Uterine Artery Pseudo-aneurysm: Review of Literature

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ABSTRACT

The common causes of secondary primary postpartum hemorrhage are usually retained products of conception and endometritis with vascular anomaly being a rarer cause. Pseudoaneurysm of the uterine artery or its branches usually develops as a complication of myomectomy, dilatation and curettage (D and C), and caesarean section. We present a case series of uterine artery pseudoaneurysms which occurred as complications of caesarean section and D and C, presenting with vaginal bleeding.

Key words: Colour Doppler; computed tomography angiography; embolization; uterine artery pseudoaneurysm

Introduction

Pseudoaneurysm of uterine arteries and its branches usually develops after invasive procedures such as caesarean section, myomectomy, and dilatation and curettage (D and C). Postpartum hemorrhage usually occurs in 24 h but can present up to 6 weeks after delivery.[1] The common causes are endometritis or retained products of conception, but other less common causes such as choriocarcinoma, uterine arterio-venous malformation, and uterine artery pseudoaneurysm should be kept in mind, as they can cause significant morbidity and mortality.[2-4]

Case Reports

Case 1

A 32-year-old G_2P_2 patient presented with severe secondary postpartum hemorrhage on the 26th postcaesarean day and was sent to Radiodiagnosis Department for ultrasonography (USG) which showed normal sized uterus with well-defined anechoic eccentric lesion within the myometrium. The lesion on Doppler showed increased blood flow with arterial blood flow pattern, to-and-fro, on spectral [Figure 1]. Computed tomography angiography (CTA) was done on multi-row detector helical CT for exact and precise localization of the aneurysm which clearly demonstrated well-defined contrast opacified lesion arising from the left uterine artery and the diagnosis and localization of pseudoaneurysm was confirmed [Figure 2a and b]. Since the facility of embolization of uterine artery is not available in our institute and as the patient was bleeding heavily, emergency bilateral uterine artery ligation was attempted which failed and eventually total abdominal hysterectomy was done after proper consultation with the patient and her husband.

Case 2

A 27-year-old G_1P_1 patient who had been delivered of a male child by caesarean section done for placenta previa presented with mild but continuous postpartum hemorrhage on the 28th day of her operation. The patient was evaluated first by B-mode USG, which revealed well-defined pulsatile anechoic lesion in the right lateral wall. The patient was sent for CTA done on multi-detector 64 slice helical CT scanner which clearly demonstrated a well-defined aneurysm arising from the right uterine artery as shown in Figure 3a and b. With no option

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available for embolization in our institute and to conserve the uterus for her future pregnancy, bilateral internal artery ligation was done which was successful in controlling her bleeding. The patient was followed up for 1 year, and she normally conceived after 7 months of the procedure with no complication seen till date.

Case 3

31-year-old female G1P0 was referred to our department for B-mode USG of pelvic organs as a case of continuous vaginal bleeding for last 15 days. She had a history of D and C done for an incomplete abortion 1-month back. USG revealed normal sized uterus with a small anechoic lesion in the right lateral wall. Doppler study was suggestive of pseudoaneurysm [Figure 4]. Subsequently, CTA was done which confirmed our diagnosis [Figure 5a and b]. CTA showed the exact size, location, and the feeding artery of pseudoaneurysm. The patient was managed by ipsilateral ligation of the right uterine artery as to preserve her reproductive functions. Postoperative period was uneventful.

Discussion

Postpartum hemorrhage remains one of the major causes of maternal mortality. It occurs in < 5% of all deliveries and accounts for about 15% of all maternal deaths.[5] Primary postpartum hemorrhage (PPH) occurs within the first 24 h of delivery. The primary causes are uterine atony (–70% of cases), retained placental fragments, endometritis, genital laceration, uterine inversion or rupture, and coagulation disorders.[6] Secondary postpartum hemorrhage is defined as excessive vaginal bleeding starting 24 h after delivery up to 6 weeks.[7] Common causes include retained products of conception, subinvolution of the placental bed, and endometritis.[8] Rare causes include pseudoaneurysm of the uterine artery, arterio-venous malformations, and choriocarcinoma. When common causes have been excluded by clinical examination and/or pelvic USG. Color Doppler study and pelvic angiography may be performed either by conventional angiography or by CTA.

