Postpartum Ovarian Artery Pseudoaneurysm Rupture: A Case Report

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Introduction

- Postpartum rupture of ovarian artery pseudoaneurysm (OAP) is a rare cause of secondary postpartum haemorrhage (PPH) but is potentially life-threatening.[1] Only 30 cases have been reported in the English literature since 1963.[2]
- It occurs most often in multiparous women and in the postpartum period.[3]
- This case followed normal vaginal delivery with subsequent presentation of symptoms common to less life-threatening postpartum conditions.
- The multiparous woman had a ruptured left ovarian artery pseudoaneurysm 2 days postpartum causing massive retroperitoneal haemorrhage and haematoma. It was diagnosed with abdominal/pelvic CTA and managed successfully by stenting, balloon occlusion and interventional radiological (IR) transarterial embolisation (TAE).

Patient Profile

- 41-year-old female
- **Medical History:** Previous meningitis, Thyroid scar
- **Medication History :** Valaciclovir last trimester neonatal HSV transmission prevention
- **No Known Drugs Allergies**
- **Surgical History:** Appendicectomy, Salpingectomy (side unknown), Dilation and Curettage (D&C)2021
- **Family History:** Sister – Ushers Syndrome
- **Social History:** Nil EtOH, nil smoker, nil recreational drugs
- **Obstetric History:**

  G9P7M2E1 - All babies delivered at term.
  G1- Ectopic pregnancy resulting in salpingectomy (patient unsure which side)
  G2 IVF - Blighted Ovum
  G3 IVF - SVD nil complications
  G4 IVF - SVD Twins complicated by 500ml PPH
  G5 - Ventouse delivery, nil complications
  G6 and G7 - SVD nil complications
  G8 - Early pregnancy miscarriage requiring D&C
  G9 - this pregnancy- Midwifery shared care model. Patient reports pregnancy more difficult than previous with increased lethargy otherwise low risk.
  Delivered at 39+6K SVD 3725g Male, 4-hour labour (previous 6–11 hour labours)
  Second Degree perineal tear
- Discharged next day

Case Summary

Peripheral Hospital

- Day 2 postpartum 7th delivery–sudden onset 9/10 left lower quadrant pain
- Deterioration with abdominal pain and haemorrhagic shock (Systolic BP 50 & HR 65)
- CTA abdomen/pelvis: a large a 21x17x14cm retroperitoneal haematoma see Fig 1. An 18mm irregular pseudoaneurysm most likely representing the left ovarian artery pseudoaneurysm. Incidental 12mm right uterine artery pseudoaneurysm (UAP). Mildly ectatic segments in left uterine artery.

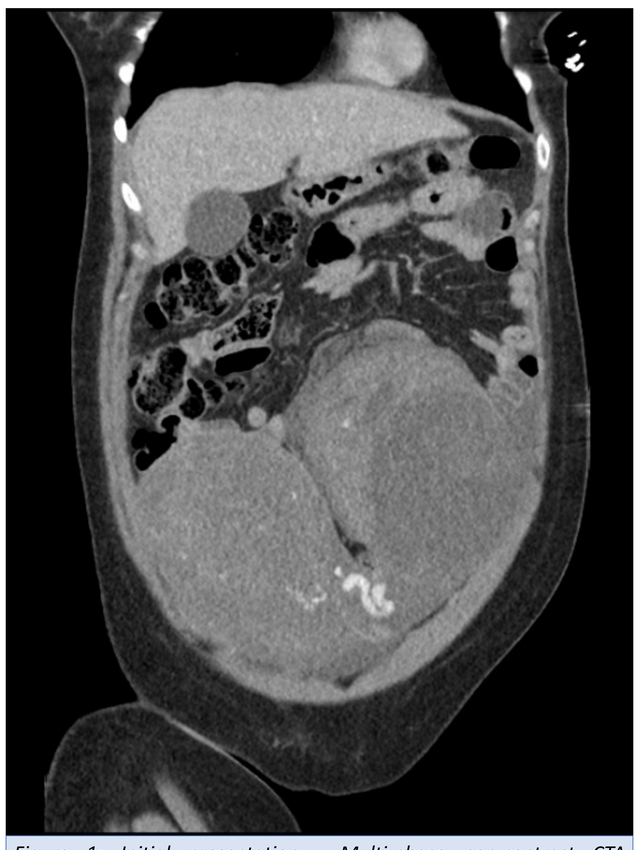

Figure 1: Initial presentation - Multi-phase non-contrast CTA abdomen/pelvis shows a 21x17x14cm acute haematoma left lower abdomen causing deviation of uterus to the right. Mildly ectatic segments in left uterine artery.

