

CASE REPORT

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Pseudo aneurysm of the uterine artery with arteriovenous fistula after cesarean section: A rare but sinister cause of delayed postpartum hemorrhage

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Abstract

Pseudoaneurysm of the uterine artery is a rare complication of cesarean section. Delayed diagnosis and management may result in rapid and catastrophic postpartum hemorrhage and may necessitate hysterectomy or can even be fatal. A 28-year-old woman (gravida I, para I) presented with delayed postpartum hemorrhage 10 days after emergency cesarean section. Using transabdominal and transvaginal Color Doppler sonography, we detected a pseudoaneurysm in the posterior uterine wall, which was successfully treated with selective embolization distal and proximal to the lesion with platinum coils. In patients with delayed postpartum hemorrhage—especially after cesarean section—the rare possibility of uterine artery pseudoaneurysm must be kept in mind.

KEYWORDS

cesarean section complication, Doppler ultrasound, embolization, postpartum hemorrhage, uterine artery pseudoaneurysm

1 | CASE REPORT

A 28-year-old patient (gravida I, para I) presented with heavy delayed postpartum hemorrhage and lower abdominal pain, 10 days after emergency cesarean section for failure to progress and suspected chorioamnionitis. At the time of cesarean section, a 1200-mL blood loss due to uterine atony was successfully managed with 800 µg of misoprostol rectally, IV (intravenous) infusion of 20 IU (international units) of oxytocin, and 1 g of IV tranexamic acid. She was discharged with a hemoglobin level of 8.3 g/dL, which further dropped to 7.4 g/dL on readmission 10 days after the cesarean section.

Portable bedside transabdominal and transvaginal ultrasound examinations with color Doppler (Philips Lumify with a C5-2 convex probe and GE Voluson 730 with 5-13 MHz endocavitary probe) revealed a sharply demarcated, hypoechoic 4-cm lesion at the posterior

uterine wall entirely perfused on color Doppler US, consistent with a pseudo aneurysm (Figure 1A,B). Contrast-enhanced computed tomography (CT) confirmed a 4-cm pseudoaneurysm at a segmental branch of the left uterine artery (Figure 1C). An emergency angiography and embolization was decided with the obstetric team ready for an emergency hysterectomy in case of uncontrollable rupture during the interventional embolization procedure. Medical management at this stage included transfusion of one unit of red blood cells and 1 g of IV tranexamic acid. Antibiotic prophylaxis was given with 1.5 g cefuroxime intravenously.

The intervention was performed under general anesthesia. The right common femoral artery was accessed, and a crossover maneuver was used to enter the left internal iliac artery for selective catheterization of the left uterine artery. Angiography provided additional information about the lesion, confirming a 4-cm pseudoaneurysm and an

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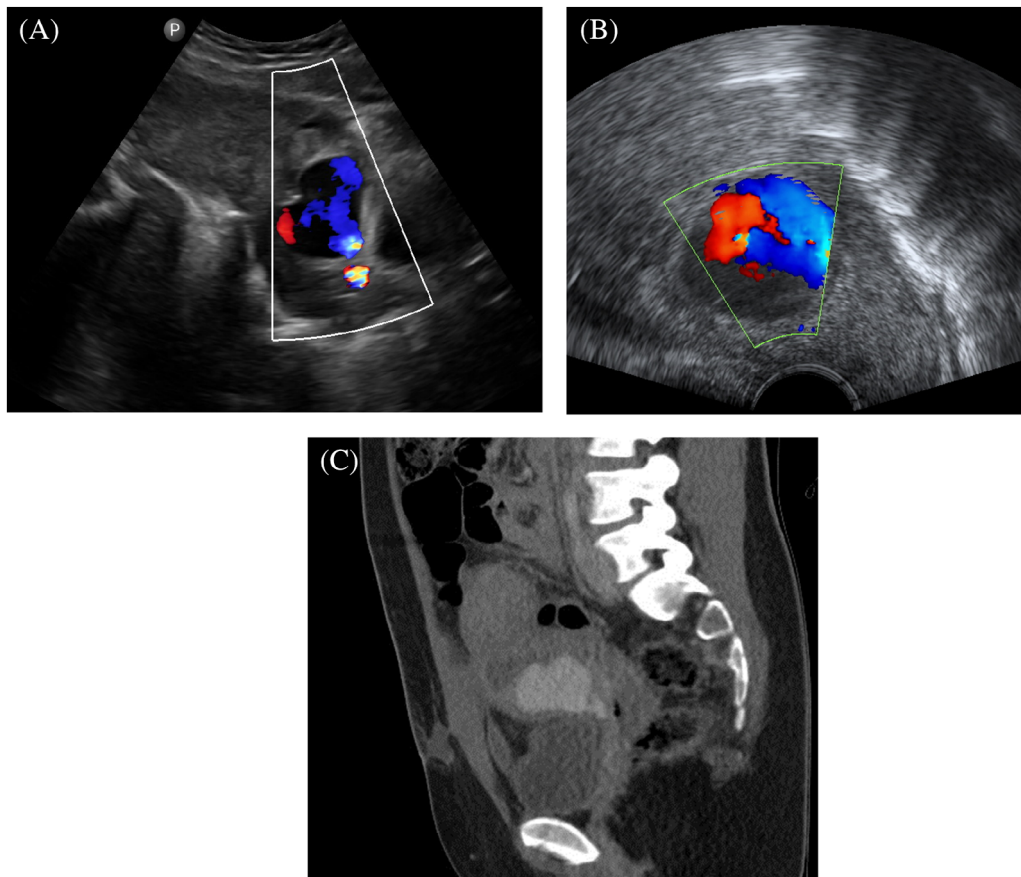