Pseudoaneurysm develops due to trauma to the uterine artery or its branches during caesarean section, myomectomy, or D and C procedures.[9] The absence of a three-layered arterial wall lining in a pseudoaneurysm differentiates it from a true aneurysm. Uterine artery pseudoaneurysm may be asymptomatic but usually presents with secondary PPH or delayed vaginal bleeding after D and C or myomectomy.[10] If pseudoaneurysm is not

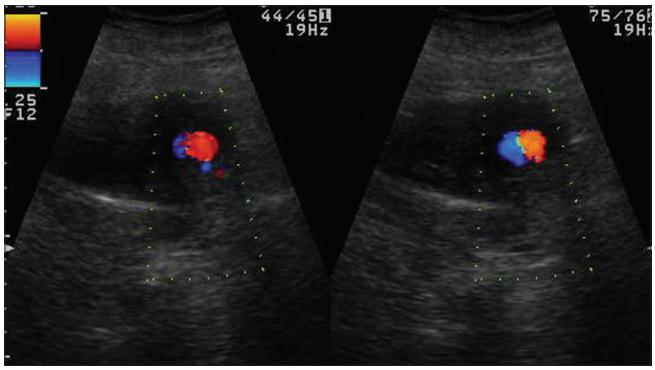

Figure 1: Color Doppler image shows well-defined pseudoaneurysm in left lateral wall of uterus with dual color

Figure 3: (a) Axial computed tomography angiography maximum intensity projection image in case 2 showing well-defined contrast enhanced pseudoaneurysm arising from the right uterine artery, (b) coronal reformatted maximum intensity projection-computed tomography angiography image of the same patient showing pseudoaneurysm

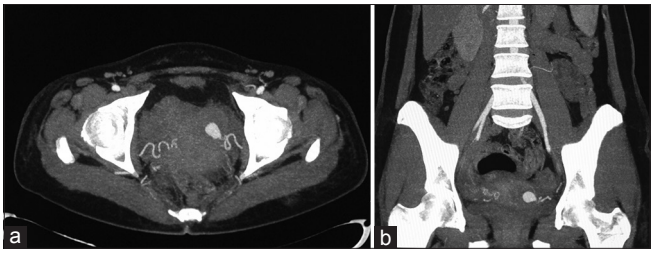

Figure 2: (a) Axial computed tomography angiography maximum intensity projection image shows well-defined oval-shaped highly contrast opacified pseudoaneurysm arising from left uterine artery, (b) reformatted coronal maximum intensity projection-computed tomography angiography image showing the pseudoaneurysm in the same patient

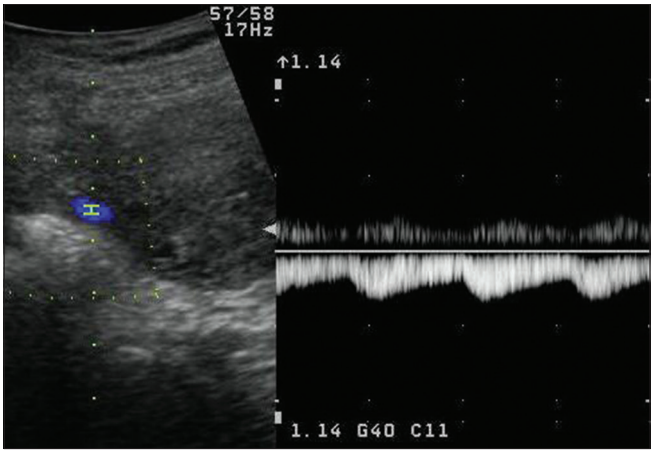

Figure 4: Spectral Doppler image in another patient showing characteristic to-and-fro flow waveform in right uterine artery pseudoaneurysm

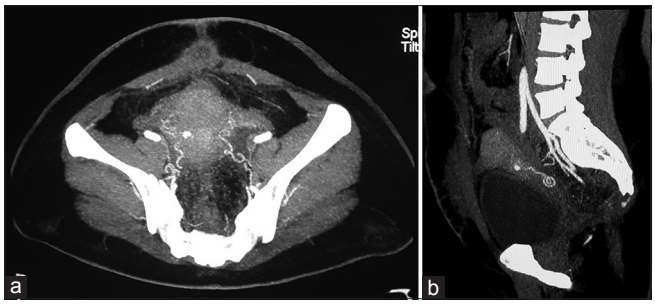

Figure 5: (a) Axial computed tomography maximum intensity projection image in case 3 showing small right uterine artery pseudoaneurysm near cervix, (b) sagittal reformatted maximum intensity projection image showing the tortuous right uterine artery along with well-opacified pseudoaneurysm

connected with the endometrial cavity, hemorrhage may be confined to the abdominal cavity, leading to abdominal pain.[11]

B-mode USG in a case of uterine artery pseudoaneurysm reveals pulsatile anechoic or hypoechoic lesion within the myometrium. Color Doppler USG shows color signals within the lesion and aliasing at the neck of pseudoaneurysm due to turbulent blood flow. Spectral Doppler reveals a characteristic to-and-fro pattern, and it has been reported to have a diagnostic sensitivity of 95%.[12,13] In our case, 3rd characteristic Doppler findings were noted. In cases where color Doppler and gray-scale findings are equivocal CTA is done to confirm the diagnosis and know the exact site, dimensions, orientation, and the status of the feeding artery. Magnetic resonance imaging and angiography (MRA) can be used to confirm the diagnosis in cases where CTA cannot be done.