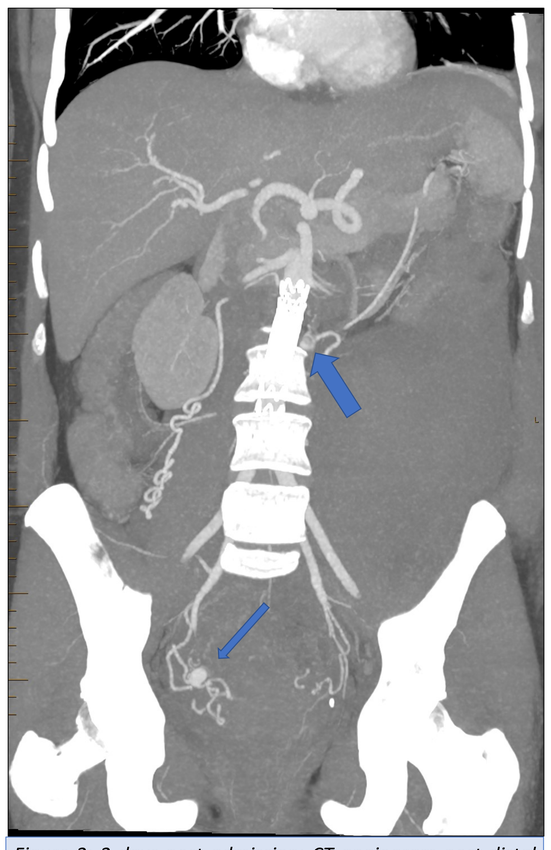

Figure 2: 2 days post admission: CT angiogram post distal aorta stenting procedure (seen midline). The thick arrow represents the left ovarian artery pseudoaneurysm (18 x 14mm). The thin arrow representing an incidental finding of an unruptured right uterine artery pseudoaneurysm (13 x 11mm).

Case Summary Cont.

- Likely cause of haematoma: ruptured L OAP.
- Red blanket helicopter transfer to RBWH for vascular surgery input.
- Aggressive fluid resuscitation for haemodynamic stabilisation: 2L albumin, 1L Hartmann's and 3U packed red blood cells (PRBC).

Transfer to RBWH

- Continued fluid resuscitation: 2L crystalloid, 1L colloid, 4U PRBC, 16U cryoprecipitate and 1 g Tranexamic Acid (TXA)
- Vascular surgery noted active contrast blush corresponding to rupture L ovarian artery pseudoaneurysm. No active bleed in R ovarian artery
- Stent distal aorta extending infrarenal to bifurcation covering ovarian arteries bilaterally.
- Repeat CTAs: patent stent, initial decrease in LOAP, ROAP and RUAP, stable size haematoma, however day 8 increase in haematoma size and low flow refilling LOAP
- Day 15 Post Surgery.: Bilateral uterine artery IR embolisation with gelatin sponge slurry to halt forward flow to ovarian artery. Haematoma left in-situ
- Unclear reason for bleed- genetic testing advised. Systolic murmur- Flow murmur in pseudoaneurysm setting may indicate connective tissue disorder but no suggestive history.
- Day 19 RBWH: discharged
- 3/12 post: Haematoma 55mm (was 145mm). Occasional LLQ pain likely due to haematoma insitu. Genetic tests await.