FIGURE 1 Imaging of the pseudoaneurysm. Transabdominal, A, and transvaginal, B, color Doppler sonograms showing the pseudoaneurysm with the yin-yang sign. C, Sagittal reconstructed contrast-enhanced CT scan shows the contrast-filled pseudoaneurysm of the left uterine artery

arteriovenous fistula component with rapid flow to a uterine vein (Figure 2A).

The pseudoaneurysm was coiled distally and proximally and on the side of the arteriovenous fistula using a total of 11 platinum coils. The intervention was technically successful, resulting in complete obstruction of blood flow into and from the pseudoaneurysm (Figure 2B). Transabdominal ultrasound examination (with a GE S10 scanner and a convex 2-5 MHz probe) immediately after the embolization confirmed complete collapse of the pseudoaneurysm. During a follow-up visit 4 weeks after embolization, the patient was asymptomatic, and transabdominal ultrasound revealed no reperfusion (Figure 2C). Delaying the next pregnancy for at least 12 months was recommended.

2 | DISCUSSION

Delayed postpartum hemorrhage more than 24 hours after delivery can have many underlying causes, and the differential diagnosis is challenging. Common causes include uterine atony, retained products of conception, vaginal tract trauma, and coagulation defects. Timely recognition of the rare but life-threatening uterine artery pseudoaneurysm is critical for patient management due to its high risk of

rupture. Although most patients present early after cesarean section, a high index of suspicion is warranted as cases of delayed manifestation have been reported.¹

Uterine artery pseudoaneurysm can develop secondary to traumatic injury to the artery at the time of cesarean section. The wall of a pseudoaneurysm is particularly fragile as the three layers of a true aneurysm (tunica, media, and adventitia) are absent, and rupture can lead to catastrophic bleeding. Importantly, if delayed postpartum hemorrhage is overlooked and instead misdiagnosed as retained products of conception and a therapeutic curettage is performed, this can even worsen the bleeding.^{1,2} Transabdominal and transvaginal ultrasound with color Doppler are diagnostic. Examiners should look for a “To-and-fro” waveform on duplex Doppler ultrasound.³ The “Yin-yang” sign can also be diagnostic on color Doppler examination.⁴ Angiography is both confirmatory and therapeutic. Most uterine artery pseudoaneurysms are successfully treated with gel foam and/or metallic coils.² A case report in the literature describes intra-arterial thrombin administration.⁵ Eriksson et al followed up patients after interventional treatment of uterine artery pseudoaneurysm and observed no case of infertility after embolization.⁶ Embolization may also be performed bilaterally in women with massive bleeding.⁷ In resource-limited settings, surgical uterine artery ligation is an alternative to preserve fertility.⁸ Hysterectomy may have to be considered in some patients with life-threatening hemorrhage.

