

Uterine Artery Pseudoaneurysm after Total Abdominal Hysterectomy Managed by Ultrasound-guided Percutaneous Glue Injection

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Abstract

Uterine artery pseudoaneurysm (UAP) following abdominal hysterectomy is an uncommon complication. However, it can cause life-threatening bleeding, necessitating early diagnosis and intervention. Imaging is vital in its prompt diagnosis and aids in planning interventions. Here, we describe a case of recurrent massive per-vaginal bleeding from a left UAP developed following total abdominal hysterectomy and bilateral salpingo-oophorectomy. Bleeding was successfully managed with percutaneous ultrasound-guided glue (N-butyl cyanoacrylate) injection into the aneurysmal sac. The patient is doing well without any recurrent bleeding.

Keywords: Glue therapy, ultrasound, uterine artery pseudoaneurysm, vaginal bleeding

INTRODUCTION

Although an uncommon entity, uterine artery pseudoaneurysm (UAP) is a known complication of gynecological surgeries.^[1] UAP may lead to significant morbidity and mortality unless treated expeditiously. Imaging plays a crucial role in accurately diagnosing and planning therapeutic interventions.^[2,3] The interventional radiological approach is increasingly used to treat bleeding from the uterine artery, obviating the need for surgery.^[4-6] Here we describe a case of bleeding UAP that developed following an abdominal hysterectomy. It was successfully managed with direct percutaneous glue injection using ultrasound guidance. This article also briefly discusses the advantages and disadvantages of percutaneous glue injection in managing visceral pseudoaneurysms.

CASE REPORT

A 47-year-old woman (P2 L2) had undergone a total abdominal hysterectomy with bilateral salpingo-oophorectomy (TAH + BSO) in an outside hospital for abnormal uterine bleeding. The postoperative period was uneventful, and she was discharged on the 3rd postoperative day. The patient

developed sudden onset of heavy per vaginal bleeding following 2 months of TAH + BSO, for which she was admitted outside and conservatively managed with tranexamic acid and antibiotics. After 1 month, she again developed a similar episode of sudden-onset heavy vaginal bleeding with a drop in hemoglobin to 6 g/dL. The patient was referred to our gynecology emergency after receiving three units of packed red blood cell (PRBC), tranexamic acid, and antibiotics. The blood pressure was 96/64 mmHg, with a heart rate of 108 beats/min. She bled for the third time in the emergency room, where she received resuscitative measures, including intravenous fluid, noradrenaline, and antibiotics.

Emergency transabdominal ultrasonography (USG) revealed a cystic lesion in the region of the vaginal vault with a turbulent color flow within, suggestive of an arterial pseudoaneurysm [Figure 1]. Pelvic computed tomography (CT) angiography confirmed a pseudoaneurysm of size 16 mm × 20 mm, arising from the left uterine artery

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Received: 20-03-2023 Revised: 07-04-2023 Accepted: 26-04-2023 Available Online: 07-07-2023

Access this article online

Quick Response Code:



Website:
<https://journals.lww.com/jmut>

DOI:
10.4103/jmu.jmu_31_23

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How to cite this article: Devi YS, Patel RK, Tripathy TP, Jena S. Uterine artery pseudoaneurysm after total abdominal hysterectomy managed by ultrasound-guided percutaneous glue injection. J Med Ultrasound 2024;32:252-4.

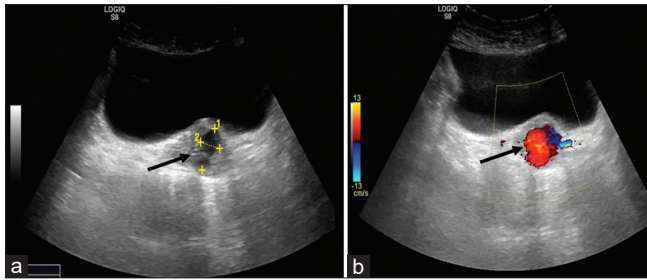


Figure 1: Transabdominal USG shows a well-defined thick-walled anechoic cystic lesion (arrow a) in the region of the vaginal vault with the turbulent flow (arrow b) on Doppler imaging, suggestive of arterial pseudoaneurysm. UB: Urinary bladder, USG: Ultrasonography

