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Addressing the Uncommon: Effective Management of Uterine Artery Pseudoaneurysm Post-IUCD Removal through Advanced Embolization Techniques

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Abstract

Uterine artery pseudoaneurysms (UAPs) are rare but potentially life-threatening complications that can occur after procedures such as intrauterine contraceptive device (IUCD) removal. This case report describes a 28-year-old woman who experienced severe vaginal bleeding and anemia following the removal of her IUCD, which had been in place for eight years, exceeding the recommended duration. Despite her previously regular menstrual cycles, she presented with significant bleeding, requiring multiple blood transfusions.

Diagnostic imaging, including color and spectral Doppler ultrasound, revealed a 1.8x1.5 cm hypoechoic structure near the uterine fundus with a 'Yin-Yang' pattern, indicative of a pseudoaneurysm. Dynamic Contrast Enhanced Magnetic Resonance Angiography (MRA) confirmed the findings. The patient underwent transarterial embolization (TAE) under local anesthesia, which involved selective catheterization and embolization of the uterine artery supplying the pseudoaneurysm with a glue-lipiodol mixture. Post-procedure imaging confirmed the complete resolution of the pseudoaneurysm and cessation of bleeding.

This case highlights the critical need for early diagnosis and management of UAPs, especially after IUCD removal. Transarterial embolization proved to be a safe and effective treatment, successfully controlling symptoms and preserving fertility. This report underscores the importance of prompt intervention and

ongoing vigilance in managing such rare but significant complications.

Keywords: UAE, IUCD, Uterine Artery Embolization, Pseudoanuerysm

Introduction

Uterine artery pseudoaneurysms (UAPs) are uncommon but potentially dangerous conditions, with their exact prevalence being unclear. These pseudoaneurysms can occur following various procedures or events such as the use of an intrauterine device, traumatic deliveries, abortion, caesarean sections, manual removal of the placenta, deliveries with forceps, vacuum extraction, or dilation and curettage (D&C)[1,2,3]. Uterine artery pseudoaneurysms (UAPs) typically do not exceed 30 mm in diameter[4]. Their clinical presentation can range from asymptomatic to causing symptoms such as pelvic pain or severe uterine bleeding in some instances [5].

When diagnosing uterine artery pseudoaneurysms (UAPs), it's important to differentiate them from acquired and congenital arteriovenous malformations (AVMs), which are characterized by a network of mixed arteries and veins. The diagnosis of UAPs is typically made using color and spectral Doppler ultrasound, with angiography used for secondary confirmation. Dynamic Contrast Enhanced Magnetic Resonance Angiography has a crucial role in differentiating between the two entities. AVMs show early contrast enhancement of draining veins along with arterial enhancement whereas pseudoaneurysms show no such venous communication. Angiography is regarded as the gold standard for verifying uterine vascular lesions.

Pseudoaneurysms have a characteristic sonographic appearance, manifesting as a pulsating anechoic or hypoechoic structure connected to the parent artery by a thin vascular neck. Spectral Doppler presents turbulent arterial blood flow with a ‘to and fro’ pattern in UAPs [4,6,7]

Arterial embolization is the preferred treatment for uterine artery pseudoaneurysms (UAP) due to its ability to preserve fertility. This technique, involving the embolization of the uterine arteries, is both effective and safe for managing UAP symptoms when performed at facilities skilled in intravascular procedures. For postmenopausal patients, a hysterectomy is typically recommended[3,5,6,8]. Laparoscopic approaches are infrequently used for this condition[9] .

Case Report

We present a case of a 28-year-old female who was admitted to the hospital after she complained of heavy vaginal bleeding for around 7 days soaking 10-12 pads per day. Her medical history revealed history of a normal vaginal delivery eight years back, post which an intrauterine contraceptive device was inserted for a period of five years. However, the patient got the device removed beyond the approved period after eight years. The patient complained of heavy bleeding post intrauterine device removal. Prior to that, her menstrual cycle was regular. Her Hemoglobin on presentation was 6.5 gm%, and she had total 4 unit packed cell transfusions during her bleeding history.

The patient was referred to Department of Interventional Radiology for further management.

Ultrasound revealed a large round hypo echogenic structure of size 1.8x1.5cm near the uterine fundus on right side protruding into the endometrial cavity. On Colour Doppler, swirl of colours seen with ‘Yin-Yang’ pattern suggestive of pseudo aneurysm (Figure 1).

Dynamic Contrast Enhanced Magnetic Resonance Angiography (MRA) was also done which confirmed the above-mentioned findings (Figure 2).

Patient was taken up for Embolization of the pseudo aneurysm. After taking informed written consent, uterine artery embolization (UAE) was done under local anesthesia. Angiography revealed a pseudo aneurysm arising from branches of right uterine artery which were selectively catheterized using microcatheter and embolized using glue-lipiodol combination. Post embolization, there was complete disappearance of the pseudo aneurysm (Figure 3). Selective angiogram from left uterine artery did not reveal any other vascular abnormality.

The patient was monitored in the ward for two days post procedure, during which she did not complain of any further episode of bleeding. Ultrasound done immediately post procedure and two days later revealed complete thrombosis of the pseudo aneurysm with no internal colour flow (Figure 4). The embolization not only addressed the immediate risk of rupture but also alleviated the patient's symptoms. Post-procedure follow-up confirmed resolution of the pseudoaneurysm and significant improvement in the patient's clinical condition. The patient's recovery was closely monitored, with no evidence of complications related to the embolization or the original UAP. Follow-up imaging confirmed the absence of residual or recurrent pseudoaneurysm.

Discussion

The precise frequency of uterine artery pseudoaneurysm (UAP) in women is still unknown, and it has traditionally been considered "very rare." Nonetheless, according to Baba et al., UAP may be more common than previously thought, occurring in about 3 to 6 cases per 1,000 deliveries[4]. This implies that many cases might be asymptomatic or resolve on their own, going undiagnosed. Given that UAP can lead to severe hemorrhage, early recognition and diagnosis by obstetricians and gynecologists are crucial.

Uterine artery pseudoaneurysm (UAP) is a rare but serious complication that can arise following the removal of an intrauterine contraceptive device (IUCD). Complications associated with intrauterine contraceptive device. Removal include pain, bleeding and intrauterine infection[10]. The reported rare complications in literature during contraceptive device removal include uterine artery rupture [10] and perforation. However, detailed search of the literature did not yield any case report for pseudoaneurysm arising post intrauterine contraceptive device removal, thereby highlighting the rarity of the case. In this case, the patient presented with symptoms consistent with a UAP, including abnormal vaginal bleeding and pelvic pain. These symptoms are not uncommon following IUCD removal, as the procedure can occasionally lead to vascular injuries. However, in the absence of a prior operative trauma, such presentations can be challenging to attribute to a UAP, making initial diagnosis difficult. Given the risk of potentially life-threatening hemorrhage associated with UAP rupture, the patient's clinical symptoms warranted prompt and thorough investigation.

Transarterial embolization (TAE) was chosen as the management strategy for this UAP. TAE is a minimally invasive procedure that involves the selective occlusion of the uterine artery feeding the pseudoaneurysm, effectively controlling bleeding and reducing the risk of rupture. This approach is particularly advantageous for preserving fertility, a critical consideration given the patient's reproductive health[8].

This case underscores the importance of early detection and appropriate management of UAPs, particularly following procedures like IUCD removal. While UAPs are rare, they pose significant risks if not promptly

identified and treated. Transarterial embolization represents a valuable treatment option, offering effective control of bleeding and preservation of fertility. Clinicians should remain vigilant for signs of UAP in patients with relevant procedural histories and consider TAE as a primary intervention for managing this potentially life-threatening condition.

The successful management of the patient through TAE not only addressed the immediate clinical concerns but also highlighted a valuable approach for future cases. Prompt recognition and effective treatment of UAPs are crucial in mitigating risks and ensuring positive patient outcomes.

Conclusion

Transarterial embolization offers an effective solution for controlling bleeding and preserving fertility in UAP cases. Clinicians should remain alert to the possibility of UAP in patients with relevant procedural histories, considering UAE as a first-line treatment to mitigate risks and improve patient outcomes. Early diagnosis and management are crucial to preventing severe complications and ensuring optimal recovery.

