similar to the flow observed in an invasive mole, arteriovenous malformation, or retained products of conception. This abnormal finding is another key feature associated with diagnosing placenta accreta in the first trimester. Focal or diffuse irregular lacunar lakes showed turbulent flow typified by a high velocity (PSV, >15 cm/s); in addition, a low-resistance waveform can be present [6]. The lakes lacked hyperechogenic edges but exhibited internal turbulent flow. A higher number of lakes increase the risk of a presenting placenta accreta. This focal or diffuse mass featuring multiple lacunae with a profound turbulent flow was present in our cases. Chaotic and aberrant vessels were observed in our second case [7]. Complementary MRI is frequently performed to evaluate the lateral extension and penetration depth of the placenta, because this method may provide clearer results than ultrasonography does in identifying the placenta in the first trimester when the myometrium is thick. We performed MRI in both of our cases; the results revealed multiple vascular serpentine structures characterized by flow void within the lower segment of the myometrium and the anterior cervix in the first case, and a

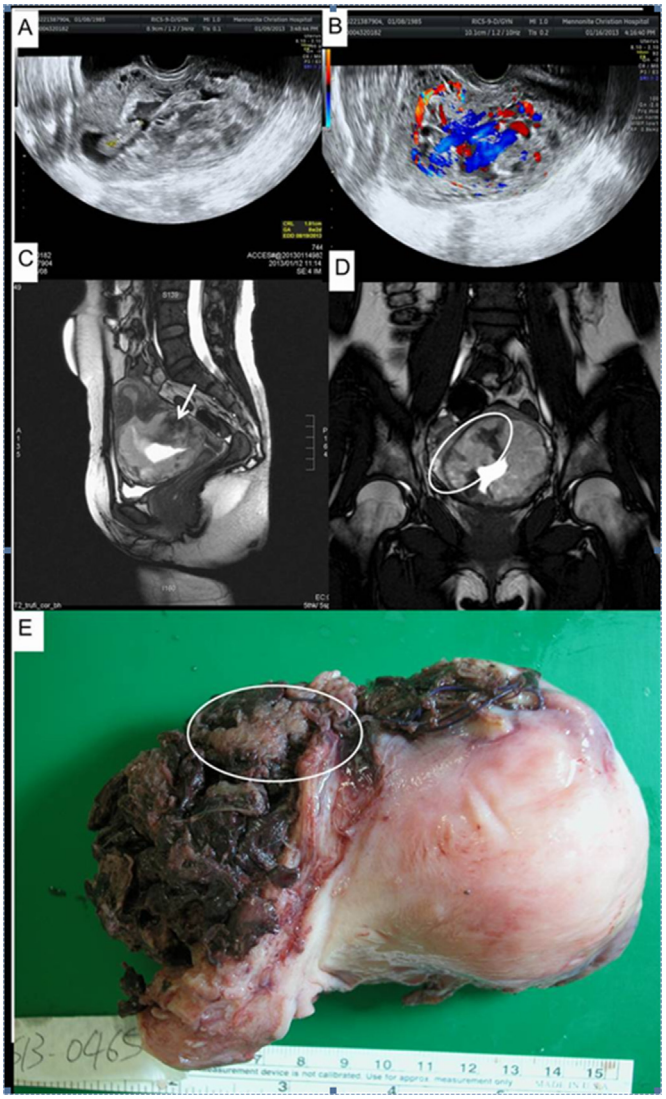

Figure 2. (A) Ultrasound grayscale image of the uterus reveals bulging of the lower uterine segment with multiple anechoic irregular sinuses. (B) Color mapping with Doppler integration depicts copious flow in the placental–myometrial junction. The subplacental space is unclear and turbulent lacunar flow is observed. (C) Sagittal T2 true FISP image shows placental-myometrium invasion that traverses and bulges the lower uterine segment. Irregular intraplacental hypointense bands are in the posterior lower uterine segment (white arrow). Discontinuity and irregularity of the posterior serosal surface is demonstrated. (D) Coronal T2 true FISP image shows heterogeneous hyperintense placenta encircling the whole lower uterine segment. Low signal intensity bands are noted on the right side. (E) Rupture of the right side of the uterine wall with bulging placenta (white oval circle). FISP = fast imaging with steady state precession.

heterogeneous invasion of the placental mass into the myometrium in the second case. Hypointense bands and an apparent bulging of the lower uterine segment were observed in the second case, whereas a mild bulging of the lower uterine segment was observed in the first case.

In addition, placenta increta may complicate pregnancy loss during the first and early second trimesters, causing profuse post-curettage hemorrhage. The etiology remains obscure, and this early-pregnancy loss occurred in our second case. Hysterectomy is a definitive treatment option for placenta accreta in such situations. However, although TAE was unsuccessful in the first case, TAE, a conservative treatment option, is reasonable if the patient opts for uterine preservation [8,9].

The frequency of placenta increta and placenta percreta is increasing, and this can be directly correlated with the increased number of cesarean deliveries and other types of uterine surgeries. However, a combination of risk factors is possible [10]. Most cases of placenta accreta develop from defects caused by prior cesarean sections. In both of our cases, the patients had multiple cesarean sections and D&C procedures. Cases involving previous cesarean sections and other uterine surgeries might help draw attention to ultrasonographic or MRI markers of placenta accreta, developing as early as the first trimester.

Early suspicion and diagnosis of placenta accreta in the first trimester can provide ample opportunity to counsel the patient about potential antepartum and intrapartum complications, thereby allowing for appropriate surveillance and offering valuable information that will help a patient in making informed decisions regarding the treatment options. Early diagnosis may not reduce the risk of hysterectomy as in our case series, but it will likely decrease surgical complications and mortality.

Conflict of interest

The authors have no conflicts of interest relevant to this article.

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