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CASE IMAGE

Contrast-Enhanced Ultrasound Diagnosis of Uterine Myometrial Ischemia Following Myometrial Repair Sutures for Postpartum Hemorrhage Caused by Placenta Accreta

Shiyu Chen[1,2] | Hong Luo[1,2]

[1]Department of Ultrasonic Medicine, West China Second University Hospital of Sichuan University, Chengdu, China | [2]Key Laboratory of Birth Defects and Related Diseases of Women and Children, Sichuan University, Ministry of Education, Chengdu, China

Correspondence: Hong Luo (luohongcd1969@163.com)

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1 | Case Presentation

A 28-year-old female patient (gravida 2, para 1) underwent a cesarean section after 33 weeks of pregnancy due to severe preeclampsia. During the procedure, the placenta was found to be deeply embedded in the myometrium and it was not expelled naturally after fetal delivery; as a result, manual extraction was required. Following the complete removal of the placenta, the right cornua and the right upper uterine myometrium were found to be extremely thin and actively bleeding. The bleeding persisted after performing bilateral ascending uterine artery ligation. Consequently, multiple figure-eight sutures were applied to repair the uterine wall and occlude the blood supply to the serosal and myometrial layers. This approach to repair effectively promoted hemostasis.

The patient progressed through puerperium without complications. Transvaginal ultrasonography performed on the 42nd postpartum day revealed a 43 × 34 mm heterogeneous hyperechoic solid mass at the previous uterine repair site. Color Doppler imaging showed prominent peripheral blood flow surrounding the mass, with no detectable blood flow within the mass itself. Contrast-enhanced ultrasound further confirmed the presence of an avascular lesion (Figure 1). Given that the location of the mass corresponded to the previous uterine repair site where the placenta had been attached and that there were no signs of vascular activity, as well as the patient's lack of significant discomfort, myometrial ischemia secondary to the uterine myometrium repair sutures was considered the most likely diagnosis. A follow-up ultrasound performed 4 months postpartum revealed a significantly reduced lesion in the right uterine horn, and 11 months after delivery, imaging indicated the complete disappearance of the mass.

2 | Discussion

Placenta accreta spectrum (PAS) is a major cause of postpartum hemorrhage, which may lead to life-threatening maternal bleeding. The most common and effective treatment for PAS with refractory hemorrhage is cesarean hysterectomy [1]. However, various surgical suturing methods at the placenta attachment site have also been successfully used as conservative treatments to preserve the uterus, including partial myometrial resection and uterine reconstruction, as well as the use of circular sutures on the serosa and myometrial layers to occlude the blood supply to the muscle layer [2, 3]. Some studies, including our case, also combine localized suturing with uterine devascularization procedures, such as the internal iliac artery or uterine artery ligation, uterine compression sutures, and balloon tamponade, to reduce blood loss during uterine repair [1, 4]. When the blood flow of the uterine artery is obstructed and the blood supply of the myometrium is compromised by localized suturing techniques, ischemia of the myometrium may develop. However, due to the abundant bilateral anastomoses between the terminal branches of the uterine arteries and the ovarian arteries, the uterus can maintain an adequate blood supply even in cases of bilateral uterine artery ligation [5]. We anticipate that the localized ischemia observed in our case could resolve as uterine recovery progresses. The gradual absorption and regression of