Discussion

- Diagnosing UAP and OAP is challenging due to rarity, often unrecognized until rupture. PPH (slow to gross bleeding) most often occurs 1 to 6 days postpartum.[4]
- Pelvic trauma, increased pressure (hypertension, gravid uterus on aorta) and increased utero-ovarian perfusion can cause rupture and rapid clinical decline.[5] Trauma includes childbirth (vaginal delivery and caesarean) and local surgery (curettage, egg harvest and hysterotomy).[6] This patient had 7 deliveries, IVF ovum harvest , laparoscopic salpingectomy , blighted ovum, D&C and appendectomy. All have potential to cause trauma to the uterine vasculature.
- Multiparity is the most significant risk factor for OAP/UAP.[3] Increased oestragen and progesterone promotes fibromuscular dysplasia of tunica media and fragmentation of elastic fibres, potentially degenerating arterial walls.[7] Structurally, ovarian arteries are lengthy and convoluted. In pregnancy, total blood volume increases by 50%, increasing utero-ovarian perfusion and likelihood of pseudoaneurysm[5]. Patients with congenital malformations such as absent or small ovarian or uterine arteries should be identified. Pregnancy related hypertrophy of these vessels increases flow and stress, weakening vessels and increases susceptibility to aneurysm formation and rupture.
- Vasculitis or connective tissue disorders may predispose patients to OAP.[2] This patient had an auto-immune vasculitis screen which yielded a positive anti-nuclear antibody which is non-specific to any vascular disease.
- Due to diverse clinical presentation of secondary PPH the differential diagnosis should include UAP or OAP.[8] Conventional angiography, ultrasound and CT angiography are effective in noninvasive detection.
- Due to rarity, there is no consensus treatment algorithm for OAA/OAP rupture.[9] For emergency cases, life saving measures of surgery, ligation, stenting and balloon occlusion are used. Distal aortic stenting was implemented in this haemodynamically unstable patient, reducing ante grade flow from aorta to ruptured LOAP to reduce blood loss and aid occlusion. TAE of uterine arteries was used to stem retrograde flow in LOAP. TAE has gained favour in hemodynamically stable patients due to lower perioperative risk, the potential for fertility preservation, shorter hospital stays, and less invasive nature.[3, 5, 9]
- Management should be multidisciplinary, as interventional radiology remains the main tool for definitive diagnosis and treatment.[10] The procedure is 93% to 96% successful[11]. After IR embolisation patients should have follow up imaging to confirm resolution of the pseudoaneurysm.

Conclusion

Uterine and ovarian artery pseudoaneurysms are rare vascular lesions that on rupture may be life threatening if not diagnosed and properly treated. Individual patient risk factors should be considered This case serves as a reminder to clinicians to consider rupture of such lesions in sudden onset hypogastric or flank pain and haemorrhage in pregnancy, postpartum haemorrhage and trauma not directly associated with pregnancy. Angiography with embolization has replaced open surgery as the treatment of choice for such lesions in haemodynamically stable patients.

References

1. Ola et al., *J Obstet Gynaecol India,* 2015, https://doi:10.1007/s13224-014-0613-5
2. Arleo et al., *J Clin Imaging Sci,* 2022, https:// doi: 10.25259/JCIS_145_2021
3. Nakajo et al., *Acta Radiologica,* 2005, https://doi: 10.1080/02841850500270332.
4. Parr et al., *Proc (Bayl Univ Med Cent)*,2018, https://doi:10.1080/08998280.2017. 1400301
5. Toyoshima et al., *J Med Case Rep,* 2015, https:// doi: 10.1186/s13256-015- 0553-4
6. Chummun et al., *Obstet Gynecol,* 2015, https:// doi: 10.1097/AOG.0000000000000849.
7. Nolte et al., *J Vasc Surg, 1995,* https://doi.org/10.1016/S0741-5214(95)70296-2
8. Bhatt et al., *Ann Emerg Med,* 2010, https:// doi: 10.1016/j.annemergmed.2010.01.026
9. Kirk et al., *J Vasc Surg,* 2009, https://doi.org/10.1016/j.jvs.2008.07.008
10. Abu-Ghazza et al., *Obstet Gynecol,2010* https://: doi: 10.1576/toag.12.2.087.2757
11. Olowoyeye OA., J Vasc Ultrasound. 2012, https://doi.org/10.1177/154431671203600304

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