Uterine Artery Pseudoaneurysm Following Cesarean Delivery: A Rare Case of Secondary PPH

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Background

Postpartum hemorrhage (PPH) is a leading cause of maternal morbidity and mortality worldwide. Secondary PPH, occurring between 24 hours and 6 weeks postpartum, can arise from various causes, with uterine artery pseudoaneurysm (UAP) being a rare but potentially life-threatening etiology [1]. A pseudoaneurysm is defined as an extraluminal collection of blood with turbulent flow that communicates with the arterial lumen through a defect in the vessel wall, typically resulting from trauma or vascular injury [2]. Unlike true aneurysms, which are bounded by all three layers of the arterial wall (tunica intima, media, and adventitia), pseudoaneurysms are bounded only by the adventitia or surrounding connective tissue [3].

UAPs most commonly occur following cesarean sections but have also been reported after procedures such as dilation and curettage (D&C), laparoscopic myomectomy, and even normal vaginal deliveries [4]. The clinical presentation often includes intermittent or persistent vaginal bleeding, though some cases may be asymptomatic or present with abdominal pain or fever [5]. On Doppler ultrasound, the 'yin-yang' sign is a characteristic finding, representing bidirectional swirling of blood during systole and diastole. [6]

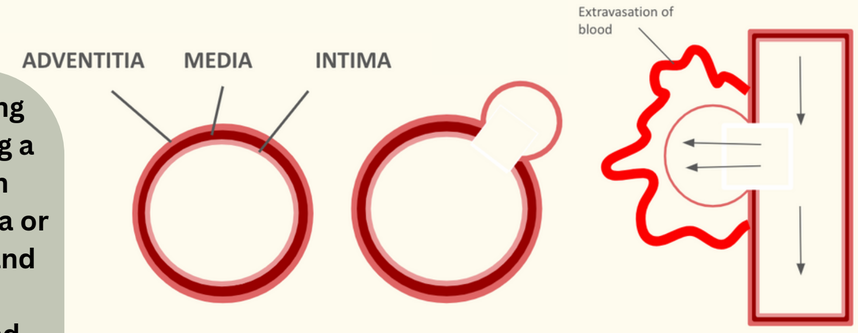

Figure 1a-c. Normal arterial wall layers (figure 1a). Pseudoaneursym bounded by adventitia only (figure 1b). Direction of flow, extraluminal collection of blood and extravasation of pseudoaneursym (figure 1c)

Case

A 26-year-old woman underwent a category 1 cesarean section at 9 cm dilatation for fetal bradycardia, with an occiput posterior (OP) deeply impacted fetal head requiring reverse breech extraction. The procedure was complicated by a left angle extension into the uterine artery, repaired intraoperatively. Estimated blood loss was 500 mL.

On postoperative day 11, she presented with sudden onset of vaginal bleeding, estimated at 1 liter. Imaging was performed to exclude retained products of conception (RPOC) and endometritis:

- Transvaginal Ultrasound (TVUS): A 45x31x33mm left peri-cervical cystic collection with pulsatile flow, suggestive of UAP.
- CT Angiography: A 33mm false aneurysm with hematoma, likely supplied by the anterior division of the left internal iliac artery.

The patient underwent interventional radiology (IR) embolization via the cervical branch of the left uterine artery, with no complications. She remained in the hospital for 2 days with no further bleeding. Repeat TV ultrasound confirmed resolution of flow within the aneurysm.

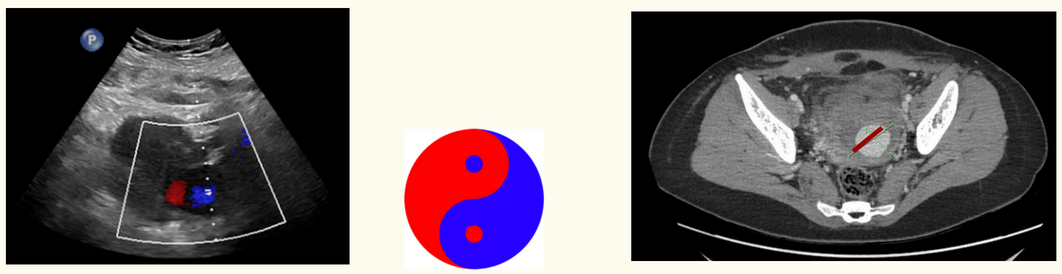

Figure 2a-c. Peri-cervical cystic collection with pulsatile flow and characteristic 'yin-yang' sign on Pelvic US. (figure 2a). Yin-yang sign (figure 2b). Red line demonstrating the false aneurysm with hematoma on CT (figure 2c)

Discussion

Uterine artery pseudoaneurysm (UAP) is a rare but serious cause of secondary postpartum hemorrhage (PPH), often associated with traumatic deliveries or surgical procedures such as cesarean sections [4]. A review of the literature reveals that cesarean section is the most common cause of UAP, accounting for approximately 47.4% of reported cases [6]. While the mean interval between the inciting event and symptom onset is approximately 2 weeks, delayed presentations have been reported up to 10 years post-cesarean delivery [4,5]. This case highlights the importance of considering UAP in patients with a history of complicated deliveries, particularly when presenting with delayed or recurrent bleeding.

Uterine artery embolization (UAE) is the preferred treatment, offering a minimally invasive approach that preserves fertility and avoids hysterectomy [5]. Early recognition and intervention are critical to prevent life-threatening complications such as rupture and massive hemorrhage.

In conclusion, UAP is a rare but potentially catastrophic cause of secondary PPH. Clinicians should maintain a high index of suspicion for UAP in patients with a history of traumatic deliveries or surgical interventions to ensure prompt diagnosis and management, thereby reducing maternal morbidity and mortality.

References

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