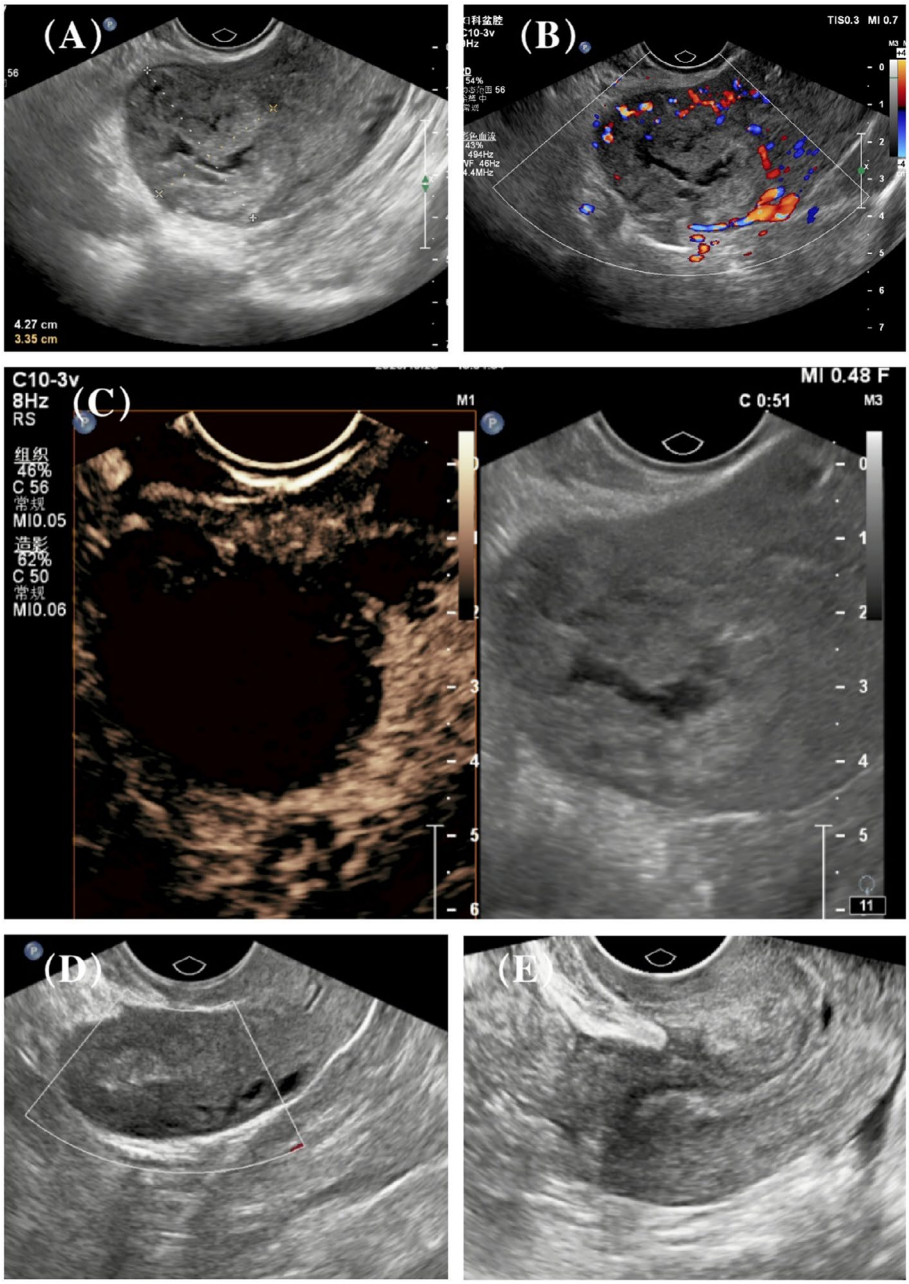

FIGURE 1 | (A) Two-dimensional transvaginal ultrasound image showing a heterogeneous hyperechoic mass at the previous uterine repair site. (B) Transvaginal color Doppler ultrasonography showing no blood flow in the inner portion of the mass. (C) Contrast-enhanced ultrasound showing an avascular lesion. (D) Transvaginal ultrasound image taken 4 months postpartum showing a significantly diminished lesion. (E) Transvaginal ultrasound image taken 11 months postpartum showing the complete regression of the mass.

the lesion during the patient's follow-up further confirmed our diagnosis.

Reported cases also exist of uterine necrosis, infections, adhesions, endometritis, and pyometra associated with compression sutures or local suturing combined with uterine artery ligation [6–8]. When considering uterine artery ligation for the management of postpartum hemorrhage, the decision should be carefully weighed, balancing the potential benefits against the associated risks of uterine ischemia. Postoperative follow-up should include assessments of uterine blood supply restoration. Currently, there are no reports detailing blood perfusion at repair suture sites. We report a case of localized myometrial ischemia after repair and suturing of the myometrium at the placental attachment site. The ultrasound characteristics of this condition included heterogeneous hyperechoic solid masses within the myometrium, with no blood perfusion observed on contrast-enhanced ultrasound.

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Ethics Statement

This study was approved by the Ethical Review Committee of the West China Second University Hospital (approval no. 2023–400).

Consent

The patient provided their written informed consent for the publication of information and images.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All the generated data are included in this article.

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