Uterine artery pseudoaneurysm: A rare life-threatening cause of secondary post partum haemorrhage

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Section: Interventional radiology
Area of Interest: Genital / Reproductive system female
Procedure: Embolisation
Imaging Technique: Ultrasound-Colour Doppler
Imaging Technique: Ultrasound-Spectral Doppler
Imaging Technique: CT-Angiography
Imaging Technique: Catheter arteriography
Special Focus: Aneurysms Case Type: Clinical Cases
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Patient: 26 years, female

Clinical History:
A 26-year-old female who delivered a 2800g male baby was admitted with excessive bleeding per vaginum. She underwent elective C-section 5 weeks before. O/E she was hypotensive, anaemic (Hb 3.8), abdomen was soft with healthy scar. Uterus bulky, os closed. Blood clots ~ 100g were removed from the vagina.

Imaging Findings:

Transabdominal colour Doppler US revealed a well-defined rounded cystic lesion with colour filling and aliasing, measuring 1.3 cm × 1 cm in anterior wall of lower uterine segment (Fig. 1a). Spectral Doppler showed marked turbulence and biphasic pattern (Fig. 1b).

CT angiogram showed a well-circumscribed globular contrast-filled lesion in left anterior myometrium of uterus suggestive of a pseudoaneurysm (Fig. 2a, 2b).

Transcatheter arterial embolization of pseudoaneurysm was planned and DSA was done. Left iliac arteriogram revealed a pseudoaneurysm from the terminal part of the left uterine artery (Fig. 3a, 3b). Superselection of terminal branch of left uterine artery was done using a microcatheter and was embolized with N-butyl cyanoacrylate (Fig. 4a). The right uterine artery was embolized with gel foam. Post embolization angiography showed no evidence of pseudoaneurysm (Fig. 4b). Follow-up colour Doppler US showed aneurysmal cavity filled with echogenic content with no evidence of blood flow.

Discussion:
Secondary postpartum haemorrhage is defined as excessive bleeding starting any time from 24 hours after delivery to 6 weeks postpartum. Common causes of secondary postpartum haemorrhage are retained products of conception, sub-involution of the uterus and placental bed, and endometritis [1]. Vascular causes include uterine pseudoaneurysms, arteriovenous malformations, and direct vessel rupture.

Uterine artery pseudoaneurysm is a rare life-threatening cause of secondary postpartum haemorrhage [2]. Extended
uterine incision, additional haemostatic suture and repeated caesarean sections are the risk factors associated with the occurrence of pseudoaneurysm after caesarean section [3]. Rupture of pseudoaneurysm causes severe haemorrhage.

Color Doppler US and Computed Tomography are being used more frequently as initial diagnostic modalities [4]. On US, pseudoaneurysm appears as an anechoic sac which shows turbulent arterial flow on Doppler [5, 6]. Doppler demonstrates to-and-fro sign in the neck and yin yang sign in the body of pseudoaneurysm with a narrow neck [7, 8]. Computed Tomography can confirm the diagnosis and help rule out other causes of delayed postpartum haemorrhage. Angiography remains the gold standard in confirming the diagnosis.

Treatment options include hysterectomy, surgical ligation of uterine arteries and transarterial embolisation of uterine artery (TAE). Many studies have documented the safety and effectiveness of TAE for secondary PPH and reported clinical success rates >90% [9]. Angiographic embolization of pseudoaneurysm has the advantages of low morbidity, easy localization of bleeder, more distal occlusion than surgical ligation, and preservation of fertility compared to hysterectomy.

Redistribution of blood or neovascularization may allow bleeding to occur from the contralateral side after unilateral embolisation. Hence, bilateral uterine artery embolization is safer than unilateral embolisation [10]. Embolisation of anterior divisions of both internal iliac arteries should be considered when the uterine artery could not be easily accessed or when vaginal bleeding continues in spite of embolisation of both uterine arteries [9]. The cervicovaginal branch should be spared during embolisation [11].

Take home message - In a woman with unexplained vaginal bleeding after caesarean section delivery, pseudoaneurysm is a potentially life-threatening complication and should be considered as a differential diagnosis.

Differential Diagnosis List: Left uterine artery pseudoaneurysm, Arteriovenous malformation, Direct vessel rupture

Final Diagnosis: Left uterine artery pseudoaneurysm

References:

Mou et al. (2014) Giant uterine artery pseudoaneurysm after a missed miscarriage termination in a cesarean scar pregnancy. BMC Women's Health 14:89 (PMID: 25070087)
**Figure 1**

Description: Sagittal sonogram of uterus (B&W) showing well-defined rounded cystic lesion with colour filling in anterior myometrium. **Origin:** Nita H, Department of Radiology, Dr. SMCSI Medical College, Karakonam
**Description:** Spectral Doppler showing marked turbulence in the lesion. **Origin:** Nita H, Department of Radiology, Dr. SMCSI Medical College, Karakonam
Description: CT axial section showing a well-circumscribed globular contrast filled lesion in left anterior myometrium of uterus suggestive of pseudoaneurysm. Origin: Nita H, Department of Radiology, Dr. SMCSI Medical College, Karakonam
Description: CT coronal section showing the pseudoaneurysm in left anterior myometrium of uterus.
Origin: Nita H, Department of Radiology, Dr. SMCSI Medical College, Karakonam
Figure 3

Description: Left internal iliac arteriogram showing a contrast-filled smooth outpouching suggestive of pseudoaneurysm. Origin: Manish Kumar Yadav, Department of Radiology, Kerala Institute of Medical Sciences, Trivandrum
**Description:** Selective injection of left uterine artery using a microcatheter showing the pseudoaneurysm in its terminal part. **Origin:** Manish Kumar Yadav, Department of Radiology, Kerala Institute of Medical Sciences, Trivandrum
Description: Embolisation of pseudoaneurysm using N-butyl cyanoacrylate. Origin: Manish Kumar Yadav, Department of Radiology, Kerala Institute of Medical Sciences, Trivandrum
**Description:** Post-embolisation left internal iliac arteriogram. Now the psedoaneurysm is not filling.

**Origin:** Manish Kumar Yadav, Department of Radiology, Kerala Institute of Medical Sciences, Trivandrum