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Legend Figures

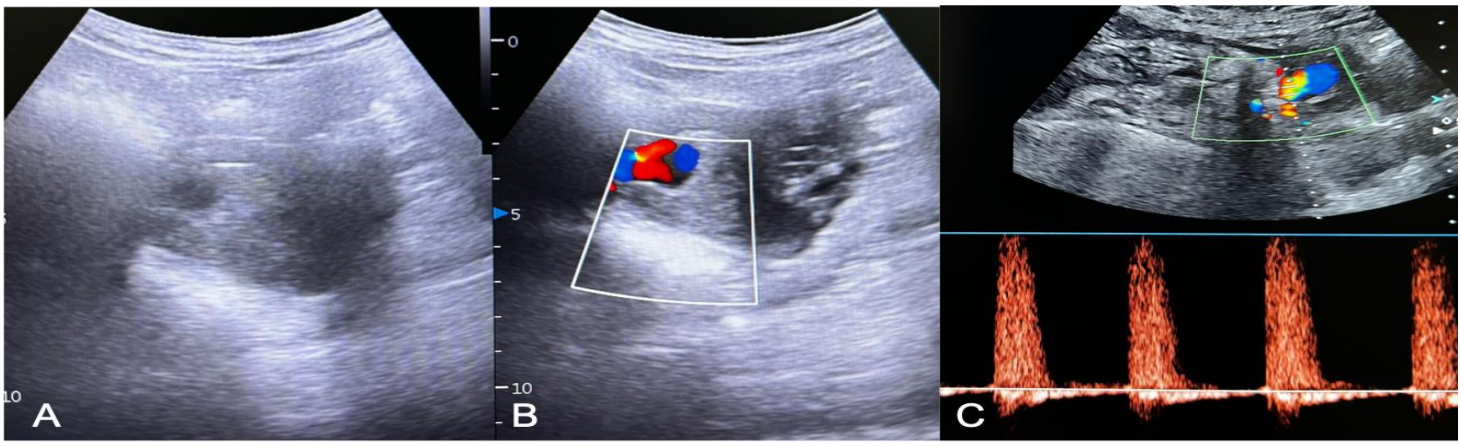

Figure 1 (A-C): Transverse grey scale ultrasound image showing a round hypoechogenic lesion in uterus (white asterisk) (A). Colour Doppler image of the same lesion showing "Yin-Yang" pattern (B). Spectral Doppler showing to and fro pattern (C)

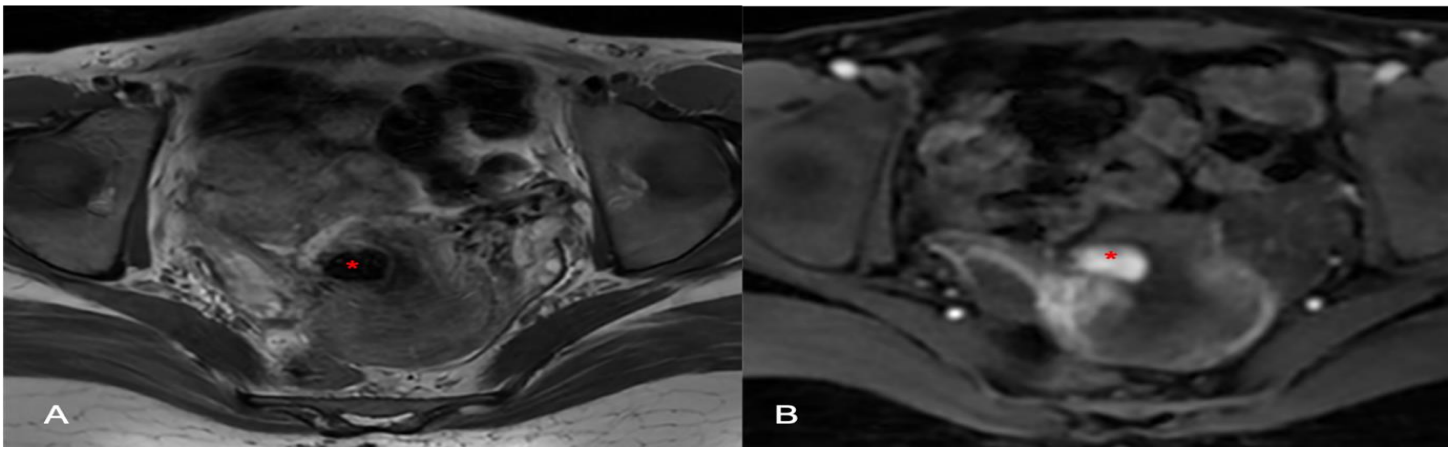

Figure 2 (A-B): T2 weighted axial Magnetic Resonance Image showing a large flow void lesion (Red asterisk) in the uterine myometrium on right side projecting into the endometrial cavity (A). T1w post Gadolinium axial image showing intense enhancement of the lesion in the early arterial phase without any enhancement of early draining veins (B).

