Unusual presentation of more common disease/injury

Delayed postpartum haemorrhage secondary to a ruptured uterine artery pseudo-aneurysm, successfully treated by transarterial embolisation

Zoe Moatti,¹ Tamar Nisner,¹ Ashish Saini,² Mahantesh Karoshi¹¹Obstetrics and Gynaecology Department, Barnet General Hospital, London, UK;²Radiologist Department, Barnet General Hospital, London, UKCorrespondence to Dr Zoe Moatti, zmoatti@doctors.org.uk**Summary**

A 29-year-old woman (gravida 1, para 1) had an uneventful first pregnancy and a delivery by emergency caesarean section at term. The caesarean section was complicated by a massive obstetric haemorrhage of 5000 ml. After closure, an immediate re-laparotomy was indicated due to heavy vaginal bleeding. The site of bleeding was identified as an extension of the uterine incision, and was sutured. She was stabilised by transfusion of blood and blood products in the intensive therapy unit, and discharged 5 days later. The patient was re-admitted 6 weeks later with brisk, painless vaginal bleeding, passing large clots from a well-contracted uterus. Her haemoglobin decreased from 11.8 to 7.8 g/dl overnight. In view of her history, an urgent CT angiogram was performed, which revealed the presence of a pseudo-aneurysm arising from the left uterine artery. This was successfully occluded by transarterial embolisation, obviating the need for further surgical exploration.

BACKGROUND

This case demonstrates a rare but important cause of delayed postpartum haemorrhage with potentially life-threatening consequences, diagnosis of which is often unrecognised. Early CT angiography is widely available and recommended to allow a precise diagnosis and the planning of subsequent endovascular treatment.

CASE PRESENTATION

This 29-year-old Iranian woman had an uneventful first pregnancy and spontaneous labour at term of a 4100 g baby. Following a failed trial of instrumental delivery with ventouse and Neville-Barnes forceps, an emergency caesarean section was performed. The caesarean section was complicated by an extremely difficult delivery due to an impacted fetal head, and an extension of the uterine incision down to the cervix. After closure, the patient experienced sudden heavy vaginal bleeding which required detailed examination in the lithotomy position. Arterial bleeding was identified as coming from the left lateral vaginal apex, which was difficult to access by the vaginal route. An immediate re-laparotomy was performed, and a left uterine angle extension was identified and re-sutured. There was a massive obstetric haemorrhage with an estimated blood loss of 5000 ml. She was transferred to intensive therapy unit, and transfused six units of packed red cells and four units of fresh frozen plasma. She was discharged 6 days postnatally after stabilisation.

On postpartum day 42, the patient was re-admitted to accident and emergency with brisk, painless heavy vaginal bleeding described as 'a tap being turned on'. Her vital signs were within normal limits, she was apyrexial and her uterus was well-contracted.

Initially it was thought that she was experiencing a heavy period, and antifibrinolytics (tranexamic acid) was prescribed.

When her haemoglobin dropped from 12.3 to 7.8 overnight, an alternative cause for her bleeding was sought.

INVESTIGATIONS

CT angiogram of the uterine arteries revealed a pseudo-aneurysm in the region of the lower uterine segment/high vaginal vault, thought to be a branch of the left uterine artery (figure 1). High density thrombus was present within the endometrial cavity but no active haemorrhage at the time of the study. The patient was then referred to interventional radiology for embolisation.

DIFFERENTIAL DIAGNOSIS

- Menstrual period
- Secondary postpartum haemorrhage (PPH)
- Endometritis
- Retained products of conception.

TREATMENT

Non-selective diagnostic angiography confirmed the presence of a pseudo-aneurysm arising from an ascending cervical branch of the left uterine artery (figure 2). Transarterial embolisation was performed under local anaesthetic via a contralateral retrograde common femoral approach. This was selectively cannulated coaxially with a cobra C2 gli-decath (Cook, Bloomington, Indiana, USA) and a 2.7 Fr microcatheter (Terumo, Japan). The distal position of the pseudo-aneurysm would not allow passage of the microcatheter beyond the lesion but selective angiography demonstrated perfusion of the left side of the cervix with no flow to the contralateral side. Small embolic particles (Emboshpheres 500–700 micrometres) were used to slow flow into these distal branches prior to successful occlusion of the inflow with MR compatible microcoils (Cook,

Figure 1 CT angiogram reveals a pseudo-aneurysm in the region of the lower uterine segment/high vaginal vault, thought to be a branch of the left uterine artery.

Figure 2 Non-selective diagnostic angiography confirms the presence of a pseudo-aneurysm arising from a cervical branch of the left uterine artery.

Figure 3 Non-selective angiography did not demonstrate any further perfusion from the contralateral (right) internal iliac artery.

Bloomington, Indiana, USA). Non-selective angiography did not demonstrate any further perfusion from the contralateral (right) internal iliac artery (figure 3).

