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CASE REPORT

Severe Uterine Hemorrhage Resulting from Uterine Arteriovenous Malformation: A catastrophic scenario

Nur Izzati Ayub, M.D.*,
Syed Shahrul Naz Syed Shamsuddin, M.D., MMed Emergency Medicine*,
Engku Ismail Engku-Husna, M.D., MMed Obstetrics & Gynaecology.**

** Department of Emergency and Trauma, Hospital Raja Perempuan Zainab II, Kota Bharu, Kelantan, Malaysia.*
*** Department of Obstetrics and Gynecology, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia*

ABSTRACT

Background: Abnormal uterine bleeding (AUB) is often challenging to diagnose in the emergency department (ED) due to its various causes. Uterine arteriovenous malformation (AVM) is a rare but significant gynaecological emergency that is frequently missed. It typically manifests as sudden and heavy vaginal bleeding, posing a potential life-threatening risk that requires immediate attention.

Case: A 40-year-old, para 3-0-0-3, woman presented to the ED with severe vaginal bleeding. Despite rapid resuscitation, she experienced hemodynamic instability. Uterine AVM was suspected based on colour Doppler pelvic ultrasound and later confirmed by angiography. Successful treatment was achieved with uterine artery embolization with complete resolution of the bleeding.

Conclusion: This case highlights the importance of early recognition and rapid resuscitation in treating uterine AVM with multidisciplinary team approach as a life-saving measure. Transcatheter arterial embolization is highly effective and preferred for preserving fertility in women. Timely intervention is crucial in managing this gynaecological emergency.

Keywords: uterine arteriovenous malformation, color Doppler ultrasonography, embolization, computed tomography angiography, hysterectomy.

Correspondence to: *Engku Ismail Engku-Husna, M.D., MMed Obstetrics & Gynaecology, Department of Obstetrics and Gynecology, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia. E-mail: enhusna@usm.my*

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Introduction

Uterine arteriovenous malformation (AVM) is an uncommon vascular disorder primarily seen in women of reproductive age, characterized by severe per vaginal bleeding. The rarity of this condition not only underscores its clinical complexity but also accentuates the urgency, as delayed diagnosis can lead to a critical and life-threatening state. Colour Doppler ultrasonography is readily accessible, non-invasive, and highly effective diagnostic tool. Early resuscitation and uterine artery embolization, facilitated through angiography, offer a proactive approach, particularly for women desiring fertility preservation, potentially obviating the need for conventional hysterectomy. We report a case of uterine AVM in our emergency department (ED) with massive per vaginal bleeding, emphasizing the importance of early AVM recognition and highlighting prompt resuscitation as a crucial life-saving intervention.

Case Report

A 40-year-old, para 3-0-0-3, woman presented at ED with sudden onset of heavy per vaginal bleeding, experiencing a flow heavier than her usual menstrual flow. The bleeding was accompanied by blood clots and flooding, and associated with suprapubic pain. Her previous deliveries were uneventful with normal vaginal delivery. While in the ED, she experienced another episode of escalating vaginal bleeding and started to exhibit signs of drowsiness and paleness. Her vital signs deteriorated with episodes of hypotensive and tachycardia. The estimated blood loss amounted to three liters. There was no mass palpable per abdomen, and the vaginal examination was unremarkable. Transabdominal ultrasonography revealed a blood clot at the cervix, with present of minimal free fluid in the pouch of Douglas. A urine pregnancy test was negative. Treatment included fluid resuscitation, packed cell transfusion, and the administration of intravenous tranexamic acid.

An urgent pelvic ultrasound with color Doppler (Fig. 1) revealed bulky uterus with increased vascularity and multidirectional flow with presence of prominent vessels displaying dilated vessels adjacent to the left side of the uterine fundus. These vessels appeared to be connected to the left iliac artery. A diagnosis of uterine AVM was initially suspected and later confirmed through computed tomography angiography (CTA) of the abdomen and pelvis. The CTA revealed multiple tortuous and prominent vessels within the uterus, indicating the presence of a vascular malformation (Fig. 2). Successful treatment was achieved through bilateral uterine artery embolization, effectively halting any further vaginal bleeding (Fig. 3).

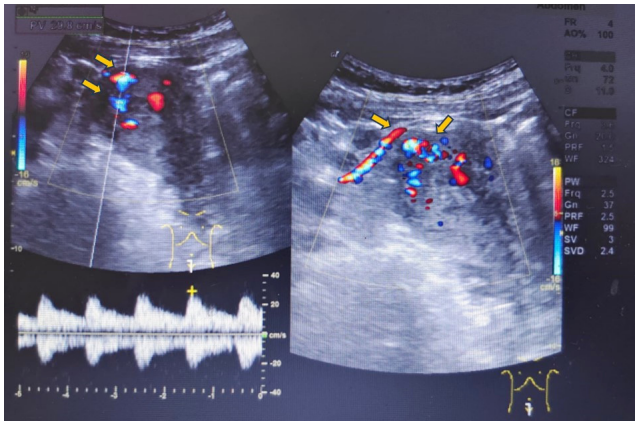

Fig. 1. An ultrasound pelvis showed increase vascularity on colour Doppler with dilated vessels that appear connected with left internal iliac artery.

