

# Critical postpartum bleeding caused by an acquired uterine arteriovenous malformation: A Case Report

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## ABSTRACT

**Introduction:** Postpartum uterine bleeding is a common occurrence in the field of Obstetrics and varies in severity from harmless to life-threatening. The majority of the cases are due to atony, retained tissue or lesions in the birth canal, making up more than 99% of the cases. However, rare causes, such as structural abnormalities and coagulopathies, are important to keep in mind during diagnostics, when the common causes of postpartum bleeding are ruled out, particularly when the symptoms present in an unconventional manner.

**Methods:** A case report of a healthy woman presenting with acute life-threatening postpartum bleeding due to an acquired arteriovenous malformation of the uterus.

**Results:** A 43-year-old healthy woman presented with acute life-threatening gynecological bleeding 16 days after acute caesarean section. Ultrasound raised the suspicion of arteriovenous malformation.

However, due to uncertainty of the diagnosis no initial treatment was performed until the patient presented with heavy bleeding once more, resulting in a life-saving hysterectomy.

**Conclusion:** Arteriovenous malformation is an important diagnosis to consider, as early and effective diagnostics brings the opportunity for a safe and fertility-preserving treatment in the form of radiological coiling embolization. Advances in ultrasound skills of clinicians has made fast and bedside diagnostics possible, therefore the number of hysterectomies should decrease in favor of fertility-preserving treatment.

**Keywords:** Arteriovenous malformation; delayed postpartum hemorrhage

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## INTRODUCTION

**A**rteriovenous malformations are abnormally formed networks in the circulatory system, with a direct transition from artery to vein, bypassing the capillary network. This configuration results in fragile vessels susceptible to rupture. While primarily recognized in neurology, arteriovenous malformations can occur in various types of tissues throughout the body.

Uterine arteriovenous malformations are a rare cause of acute life-threatening gynecological bleeding and can be either congenital or acquired in trauma or surgery (1).

The gold standard for treatment consists primarily of coiling embolization, which is fertility-preserving and has a success rate of approximately 90% (1). Hysterectomy is the definitive alternative, although at greater cost to the patient, in terms of potential complications and loss of fertility (2).

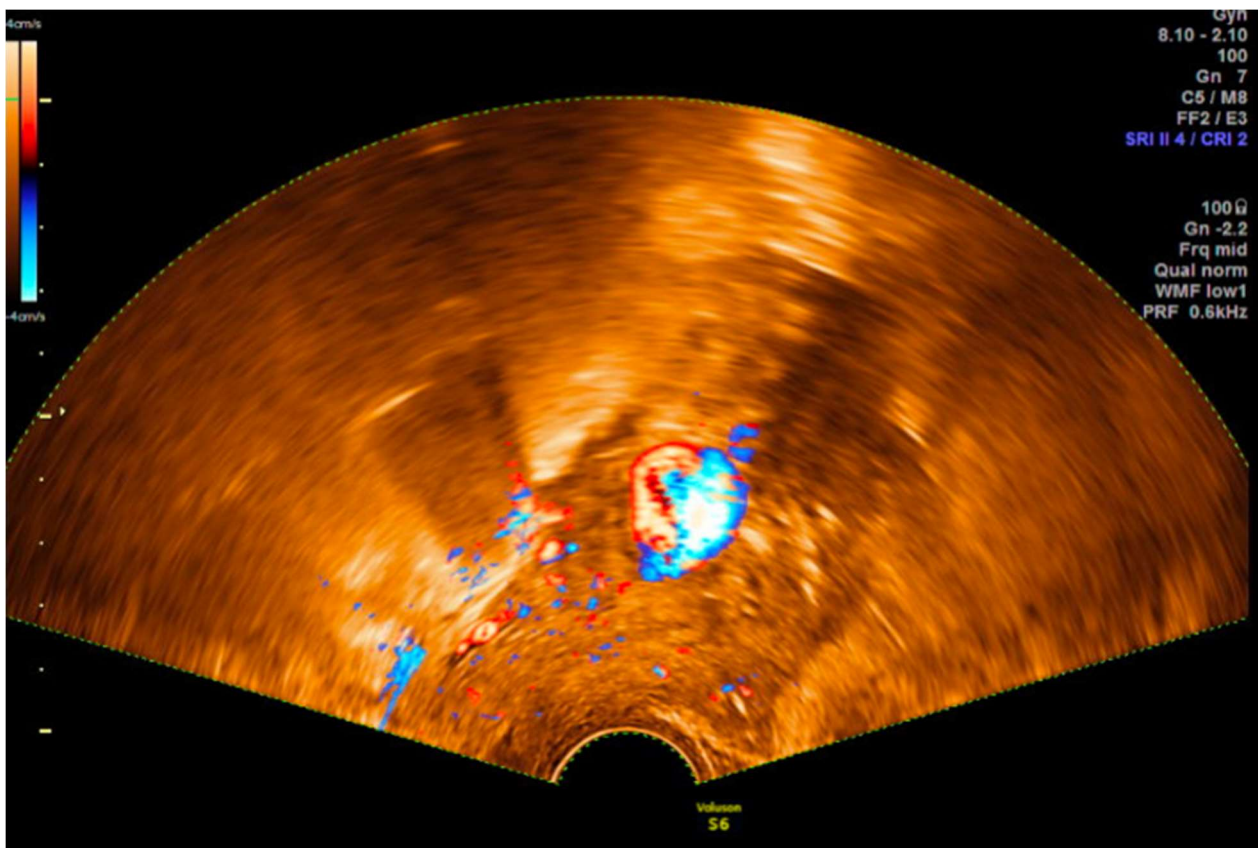
The following is a case of severe uterine bleeding during cesarean section, followed by critical vaginal bleeding in the postpartum period caused by