Treatment of uterine artery pseudoaneurysm is done by uterine artery embolization or ligation, internal artery ligation or by emergency hysterectomy in cases of life-threatening vaginal bleeding and/or wherever family of the patient is completed. Uterine artery embolization is an emerging technique which has become an effective and safe treatment for postpartum hemorrhage, allowing the preservation of reproductive function. In a series of women, Rosenthal and Colapinto,[14] observed angiographic arterial embolization was shown to be the most useful clinical tool in the management of postoperative vaginal hemorrhage. Recently, ultrasound guided injection of thrombin directly into the pseudoaneurysm has been used as a substitute for arterial embolization; however, its indications and effectiveness have not yet been determined.[15] The surgical approach may be more suitable in cases of acute and massive bleeding in which there is no time for embolization and may depend on the specific resources available in each institution. Hysterectomy is one of the surgical options when the preservation of fertility is not important. On the other hand, uterine artery or internal artery ligation is another surgical choice for preserving fertility. Burchell demonstrated that bilateral internal iliac artery ligation was more effective in reducing the pulse pressure than unilateral ligation.[16]

To conclude uterine artery pseudoaneurysm usually presents with vaginal bleeding and is diagnosed with gray-scale and color Doppler USG, which shows characteristic features. The diagnosis can be confirmed either with pelvic angiography (CTA or MRA). A uterine artery or internal artery embolization or ligation is preferred treatment preserving fertility. However, emergency hysterectomy can be done wherever indicated.

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Conflicts of interest
There are no conflicts of interest.

References

1. Gürses C, Yilmaz S, Biyikli S, Yildiz IO, Sindel T. Uterine artery pseudoaneurysm: Unusual cause of delayed postpartum hemorrhage. J Clin Ultrasound 2008;36:189-91.
2. Yi SW, Ahn JH. Secondary postpartum hemorrhage due to a pseudoaneurysm rupture at the fundal area of the uterus: A case treated with selective uterine arterial embolization. Fertil Steril 2010;93:2048-9.
3. Bhatt A, Odujebe O, Bhatt S, Houry D. Uterine artery pseudoaneurysm rupture: A life-threatening presentation of vaginal bleeding. Ann Emerg Med 2010;55:460-3.
4. Ozdemir H, Ozturk T, Kocakoc E, Kayal A. Uterine arterial pseudoaneurysm: Transcatheter arterial embolization as a rare complication of Caesarean section. South Med J 2009;102:1176-8.
5. Wald DA. Postpartum hemorrhage resulting from uterine artery pseudoaneurysm. J Emerg Med 2003;25:57-60.
6. Yun SY, Lee DH, Cho KH, Lee HM, Choi YH. Delayed postpartum hemorrhage resulting from uterine artery pseudoaneurysm rupture. J Emerg Med 2012;42:e11-4.
7. Thompson W, Harper MA. Postpartum haemorrhage and abnormalities of the third stage of labour. In: Chamberlain G, Steer P, editors. Turnbull's Obstetrics. 3rd ed. Edinburgh: Churchill Livingstone; 2001. p. 619-33.
8. Khong TY, Khong TK. Delayed postpartum hemorrhage: A morphologic study of causes and their relation to other pregnancy disorders. Obstet Gynecol 1993;82:17-22.
9. Kuwata T, Matsubara S, Kaneko Y, Izumi A, Nakata M, Suzuki M. Asymptomatic uterine artery pseudoaneurysm after cesarean section. J Obstet Gynaecol Res 2010;36:405-10.
10. Eason DE, Tank RA. Avoidable morbidity in a patient with pseudoaneurysm of the uterine artery after cesarean section. J Clin Ultrasound 2006;34:407-11.
11. Vedantham S, Goodwin SC, McLucas B, Mohr G. Uterine artery embolization: An underused method of controlling pelvic hemorrhage. Am J Obstet Gynecol 1997;176:938-48.
12 Butori N, Coulange L, Filipuzzi L, Krausé D, Loffroy R. Pseudoaneurysm of the uterine artery after cesarean delivery: Management with superselective arterial embolization. Obstet Gynecol 2009;113:540-3.
12. Polat P, Suma S, Kantarcý M, Alper F, Levent A. Color Doppler US

in the evaluation of uterine vascular abnormalities. Radiographics 2002;22:47-53.

14. Rosenthal DM, Colapinto R. Angiographic arterial embolization in the management of postoperative vaginal hemorrhage. Am J Obstet Gynecol 1985;151:227-31.
15. Kovo M, Behar DJ, Friedman V, Malinger G. Pelvic arterial pseudoaneurysm-a rare complication of Cesarean section: Diagnosis and novel treatment. Ultrasound Obstet Gynecol 2007;30:783-5.
16. Burchell RC. Internal iliac artery ligation: Hemodynamics. Obstet Gynecol 1964;24:737-9.