



Case Report

Uterine Artery Pseudoaneurysm After Cesarean Section: A Rare Cause of Delayed Postpartum Hemorrhage

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Abstract

Uterine artery pseudoaneurysm represents a rare but grave complication arising from Cesarean sections, often precipitating delayed postpartum hemorrhage. Herein, we present the intricate case of a 32-year-old gravida 3 para 2 patient who, despite initial management with tranexamic acid and blood transfusions, encountered recurrent episodes of significant vaginal bleeding one week following an emergency Cesarean delivery. Subsequent investigations unveiled the presence of a uterine artery pseudoaneurysm, accentuating the diagnostic intricacies and evolving therapeutic strategies associated with this condition. While ultrasound serves as a cornerstone in diagnosis, computed tomography angiography (CTA) emerged as pivotal in delineating the pseudoaneurysm in this instance. Timely recognition and intervention, including image-guided embolization, stand imperative in averting the potentially dire consequences of uterine artery pseudoaneurysm. This narrative underscores the necessity of incorporating UAP into the differential diagnosis of delayed postpartum hemorrhage, particularly post-Cesarean sections.

Keywords: Pseudoaneurysm; Uterine Artery; Post-Partum Hemorrhage

Introduction

In this case report, we delve into the complexities of a uterine artery pseudoaneurysm, a rare complication from uterine artery injury. Unlike true aneurysms, these pseudoaneurysms have a single layer of loose connective tissue, with turbulent blood flow often resulting from surgical procedures.

We explore the medical journey of a 32-year-old patient facing postpartum hemorrhage after an emergency Cesarean delivery. Initial interventions, including tranexamic acid and transfusions, seemingly led to recovery. However, subsequent bleeding episodes

prompted a cascade of interventions, culminating in the diagnosis of a uterine artery pseudoaneurysm.

This report highlights histological features, diagnostic challenges, and evolving treatment modalities for uterine artery pseudoaneurysms. Emphasizing the critical need for early recognition, we underscore the potential life-threatening complications associated with this rare postpartum issue.

Case Presentation

A 32-year-old patient, gravida 3 para 2, presented to our Hospital complaining of brisk vaginal bleeding one week after an emergency Cesarean delivery for non-reassuring fetal heart tracing at an outside facility. Records reviewed that the patient had

an intraoperative hemorrhage and received tranexamic acid and 2 units of packed red blood cells (pRBCs). As she was bleeding from the hysterotomy, one O'Leary stitch was placed at the left angle with subsequent good hemostasis. Following an adequate postpartum progression, she was discharged three days later with a hemoglobin and hematocrit level (H/H) of 8.7/35.4.

The patient was initially admitted to our obstetrics service for symptomatic anemia and suspected retained products of conception. H/H on admission was 7.7/23.7, which improved to 8.5/26.7 after transfusion of 2 further units of pRBCs. As part of her initial management at our institution, she also received one dose of methergine 0.2 mg intramuscularly, misoprostol 800 mcg buccally, and Ampicillin-Sulbactam plus Metronidazole intravenously. The patient subjectively felt much improved and decided to leave the hospital against medical advice due to childcare commitments.

However, the patient returned to our hospital one day later due to heavy vaginal bleeding. Due to hemodynamic instability (hypotension unresponsive to fluid bolus) and heavy vaginal bleeding, the patient was emergently moved to the operating room for an exam under anesthesia and post-partum curettage due to bedside ultrasound showing a thickened endometrial stripe up to 4.2 cm. A Jada System intrauterine device was placed intraoperatively due to concern about uterine atony. The intraoperative quantitative blood loss was estimated to be 523ml. The patient also received prophylactic antibiotics (one dose of ampicillin, clindamycin and gentamicin) along with one dose of misoprostol 1000 mcg per rectum. Two more units of pRBCs were administered post-operatively, bringing the total intra- and post-partum units transfused up to six. The patient was observed in the Labor and Delivery recovery room overnight and found to be in stable condition; therefore, the Jada System was removed the subsequent day.

However, shortly thereafter, the patient had another episode of heavy vaginal bleeding. She was promptly moved back to the operating room for another exam under anesthesia and possible curettage under ultrasound guidance. Ultrasound noted lower segment/cervical clots which were removed through curettage, resulting in a quantitative blood loss of 600ml. A further 1000 mcg dose of misoprostol was administered rectally; a 24-hour oral methergine series was also initiated to promote uterine tone. The patient was then moved to radiology for a Computed Tomography (CT) angiogram of the abdomen/pelvis, which found a small pseudoaneurysm of a segmental branch of the left uterine artery (Figure 1 A, B, C). An emergency angiography was performed thereafter, confirming presence of a 9 mm pseudoaneurysm arising from the distal left uterine artery (Figure 1 D, E). IR-guided embolization of the pseudoaneurysm and left uterine artery using gelfoam (Figure 1 F) was performed without complication with

no coils used at this time given the inadequacy of the landing zone. The patient returned to Labor and Delivery for continued observation and neurovascular checks. She remained stable, received one further unit of pRBCs (bringing total to 7 units) and was discharge home with an Hgb/Hematocrit of 9.6/29.1.

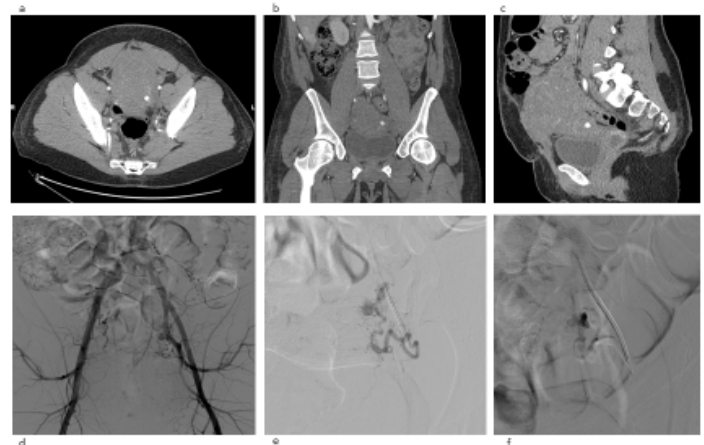


Figure 1: A. Axial computed tomography angiography shows focus of arterial enhancement/ contrast-filled pseudoaneurysm along the left uterine body B-C. Coronal and Sagittal reconstructed contrast-enhanced CT scan shows the contrast-filled pseudoaneurysm of the left uterine artery. D Pelvic angiogram and E. Selective left internal iliac angiograms show the pseudoaneurysm arising from the left uterine artery. F. IR-guided embolization of the pseudoaneurysm and left uterine artery using gelfoam.

Discussion

Postpartum hemorrhage (PPH) remains the leading cause of maternal mortality worldwide [1] Common causes of PPH include uterine atony, retained products of conception, vaginal tract trauma, and coagulation defects [1]. PPH usually occurs within 24 hours of childbirth, but it can happen up to 12 weeks postpartum, known as delayed postpartum hemorrhage [1-2]. However, differential diagnosis of delayed postpartum hemorrhages is often challenging.

A uterine artery pseudoaneurysm develops when the artery is lacerated or injured; it is a rare complication of Cesarean section [3]. Additionally, uterine artery pseudoaneurysm can be a potential complication of other surgical procedures such as myomectomy, hysterectomy, laparoscopic excision of deep endometriotic lesions, and dilation and curettage [4-9]. Histologically, uterine artery pseudoaneurysm consists of only one layer of loose connective tissue, which differentiates it from a true aneurysm consisting of a complete three-layered wall including tunica, media, and adventitia. Extraluminal turbulent blood flow can lead to enlargement of both pseudoaneurysms and true aneurysms, making them susceptible

to rupture and subsequent bleeding [10]. Therefore, early recognition of uterine artery pseudoaneurysm is critical for patient management due to its high risk of rupture. Moreover, in every case of delayed postpartum hemorrhage, a high index of suspicion regarding the formation of uterine artery pseudoaneurysm is warranted, especially because delayed diagnosis can lead to incorrect management and poor outcomes [11]. Uterine artery pseudoaneurysm can usually be diagnosed using color Doppler ultrasonography [12]. Ultrasound demonstrates turbulent arterial flow with a to-and-fro (or yin-and-yang) pattern that results from blood flow into the pseudoaneurysm; this finding has a sensitivity and specificity that can reach 95% [13-14]. However, in the case of small pseudoaneurysms, such as in the case presented above, diagnosis by ultrasound could be challenging. Moreover, color Doppler ultrasonography cannot reveal the precise vascular structure of the offending vessel from which the pseudoaneurysm has developed, which is necessary information to determine management [10]. Therefore, smaller pseudoaneurysms of <10 mm may be difficult to identify on ultrasound and may require other forms of imaging such as MRI and CTA.

MRI can confirm the diagnosis and help identify common vascular abnormalities such as arteriovenous malformations or fistulas [10]. CTA can better identify the feeding vessels of the pseudoaneurysm with minimal invasiveness and within a short period of time, and represents a powerful diagnostic tool when abnormal vascular structures are identified by color Doppler ultrasonography or when the clinical suspicion is high [10]. In the past, the majority of uterine artery pseudoaneurysms were treated by laparotomy and internal iliac artery ligation. In recent years, image-guided catheter embolization has become the preferred and most reliable method to treat uterine artery pseudoaneurysm in hemodynamically stable patients, especially in young patients seeking to preserve their fertility [11]. Most uterine artery pseudoaneurysms are successfully treated with gel foam and/or metallic coils, depending on the expertise of the surgeon and the diameter of the pseudoaneurysm [12]. Moreover, a few cases of spontaneous resolution of uterine artery pseudoaneurysms have been reported in the literature [9,10,15]. As a last resort, laparotomy with possible hysterectomy may have to be considered in unstable patients with life-threatening hemorrhage.

Conclusion

Uterine artery pseudoaneurysm is a rare complication of Cesarean section that can lead to severe, delayed postpartum hemorrhage. Ultrasound can help identify the diagnosis, but angiography is both confirmatory and therapeutic and may prevent emergency hysterectomy for some patients. In patients with delayed postpartum hemorrhage—especially after cesarean section uterine artery pseudoaneurysm should always be suspected as it is

a rare but potentially life-threatening condition.

Conflict of Interest: There is no conflict of interest

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