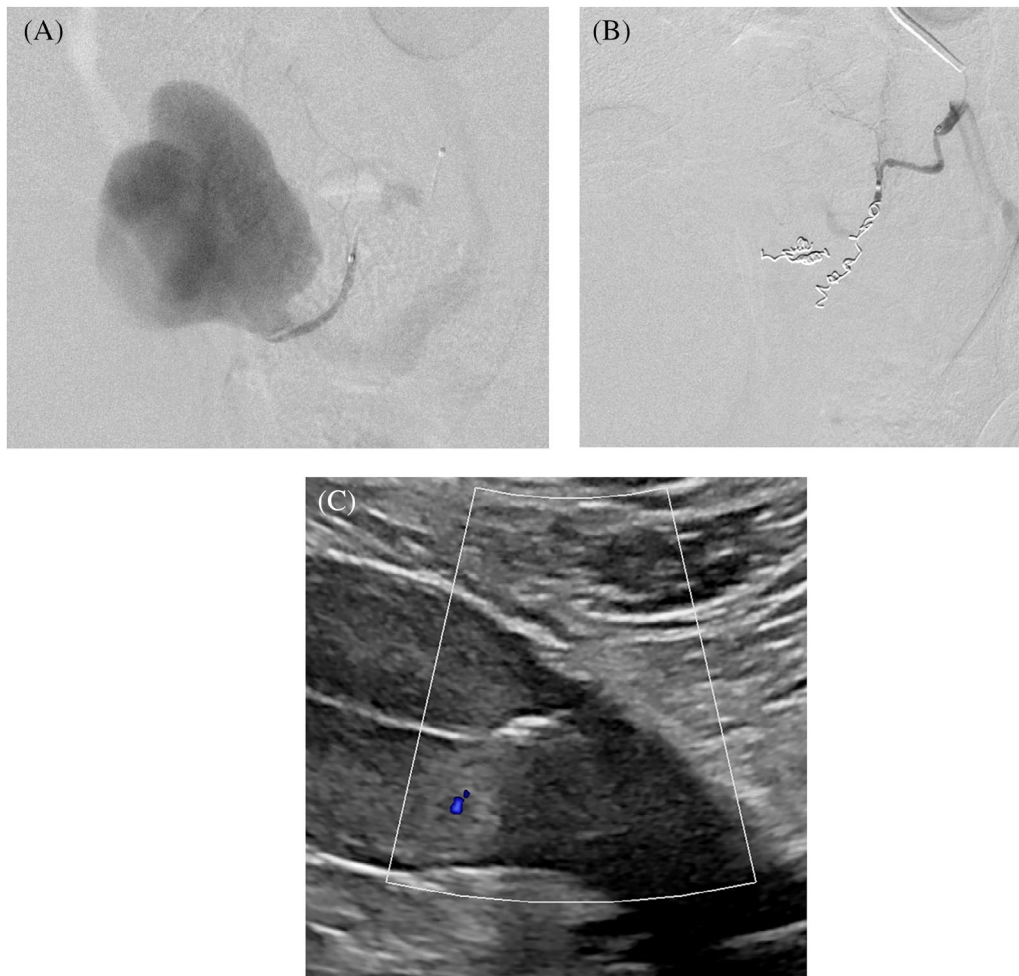


FIGURE 2 A, Angiographic visualization of uterine pseudoaneurysm with arteriovenous fistula. B, Postembolization angiogram shows the platinum coils. C, Transabdominal sonogram 4 weeks after embolization with no detectable color Doppler signal

This case report aims at raising awareness of uterine artery pseudoaneurysm as a potentially fatal underlying cause of postpartum hemorrhage. Endovascular treatment of uterine artery pseudoaneurysms is effective and should be preferred to surgery.

In patients with delayed postpartum hemorrhage—especially after cesarean section—a uterine artery pseudoaneurysm should be suspected and can be confirmed or ruled out using transabdominal and transvaginal color Doppler ultrasound. Contrast-enhanced CT or MRI may also be helpful in confirming the diagnosis and designing the treatment plan.

Embolization of uterine pseudoaneurysm is technically feasible and may prevent emergency hysterectomy in these patients. However, data on the best choice of embolization material are still limited, and further research should focus on follow-up recommendations to monitor reperfusion and plan future pregnancies.

3 | CONCLUSION

Based on published evidence and the case presented here, we recommend color-coded Doppler transabdominal and transvaginal ultrasound examination of the uterus with color Doppler is required in

women presenting with delayed postpartum hemorrhage to rule out uterine artery pseudoaneurysm. Once diagnosed, urgent angiographic management with an obstetric team on stand-by is warranted.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHOR CONTRIBUTIONS

Christian E. Althoff performed angiography. Larry Hinkson performed ultrasound and co-wrote the manuscript. Wolfgang Henrich provided valuable input for the manuscript. Julian Pohlen prepared manuscript and images and corrected the manuscript. Ulrike Wickmann performed ultrasound. All authors read and approved the final manuscript.

DATA AVAILABILITY

The datasets used during the current case report are available from the corresponding author on reasonable request.

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