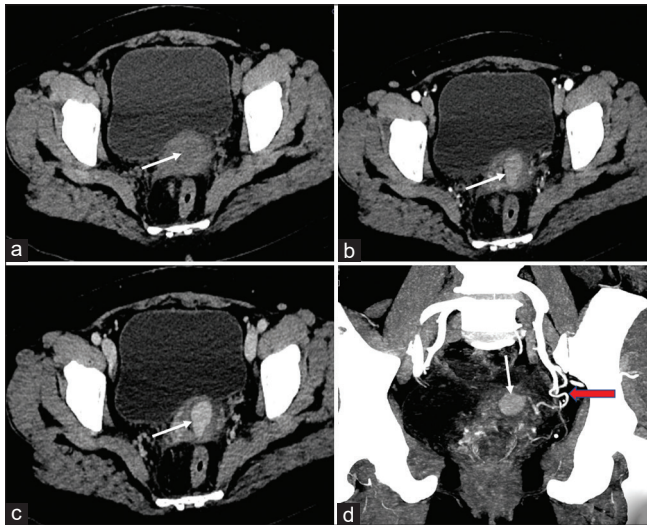


Figure 2: Axial noncontrast (a), Arterial (b), and venous phase (c) images show a saccular contrast-filled outpouching (White arrow is marked to highlight the site of pathology in a multiphasic CT pelvis.) in the vaginal vault region with no change in shape and size in the venous phase, suggestive of an arterial pseudoaneurysm; Coronal MIP (d) Image shows the pseudoaneurysm, arising from the left uterine artery (red arrow d). MIP: Maximum intensity projection

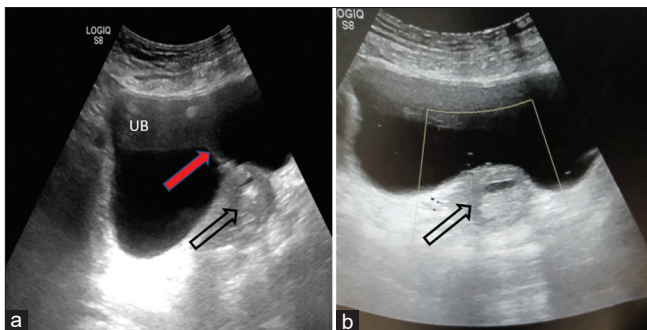


Figure 3: Pseudoaneurysm (open black arrow a) was accessed through the percutaneous transcystic route using a 22G Chiba needle (red arrow a) and 0.5 mL of 33% glue (N-butyl cyanoacrylate)-Lipiodol mixture was injected; postembolization image (b) Shows echogenic content within the pseudoaneurysm with no residual flow on Doppler, suggestive of complete thrombosis. A note is made of a few floating echogenic debris within the UB, as seen in image (b), due to the dislodgement of a few glue-Lipiodol particles into the UB lumen UB while removing the Chiba needle. UB: Urinary bladder

stump with a narrow neck. No active contrast extravasation was noted [Figure 2]. Given the easy accessibility of the uterine artery pseudoaneurysm (UAP) through a percutaneous route, USG-guided percutaneous glue injection was planned.

The urinary bladder was retrogradely filled with saline through the Foley's catheter to improve the acoustic window. After local part preparation, the UAP was punctured under the USG guidance using a 22G–15 cm Chiba needle through the distended bladder [Figure 3a]. The needle was flushed with 5% dextrose solution, followed by the instillation of 0.5 mL mixture of N-butyl cyanoacrylate (NBCA) and Lipiodol in 1:2 ratio (33% mixture) into the UAP under the real-time USG guidance. The needle was then removed after flushing with the dextrose solution. Repeat USG following glue injection revealed an echogenic thrombus within the UAP with no residual flow on Doppler imaging, suggesting complete obliteration [Figure 3b]. No further episode of bleeding was noticed. The patient received two units of PRBC on the following days. She was discharged in a hemodynamically stable condition on the 6th day of embolization.

The patient had no further episodes of bleeding. Even after 9 months of embolization, she is doing well without recurrent bleeding, dyspareunia, or local site pain.

DISCUSSION

Unless treated expeditiously, UAP can cause torrential bleeding, increasing morbidity and mortality. Traumatic injury of the uterine artery wall leads to UAP. Thus, UAP should be considered a differential for vaginal bleeding in the postoperative or postpartum period.^[1] UAP can also occur after dilatation and curettage, myomectomy, and even after an uncomplicated vaginal delivery.^[2] Our patient developed UAP after TAH + BSO.

Ultrasound with Doppler imaging plays a major role in its early detection. Transvaginal USG can also identify the smaller pseudoaneurysm due to its high resolution. CT angiography aids in detailed vascular mapping, which is essential before any intervention.^[1,3]

Bleeding from UAP was conventionally managed with surgical exploration, including internal iliac artery ligation. Today, image-guided embolization is increasingly used due to its minimally-invasive nature, which obviates major surgery.^[1,4-7] Zimon *et al.* reported a case of UAP in the immediate postpartum period, which was successfully treated with left uterine artery embolization.^[4] Similarly, Glassman *et al.* managed two cases of UAP following cesarean section by endovascular embolization.^[5] Boi *et al.* reported two cases of UAP, one following surgical excision of ovarian endometriosis and the other following cesarean section. In both cases, pseudoaneurysm was managed with transarterial embolization using larger polyvinyl alcohol (PVA) particles (700–1000 μ) and microcoils.^[6] Miligkos *et al.* reported a similar case after a laparoscopic hysterectomy. The patient presented with delayed heaving vaginal bleeding, managed by endovascular embolization using PVA particles

and microcoils.^[7] It is noteworthy to mention that small UAP may respond to only conservative treatment at times. In a recent series of UAP by Wu *et al.*, two out of nine females responded to conservative management while remaining severe required transarterial embolization.^[1]

The direct percutaneous injection is an alternative technique to manage superficial and visceral pseudoaneurysms.^[8] Percutaneous glue embolization has several advantages, including minimal invasiveness (i.e., no need for arterial catheterization), speed, and potential decrease of radiation exposure. The direct percutaneous approach allows embolization of pseudoaneurysm where endovascular catheterization of the feeding artery is not possible. In addition, glue is readily available and inexpensive. Furthermore, percutaneous glue embolization obviates the usage of expendable materials, such as catheters and microcatheters, guide wires, contrast media, and vascular closure devices, thereby reducing the procedural cost. Of note, percutaneous glue embolization may be complicated by the inadvertent spillage of glue into the parent artery.^[9] In some locations, the pseudoaneurysm may not be accessible for percutaneous embolization. The present case had a narrow neck UAP. Hence, NBCA could be injected safely, and no complication was observed.

For percutaneous embolization, the pseudoaneurysm is accessed under USG/CT guidance using an 18–22G needle. Percutaneous angiography is performed through the needle to assess the size of the pseudoaneurysm, feeding artery, and flow dynamics. Embolization is then done using either NBCA with Lipiodol, thrombin, or coil. Both USG and fluoroscopic guidance are often used during embolization. Simultaneous transarterial angiogram better delineates the arterial and aneurysmal anatomy and helps confirm the complete pseudoaneurysm embolization.^[9–11] In our case, the UAP was easily accessible under USG guidance. Due to the nonavailability of thrombin, we used NBCA (glue), which is much cheaper than thrombin.

Thrombin injection under transvaginal sonographic guidance has also been described to treat UAP.^[10] Direct percutaneous embolization using glue has also been reported for uterine arteriovenous malformations.^[11] The direct percutaneous approach could benefit pregnant patients necessitating embolization for UAP since it avoids radiation exposure.

CONCLUSION

UAP is a rare complication after a TAH. Whenever feasible,

USG-guided glue injection is a viable and cheaper approach to manage such UAP. Percutaneous embolization of UAP using NBCA has not been reported before, which makes our case report unique.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Wu T, Lin B, Li K, Ye J, Wu R. Diagnosis and treatment of uterine artery pseudoaneurysm: Case series and literature review. *Medicine (Baltimore)* 2021;100:e28093.
2. Wang J, Yang Q, Zhang N, Wang D. Uterine artery pseudoaneurysm after treatment of cesarean scar pregnancy: A case report. *BMC Pregnancy Childbirth* 2021;21:689.
3. Karmous N, Ayachi A, Derouich S, Mkaouer L, Mourali M. Rupture of uterine artery pseudoaneurysm: Role of ultrasonography in postpartum hemorrhage management. *Pan Afr Med J* 2016;25:136.
4. Zimon AE, Hwang JK, Principe DL, Bahado-Singh RO. Pseudoaneurysm of the uterine artery. *Obstet Gynecol* 1999;94:827-30.
5. Glassman D, Karsalia R, Moubarak I, Sauer MV, Singla A. Postpartum hemorrhage caused by uterine artery pseudoaneurysm: A case report. *Case Rep Womens Health* 2021;29:e00286.
6. Boi L, Savastano S, Beghetto M, Dall'Acqua J, Montenegro GM. Embolization of iatrogenic uterine pseudoaneurysm. *Gynecol Minim Invasive Ther* 2017;6:85-8.
7. Miligkos DS, Loudon K, Page A, Behrens R. Uterine artery pseudoaneurysm following laparoscopic hysterectomy. An unusual cause of delayed heavy vaginal bleeding. *Gynecological Surgery* 2013;10:223-5.
8. Madhusudhan KS, Venkatesh HA, Gamanagatti S, Garg P, Srivastava DN. Interventional radiology in the management of visceral artery pseudoaneurysms: A review of techniques and embolic materials. *Korean J Radiol* 2016;17:351-63.
9. Gorski U, Chaluvashetty S, Kalra N, Kang M, Bhatia V, Lal A, *et al.* Percutaneous glue embolization as a primary treatment for visceral pseudoaneurysms. *Minim Invasive Ther Allied Technol* 2020;29:170-6.
10. Ros C, Barnes D, Fervienza A, Osés G, Alcázar JL, Martínez-Román S, *et al.* Ultrasound-guided transvaginal thrombin injection of uterine arteries pseudoaneurysms. *Br J Radiol* 2017;90:20160913.
11. Kuc N, Gans JH, Wattamwar K, Hirschl D, Golowa Y, Cynamon J. Direct percutaneous embolization of uterine arteriovenous malformations. *J Vasc Interv Radiol* 2022;33:607-9.