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Case Report

A dangerous mimic of retained products of conception: acquired uterine arteriovenous malformation

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ABSTRACT

Uterine arteriovenous malformation (AVM) is a rare but potentially life-threatening vascular abnormality characterized by abnormal communication between uterine arteries and veins without an intervening capillary bed. Although congenital AVMs occur infrequently, acquired lesions are increasingly recognized following uterine instrumentation, caesarean delivery, miscarriage, or dilation and curettage. Early diagnosis is essential because inappropriate uterine evacuation may precipitate catastrophic hemorrhage. This report demonstrates a case of a 28-year-old multiparous woman who presented with severe vaginal bleeding one month after suction evacuation for a missed abortion at 12 weeks of gestation. On admission, she was hemodynamically stable but moderately anemic with a hemoglobin of 9 g/dl and serum β -human chorionic gonadotropin (β -hCG) of 73.72 mIU/ml. Transvaginal ultrasonography with color Doppler demonstrated multiple tortuous vascular channels within the posterior myometrium exhibiting high-velocity turbulent flow suggestive of uterine AVM. Computed tomography angiography confirmed an acquired AVM involving branches of the uterine artery. The patient underwent successful bilateral uterine artery embolization using foam gel particles, resulting in immediate cessation of bleeding. Repeat evacuation for retained products of conception was safely performed after embolization. She recovered uneventfully and was discharged on postoperative day four. This case highlights the importance of considering uterine AVM in women presenting with delayed post-abortion hemorrhage. Prompt diagnosis using Doppler ultrasonography and CT angiography followed by uterine artery embolization can effectively control bleeding while preserving fertility.

Keywords: Uterine arteriovenous malformation, Delayed post-abortion hemorrhage, Uterine artery embolization, Color Doppler, Acquired AVM

INTRODUCTION

Uterine arteriovenous malformation (AVM) is an uncommon vascular anomaly resulting from abnormal direct communication between arteries and veins without an intervening capillary network. These lesions may be congenital or acquired, with acquired AVMs accounting for the majority of reported cases. They usually develop following trauma to the uterine wall such as curettage, cesarean section, abortion, myomectomy, gestational trophoblastic disease, or pelvic surgery.^{1,2,3} In a study of

almost 1000 patients in which all women were screened for uterine vascular malformation after delivery or abortion, only 6 had a uterine vascular malformation and only 1 (0.10%) had an arteriovenous malformation.³

Patients commonly present with recurrent or massive vaginal bleeding, which may lead to severe anemia or hypovolemic shock. The clinical presentation often resembles retained products of conception, gestational trophoblastic disease, or dysfunctional uterine bleeding, making diagnosis challenging. Colour Doppler

ultrasonography is the preferred imaging modality because it demonstrates multiple serpiginous vascular channels with high-velocity, low-resistance blood flow. CT angiography or digital subtraction angiography confirms the diagnosis and delineates vascular anatomy before intervention.^{1,5}

Previously, hysterectomy was the definitive treatment for uncontrolled hemorrhage. However, uterine artery embolization (UAE) has emerged as the preferred fertility-preserving treatment with excellent success rates. We present a rare case of acquired uterine AVM presenting as delayed post-abortion hemorrhage successfully treated with bilateral UAE.

CASE REPORT

A 28-year-old woman, gravida 4 para 2 living 2 abortion 1, presented to the emergency department with mild vaginal bleeding of one week duration associated with passage of clots.

She had undergone suction evacuation for a missed abortion at 12 weeks of gestation at another healthcare facility and after that she had no bleeding for 1 month then she suddenly start having spotting per vaginally.

On examination, the patient was conscious, alert, and hemodynamically stable. However, she had significant vaginal bleeding. Laboratory investigations revealed hemoglobin of 9 g/dl and serum β -hCG level of 73.72 mIU/ml.

Table 1. Clinical profile of the patient.

Parameter	Findings
Age	28 years
Gravida/Parity	G4P2L2A1
Previous procedure	Suction evacuation for missed abortion
Interval	1 month
Presenting complaint	Heavy vaginal bleeding
Hemoglobin	9 g/dl
β -hCG	73.72 mIU/ml

Pelvic ultrasonography demonstrated heterogeneous thickening of the endometrium with retained intrauterine tissue.

Colour Doppler examination revealed multiple irregular anechoic vascular channels measuring approximately 4.1×3.8×2.9 cm within the posterior myometrium, extending towards the right adnexa. Spectral Doppler showed low-resistance, high-velocity turbulent flow, highly suggestive of uterine AVM.

CT angiography of the pelvis confirmed an acquired uterine AVM supplied predominantly by branches of the uterine artery without evidence of extrauterine extension.

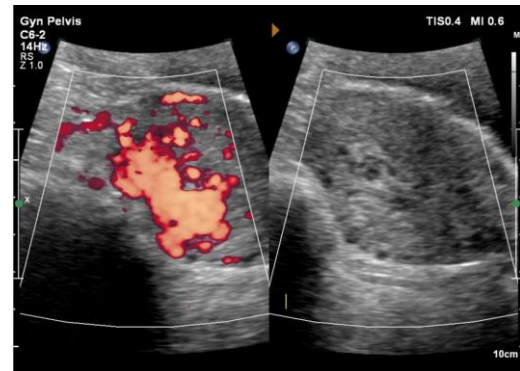


Figure 1: Transvaginal grayscale and color Doppler ultrasound showing heterogeneous endometrium with multiple serpiginous vascular channels within the posterior myometrium

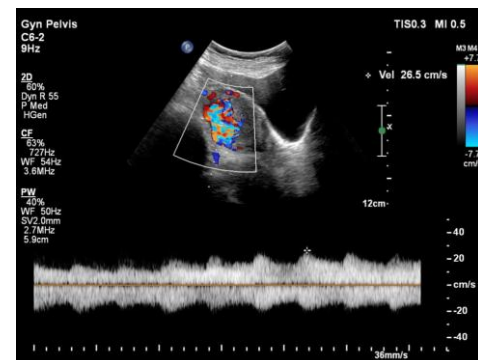


Figure 2: Spectral Doppler demonstrating low-resistance, high turbulent blood flow characteristic of uterine arteriovenous malformation.

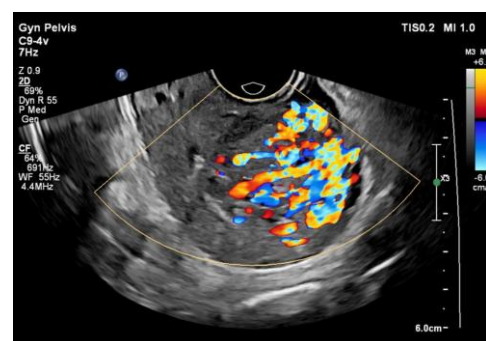


Figure 3: Color Doppler image after diagnosis demonstrating extensive myometrial vascularity adjacent to retained products of conception.

Considering the risk of severe hemorrhage during curettage, the patient was initially managed conservatively and stabilization with IV fluids and antibiotics were done and blood investigations were sent. She subsequently

underwent bilateral uterine artery embolization performed by the interventional radiology team using foam gel particles. The procedure resulted in devascularization and immediate cessation of vaginal bleeding.

After that ultrasound-guided dilation and curettage was performed the following day to remove retained products of conception. The procedure was uneventful with minimal blood loss

Table 2: Imaging findings and management

Investigation	Findings
Transvaginal ultrasound	Heterogeneous endometrium with retained products
Color Doppler	Multiple tortuous vascular channels with high-velocity turbulent flow
CT angiography	Acquired uterine AVM involving uterine artery branches
Treatment	Bilateral uterine artery embolization followed by D&C
Outcome	Complete cessation of bleeding; discharged on day 4

The postoperative period was uneventful, vaginal bleeding resolved completely, and the patient remained hemodynamically stable. She was discharged on the fourth postoperative day with advice regarding outpatient follow-up and future fertility counselling.

DISCUSSION

Acquired uterine AVMs are increasingly recognized due to widespread use of high-resolution Doppler ultrasonography. Most lesions develop after uterine trauma including abortion, dilation and curettage, caesarean section, myomectomy, or trophoblastic disease. Endometrial injury results in abnormal healing with direct arteriovenous fistulous communication within the myometrium.^{1,2}

The hallmark clinical feature is recurrent heavy vaginal bleeding, often occurring weeks after pregnancy termination or uterine instrumentation. Because retained products of conception produce similar symptoms and may coexist with AVM, distinguishing between these conditions is essential. Blind curettage without prior diagnosis may precipitate life-threatening hemorrhage.³

Color Doppler ultrasonography remains the first-line investigation because it is non-invasive, widely available, and highly sensitive. Typical findings include multiple serpiginous anechoic spaces with multidirectional turbulent flow, increased peak systolic velocity, and low-resistance indices. CT angiography further defines vascular anatomy and assists treatment planning, whereas digital subtraction angiography remains the diagnostic gold standard and permits simultaneous therapeutic embolization.^{1,3} With the increasing use of ultrasound and

Doppler for detection, uterine AVMs may be over diagnosed. Therefore, it has been proposed that lesions detected with hypervascular and turbulent flow be designated as uterine vascular malformations.³

Management depends on hemodynamic stability, reproductive wishes, and severity of bleeding. Conservative management may be considered in selected asymptomatic women. Historically, hysterectomy was performed in patients with uncontrollable hemorrhage. However, uterine artery embolization has become the preferred treatment because it offers rapid hemostasis, high clinical success, minimal morbidity, shorter hospital stay, and preservation of reproductive potential. Published success rates exceed 90%, with many women subsequently achieving successful pregnancies.^{2,4}

There are case reports of successful medical management of uterine AVM. Woman with acquired uterine AVM was given a course of combined oral contraceptive pill and there was complete cessation of bleeding in few days and computed tomography (CT) scan was performed and no abnormal vasculature was seen.⁵ Various other medications which have been considered in the treatment are danazol, progesterone, implanon, and methotrexate.⁶

In the present case, Doppler ultrasound enabled early diagnosis before repeat curettage. Bilateral UAE effectively controlled hemorrhage and permitted safe removal of retained products of conception without excessive blood loss. The favourable outcome emphasizes the importance of multidisciplinary collaboration between obstetricians, radiologists, and interventional radiologists.

CONCLUSION

Acquired uterine arteriovenous malformation following uterine evacuation is a rare but potentially life-threatening cause of secondary post-abortion hemorrhage and should be considered in women presenting with persistent or profuse vaginal bleeding after uterine instrumentation. Colour Doppler ultrasonography is an important initial diagnostic modality, while CT angiography can help delineate the vascular anatomy and guide treatment planning. In patients with significant bleeding and a high-flow AVM, uterine artery embolization provides a safe, effective, fertility-preserving method of hemorrhage control with excellent clinical outcomes. Once adequate devascularization has been confirmed, carefully performed ultrasound-guided evacuation of retained products can be undertaken safely when indicated. This case highlights the importance of accurate diagnosis, avoidance of blind repeat curettage before excluding an AVM, and a multidisciplinary approach involving obstetricians, radiologists, and interventional radiologists to achieve effective hemorrhage control while preserving future fertility.

Thus, a clear understanding of the disease and proper use of diagnostics modalities is very important in diagnosis of such cases.

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