an arteriovenous malformation in a healthy young woman.

## CASE REPORT

**A** 43-year-old woman arrived at the maternity ward to give birth to her second child. She had no previous medical history apart from a previous acute caesarean section due to labour dystocia at the birth of her first child two years earlier. Both pregnancies were achieved through egg-donation.

This time her labour lacked progression and ended in acute caesarean section due to fetal distress visualized by pathological fetal cardiotocography. The child was delivered without sequelae and healthy. However, due to initial bleeding from the uterus, standard medical treatment for hemorrhaging was administered. During the suturing of the uterus, it was assessed that the bleeding originated from the posterior wall at the lower segment of the uterus although no abnormalities were found. The uterotomy was sutured and was checked thoroughly before suturing the



**Figure 1:** Ultrasound image with Doppler-flow representing the AV-malformation

fascia and skin. However, when the sterile cover was removed, large amounts of vaginal bleeding was observed. The uterus was compressed, and pools of fresh blood poured from the vagina. At this point, the bleeding was estimated at 4.5 L. The team attempted vaginal insertion of a Bakri balloon, but without success because of heavy bleeding. An abdominal ultrasound scan visualized an empty cavity and the team then decided to reoperate the patient. Small amounts of blood were found in the abdomen, but when the uterotomy was reopened, a pulsating artery from the right corner of the uterotomy was observed. The artery was ligated and the bleeding stopped. The patient was then sutured and transferred to the intensive care unit. During the procedure the team of anesthesiologists kept her stable with emergency blood components and vasoconstrictors. The total estimated blood loss was 7 liters. The patient recovered and 4 days later discharged in good health with a stable hemoglobin.

16 days after discharge, the patient called the emergency department, due to sudden, heavy vaginal bleeding. The ambulance staff estimated approximately 1 liter of bleeding at home. She was circulatory stable on arrival to the hospital. A transvaginal ultrasound showed a cluster of multidirectional flow in the right lower segment of the uterus, representing the same area where the bleeding was found during the cesarean section (Fig 1.) The suspicion of an arteriovenous malformation arose, promoting consultation with the nearest university hospital. Subsequently, the patient was transferred for further examination and possible embolization. They abstained from further treatment due to diagnostic uncertainties, and the patient's clinically stable condition without active bleeding. Consequently, the patient was discharged from the university hospital the same day.

Two days post-discharge, the patient contacted the emergency department again, reporting heavy vaginal bleeding. The ambulance staff estimated a bleeding of approximately 500-700 mL. This time, however, not circulatory stable, with a blood pressure of 60/40 mmHg.

CT-angiography showed bleeding from the same site as previously suspected. The patient was then

transferred back to the university hospital for further treatment, and it was attempted to place a vaginal Bakri-balloon which failed due to peruse vaginal bleeding. This led to the decision to perform an emergency hysterectomy. During the operation the team of surgeons and anesthesiologists kept the patient stable with continuous aortic compression, vasopressors and blood products. At the end of the procedure the patient had suffered an estimated 6 liters of blood loss.

The patient was further stabilized and discharged to the regional hospital and returned home in good health 6 days later.

### DISCUSSION

Uterine arteriovenous malformations are a rare but critical cause of gynecological bleeding. Especially in the postpartum period, it is an important differential diagnosis if the patient does not respond to uterotonics and retained placental tissue has been ruled out.

Only around 150 cases presented in literature (3), making image and pattern-recognition difficult. However, if ultrasound imaging reveals a large hypoechoic area in the myometrium, with multidirectional flow, uterine arteriovenous malformation should be considered. This should lead to further image diagnostics, such as CT angiography and arteriography, the latter being both diagnostic and treatment (4,5).

### CONCLUSION

Arteriovenous malformation is an important diagnosis to consider, as early and effective diagnostics brings the opportunity for a safe and fertility-preserving treatment. As advances in ultrasound skills of clinicians have made fast bedside diagnostics possible, the number of hysterectomies should decrease in favor of fertility-preserving treatment.

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