OUTCOME AND FOLLOW-UP

Successful occlusion of the uterine artery pseudo-aneurysm led to haemostasis, as demonstrated by angiography at the time of treatment and repeat CT angiography 3 days later. The patient was well at follow-up 5 weeks later, with no further vaginal bleeding. She was advised to opt for an elective caesarean section at 39 weeks in her next pregnancy.

DISCUSSION

Pseudo-aneurysm of the uterine artery is a rare but potentially life-threatening condition that often presents with a profuse, painless secondary postpartum haemorrhage (occurring 24 h or more after delivery).

More common causes of delayed PPH include retained products of conception or endometritis. However these typically present with pain and/or fever. Attempts to evacuate the uterus of retained products in the presence of a pseudo-aneurysm can worsen the bleeding.¹

As the diagnosis is often delayed or unrecognised, a high index of suspicion is needed in terms of previous obstetric and gynaecological history.

In obstetrics, trauma to the uterine arteries from caesarean section is the commonest cause of pseudo-aneurysm. This can be due to a lateral extension of the lower uterine segment incision and failure to secure the apex of the incision during repair, or if the operation was performed at advanced dilatation. However, pseudo-aneurysms have also been reported after normal vaginal delivery, possibly due to a true congenital aneurysm.¹⁻³

Pseudo-aneurysms are fragile as they lack the three arterial layers of a true aneurysm (tunica, media and adventitia). The boundaries most often are the surrounding tissues and blood clots, with a direct communication with the main artery through the injury to that artery. They can rupture with physical activity, or a rise in blood pressure.^{1 2}

Although angiography is considered the gold-standard method of investigation, Doppler has been shown to be an important diagnostic tool as well. Uterine artery embolisation is successful in arresting postpartum haemorrhage in stabilised cases.^{4 5}

Uterine artery embolisation is also used to treat immediate intractable postpartum haemorrhages not due to uterine atony, and is effective in the case of an adherent placenta (placenta percreta).⁶ Numerous case reports exist attesting to its use to treat life-threatening haemorrhage in gynaecological patients secondary to uterine curettage and gestational trophoblastic neoplasia.^{7 8}

Learning points

- ▶ High index of suspicion is required for brisk, painless postpartum haemorrhage, especially when other cause have been ruled out.
- ▶ Detailed obstetric history is needed, in particular if there has been a caesarean section with extension of the uterine incision, or surgery at advanced cervical dilatation.
- ▶ Angiography is the gold-standard for diagnosis. Although Doppler ultrasound has been used as an important diagnostic tool, CT offers several advantages. It is widely available, in and out of hours, allowing accurate diagnosis free of operator experience and also enabling the interventional radiologist to plan subsequent endovascular treatment.
- ▶ Multi-disciplinary approach is optimal, as treatment by embolisation alone is usually sufficient, obviating the need for often challenging surgery.

Acknowledgements The authors would like to acknowledge Kevin Lotzof for his radiological intervention for the successful treatment of the postpartum haemorrhage.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Abu-Ghazza O**, Hayes K, Chandraran E. Review of vascular malformations in relation to obstetrics and gynaecology: diagnosis and treatment. *J Obstet Gynaecol* 2010;**12**:87–93.
2. **Zimon AE**, Hwang JK, Principe DL, *et al*. Pseudoaneurysm of the uterine artery. *Obstet Gynecol* 1999;**94**(5 Pt 2):827–30.
3. **Mammen T**, Shanthakumari H, Gopi K, *et al*. Iatrogenic secondary postpartum haemorrhage: apropos of two uncommon cases. *Australas Radiol* 2006;**50**:392–4.
4. **Butori N**, Coulange L, Filipuzzi L, *et al*. Pseudoaneurysm of the uterine artery after cesarean delivery: management with superselective arterial embolization. *Obstet Gynecol* 2009;**113**(2 Pt 2):540–3.
5. **Kwon JH**, Kim GS. Obstetric iatrogenic arterial injuries of the uterus: diagnosis with US and treatment with transcatheter arterial embolization. *Radiographics* 2002;**22**:35–46.
6. **Barber JT Jr**, Tressler TB, Willis GS, *et al*. Arteriovenous malformation identification after conservative management of placenta percreta with uterine artery embolization and adjunctive therapy. *Am J Obstet Gynecol* 2011;**204**:e4–8.
7. **Craig S**, Permezel M, Thomson K. Angiographic transcatheter embolization in gynaecological practice. *Aust N Z J Obstet Gynaecol* 1997;**37**:118–20.
8. **Keepanasseril A**, Suri V, Prasad GR, *et al*. Management of massive hemorrhage in patients with gestational trophoblastic neoplasia by angiographic embolization: a safer alternative. *J Reprod Med* 2011;**56**:235–40.

This pdf has been created automatically from the final edited text and images.

Copyright 2011 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Moatti Z, Nisner T, Saini A, Karoshi M. Delayed postpartum haemorrhage secondary to a ruptured uterine artery pseudo-aneurysm, successfully treated by transarterial embolisation. *BMJ Case Reports* 2011;10.1136/bcr.05.2011.4270, Published XXX

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow