



(CASE REPORT)



Pseudoaneurysm of the uterine artery, a rare cause of postpartum hemorrhage: Report of two cases and literature review

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Abstract

Pseudoaneurysm of the uterine artery is among the rare causes of postpartum secondary hemorrhage. Its diagnosis is suspected in the presence of significant uterine bleeding without any other obvious cause, and its diagnostic confirmation relies on Doppler ultrasound and angiography. We report the cases of two patients who experienced postpartum secondary hemorrhage, in whom pelvic ultrasound suspected an aneurysm, confirmed and treated by angiography. The post-embolization outcomes were favorable, marked by complete cessation of bleeding. Clinical and ultrasound follow-up at one month did not reveal recurrence of bleeding and demonstrated the disappearance of the previously described pseudoaneurysm.

Keywords: Pseudoaneurysm; Uterine artery; Postpartum Hemorrhage; Angiographic Scan; Embolization

1. Introduction

Secondary postpartum hemorrhage is defined as bleeding occurring after 24 hours following delivery and within 6 weeks postpartum. It requires prompt and adequate management, as its severity is no less than primary postpartum hemorrhage and can endanger the patient's life prognosis. Pseudoaneurysm of the uterine artery results from a breach in the wall of the uterine artery or its branches, with or without connection to the venous network. Diagnostic confirmation and treatment rely on angiography, typically resulting in a favorable outcome.

2. Observations

2.1. Observation 1

Patient aged 43, with no significant medical history, grand multipara with a history of hemorrhagic vaginal deliveries treated medically, presented with immediate postpartum hemorrhage 2 hours after a spontaneous vaginal delivery. Uterine revision did not reveal placental retention, and examination revealed sutured cervical tear. The patient responded to Syntocinon infusion and blood transfusion and was discharged. Progression marked by readmission on postpartum day 7 in a state of hemorrhagic shock following profuse bleeding. Evaluation by the on-call team found no obvious cause for the bleeding, and pelvic ultrasound showed uterine emptiness and absence of pelvic effusion. She was transfused in the intensive care unit, bleeding stopped spontaneously, and recovery was uneventful. On postpartum day 40, profuse bleeding recurred. The patient was readmitted to the emergency department; clinical examination was unremarkable, and blood tests showed hemoglobin level at 6 g/dL with normal coagulation profile. As part of investigations, pelvic ultrasound and contrast-enhanced pelvic CT were performed to search for uterine continuity disruption or signs of active bleeding, revealing a well-filled lesion on color Doppler with turbulent arterial flow

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suggestive of a vascular lesion, a pseudoaneurysm. Urgent arteriography confirmed the diagnosis of uterine artery pseudoaneurysm and enabled embolization. Post-embolization follow-up was favorable, marked by cessation of bleeding. Clinical and ultrasound follow-up at one month showed no recurrence of bleeding and disappearance of the previously described pseudoaneurysm.

2.2. Observation 2

This concerns Mrs. N.H, aged 35, G3P3, with 2 living children delivered vaginally. The current pregnancy is at term, unmonitored, and apparently progressing normally according to the patient. She was admitted to Taounate Hospital with complete dilation, presenting with a transverse presentation on vaginal examination, necessitating emergency cesarean section. The newborn is male with an Apgar score of 10/10. At 48 hours post-surgery, she experienced postpartum hemorrhage, requiring transfer to the University Hospital for further management. On clinical examination, the patient is conscious, normotensive, with slightly pale conjunctivae, and a heart rate of 110 bpm. Abdominal examination reveals a distended abdomen tender to palpation, and gynecological examination shows moderate bleeding from the endocervix. Pelvic ultrasound shows an enlarged gravid uterus consistent with the postpartum period, without effusion. Abdominopelvic CT scan reveals a pseudoaneurysm of the right uterine artery, responsible for the formation of a large intervesicouterine hematoma and moderate to large hemoperitoneum. Urgent arteriography showed a large circulating hematoma supplied by the right uterine artery. Embolization was performed with favorable outcomes, marked by cessation of bleeding and improvement in abdominal symptoms. The patient was discharged 48 hours after the intervention.

3. Discussion

Postpartum hemorrhage is the leading cause of maternal mortality worldwide, affecting up to 25% (1). Secondary hemorrhages are less frequent but of significant severity, occurring within the first 24 hours following delivery and up to 6 weeks postpartum.

The etiologies of secondary postpartum hemorrhages, in order of frequency, include retained placental fragments, endometritis, vascular abnormalities (aneurysms or arteriovenous fistulas), choriocarcinoma, and coagulopathies (2, 3). The frequency of pseudoaneurysms in the literature has not been specified, but it remains rare and exceptional (4).

3.1. Pathophysiology

Trauma to the uterine artery can result from various mechanisms: endo-uterine maneuvers (curettage, revision, and resection), surgical procedures (suturing of hysterotomy during cesarean section, myomectomy, excision of endometriotic lesions), invasion by tumoral (trophoblastic tumor) or infectious processes (5). Post-traumatic vascular injury leads to the formation of a pulsatile hematoma communicating with the artery lumen through a small neck. Blood dissects adjacent tissues and collects in the perivascular sector. Turbulence of extraluminal blood flow leads to an increase in the size of the pseudoaneurysm. Unlike "true" aneurysms, which consist of the three wall layers (intima, media, adventitia), pseudoaneurysms consist of a single fibrous layer contained by adjacent tissues and newly formed thrombus. This lesion tends to increase progressively, explaining the absence of bleeding initially. However, upon rupture, it causes active and profuse bleeding (6-7). Our patient underwent vaginal delivery followed by uterine revision and cervical suture, which are likely implicated in the trauma to the uterine pedicle. Additionally, cases of spontaneous pseudoaneurysms occurring during pregnancy, without a history of trauma, have been reported in the literature (8).

3.2. When to Consider Uterine Artery Pseudoaneurysm

Classically, the diagnosis is considered in a patient who has previously experienced postpartum hemorrhages, presumably suggesting the existence of this condition, and whose current delivery has led to the rupture of the aneurysm and significant bleeding in the absence of other classical etiologies of postpartum hemorrhage. It should also be suspected in cases of hemorrhagic delivery, in any process-causing trauma to the uterine artery, or in the presence of immediate postpartum hemorrhages without an obvious cause, as well as in cases of persistent bleeding despite subtotal hysterectomy for hemostasis or ligation of the hypogastric arteries.

3.3. Clinical Signs Suggestive of Uterine Artery Pseudoaneurysm

Clinical examination is often limited, as in our case, but it may sometimes reveal: a soft, enlarged uterus palpable on examination, with the perception on vaginal examination of a pulsatile and murmuring mass accompanied by a thrill indicative of a vascular process at this level.

3.4. Role of Ultrasound in the Diagnosis of Uterine Artery Pseudoaneurysm

The role of pelvic ultrasound in diagnostic management is primarily to rule out other causes of bleeding particularly retained placental tissue or disruption of the uterine wall. Additionally, trained teams may identify, in conjunction with color Doppler, a sac-like formation with blood flow communication with an artery through a channel called the neck. However, ultrasound should not delay the use of other diagnostic modalities, particularly CT angiography or angiography, which readily establish the diagnosis.

3.5. Role of CT Angiography and MR Angiography

CT angiography is indicated when ultrasound findings are inconclusive. It should be performed during the arterial phase. Reconstruction techniques allow for better characterization of the aneurysmal sac and its connection with the uterine artery (6-8). In our case, it revealed contrast extravasation within the uterus, thus suspecting a pseudoaneurysm.

MR angiography is not routinely performed. It is mainly indicated in cases of suspected pseudoaneurysm during pregnancy or when there is a contraindication to the use of iodinated contrast material (9).

3.6. Role of Angiography in the Diagnosis and Management of Uterine Artery Pseudoaneurysm

Angiography remains the decisive examination for establishing the diagnosis. However, it is only considered if embolization is planned, hence its dual diagnostic and therapeutic value. This technique allows for the identification of the feeding arterial axis, detection of anatomical variations, and guidance for embolization.

3.7. Management of Uterine Artery Pseudoaneurysm: Embolization

Once the diagnosis is confirmed, prompt consideration should be given, in consultation with a vascular radiologist, obstetrician, and anesthesiologist-intensivist, to embolization of the pseudoaneurysm or uterine artery. This technique should be preferred, sparing the patient immediate postoperative morbidity and preserving her ability to conceive, especially if she is young or wishes to retain her uterus.

3.8. Complications of Embolization

Rare complications following this technique have been reported in the literature, namely: transient fever or post-embolization ischemic pain, which remain minor complications and may occur after embolization for postpartum hemorrhage. More exceptionally, rupture of the pseudoaneurysm or repermeabilization of the latter, warranting a second embolization (10, 11). The outcome in our case was very favorable, with no bleeding after the completion of this technique, confirmed later by clinical examination and ultrasound, which revealed disappearance of the cervical image.

NB: The ability to conceive does not appear to be affected by uterine artery embolization.

4. Conclusion

Pseudoaneurysm is a diagnosis to consider in cases of late postpartum hemorrhage. It is suspected in the absence of other classical etiologies, and the diagnosis confirmation relies on Doppler ultrasound and CT angiography, especially due to the limited clinical signs. Embolization is currently favored over surgery due to its effectiveness, low morbidity, and especially its potential for fertility preservation.

Through our work, we aimed to raise awareness among practitioners about the importance of investigating this etiology in any patient presenting with unexplained late postpartum hemorrhage, in order to improve prognosis and ensure prompt management. Unlike our case, where the diagnosis was only made during the second episode of late postpartum hemorrhage.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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