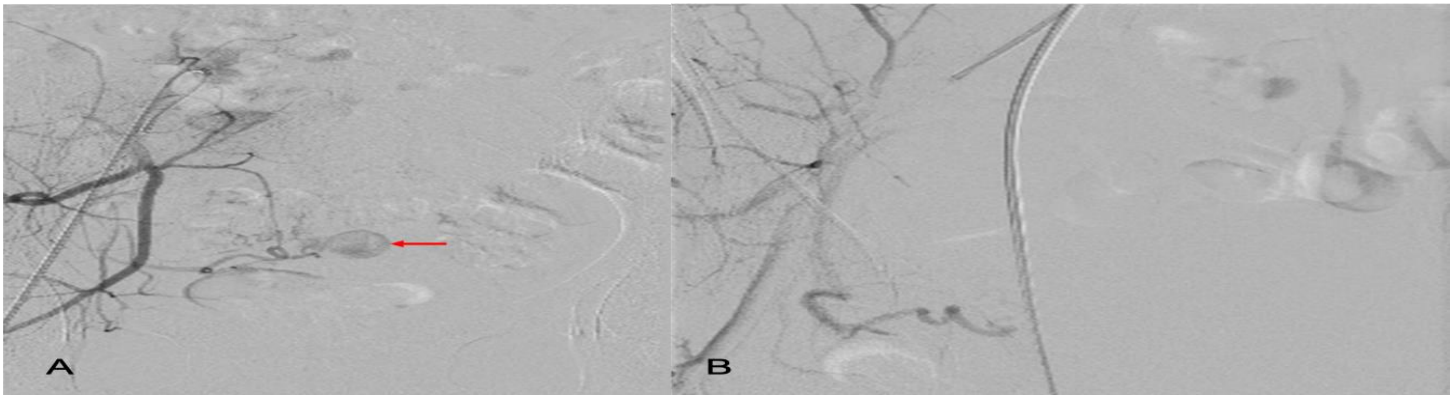

Figure 3 (A-B): Digital subtraction Angiography (DSA) image showing pseudoaneurysm (Red arrow) arising from right uterine artery branch (A). Post embolization angiography image showing complete disappearance of the pseudoaneurysm (B).

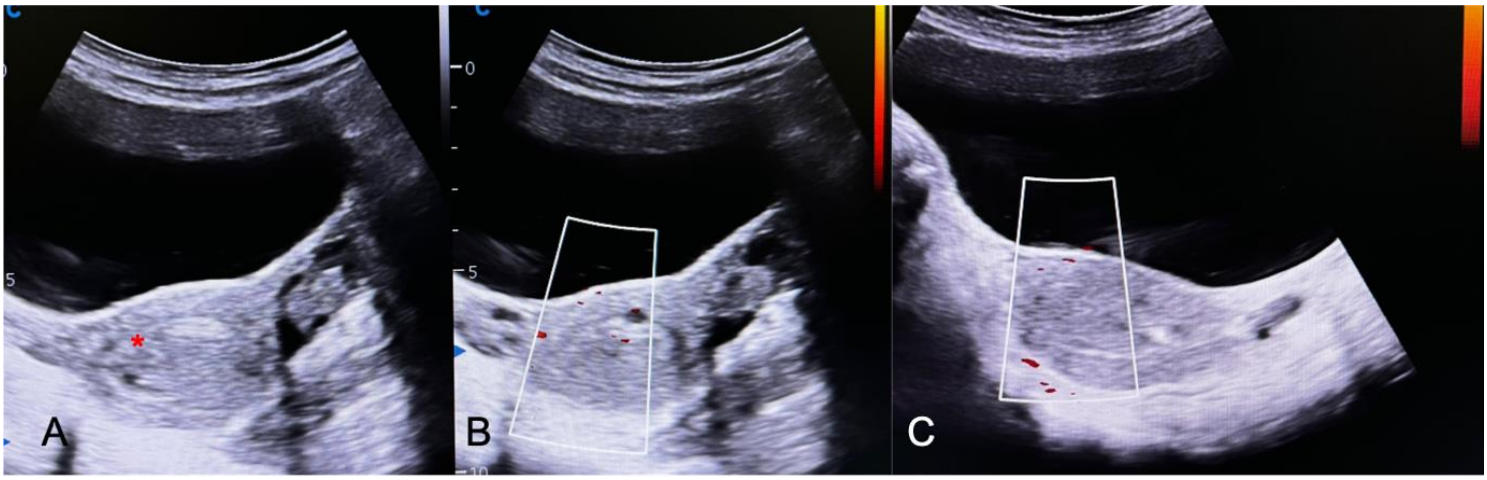

Figure 4 (A-C): Grey scale transverse ultrasound image showing complete thrombosis of the pseudoaneurysm (Red asterisk) (A). Power Doppler images showing no colour flow in the pseudoaneurysm (B, C)