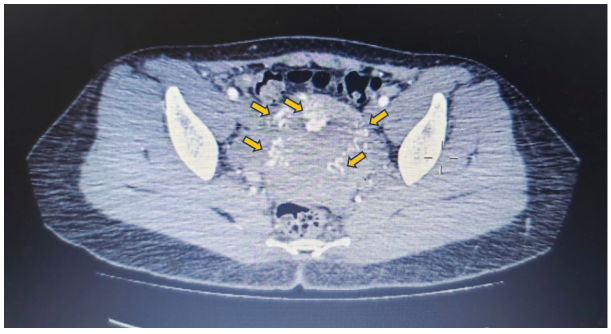

Fig. 2. A computed tomography angiography abdomen and pelvis showed multiple tortuous prominent uterus vessels represent vascular malformation.

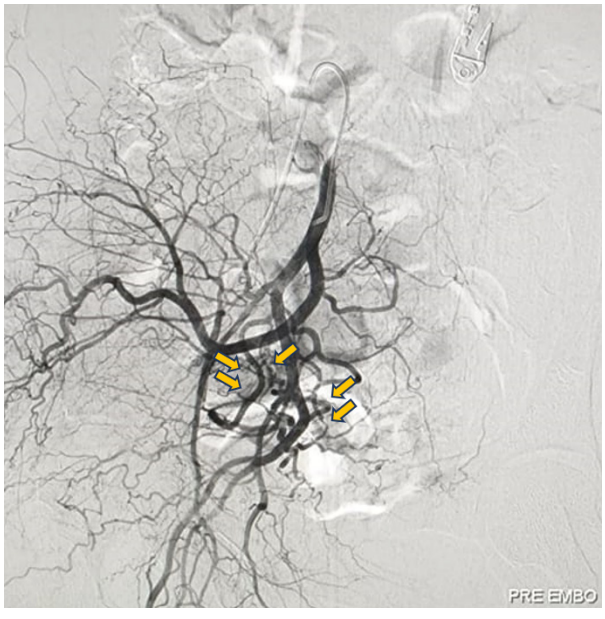

Fig. 3. Procedure of uterine artery embolization: Presence of dilated tortuous vessels arising from bilateral uterine artery suggestive of arteriovenous malformation at the uterus.

She has been discharged well post-procedure and resumed normal menstruation during regular follow-up over the past two years. This case report highlights our successful experience with a patient having this uncommon gynecological condition in our center. This case also emphasizes in the absence of widely agreed-upon guidelines for managing symptomatic uterine AVM, it is important to adopt a multidisciplinary approach with individualized management.

Discussion

Uterine AVM is a seldom encountered yet potentially life-threatening condition whenever not promptly recognized and addressed, can result severe morbidity and even mortality[1]. In a study involving 959 patients, sonographically evident uterine AVM were discovered in 5.2% of women following dilatation and curettage, and in 0.22% of women after delivery. However, only one AVM (0.1%)

within the study population was considered clinically significant[2]. A hypothesis of uterine AVM is part of the same pathological process within the spectrum of abnormal invasive placental disorders. In the context of previous trophoblastic processes, vascular malformations may resemble AVM but not in fact to be considered as true AVM[3].

In case of acute vaginal bleeding, the list of potential differential diagnoses should be routinely encompassing conditions like ectopic pregnancy, miscarriage, and uterine corpus and cervical malignancies[4]. However, ones should not disregard the possibility of rare occurrence of uterine AVM. Uterine AVM can lead to abrupt and extensive vaginal bleeding, potentially causing hemodynamic instability necessitates blood transfusion and/ or emergency hysterectomy[5]. While the common age range affected was between 20 and 40 years old, the youngest reported case of congenital uterine AVM occurred in a seven-month-old infant, necessitating a total hysterectomy due to recurrent intractable vaginal bleeding[6].

AVM can be categorized into congenital and acquired forms, with the latter being more prevalent. Congenital AVMs are very rare and are thought to arise from anomalies in the embryological development of primitive vascular systems[7]. On the other hand, acquired AVM are frequently linked to iatrogenic uterine trauma, such as dilatation and curettage or caesarean section, although they can also be associated with normal vaginal birth or malignancy[8, 9]. In this case, the patient's CTA results with absence of prior uterine trauma strongly suggest the presence of a congenital AVM, the rarer type.

Various diagnostic imaging modalities, including Doppler ultrasonography, contrast enhanced CTA, magnetic resonance imaging (MRI), and conventional angiography, can be employed for the identification of uterine AVM[10]. However, ultrasonography stands out as a preferred diagnostic method due to its attributes, eg cost-effectiveness, speed, simplicity, and non-invasiveness. As demonstrated in this case, transabdominal pelvic ultrasonography provides valuable insights into uterine abnormalities, and color Doppler imaging can unveil heightened vascularity and dilated vessels, characteristics signs of AVM.

The management of uterine AVM depends on multifactorial such as patient's hemodynamic condition, the extent of the bleeding, patient's age, and future fertility intentions[11]. Managing uterine AVM is challenging necessitate multidisciplinary approach[12]. Initial treatment focuses on stabilizing the patient's hemodynamic status and halting the bleeding. Historically, hysterectomy was the primary treatment choice. Given that uterine AVM is frequently diagnosed in women of childbearing age, angiographic embolization has rendered hysterectomy no longer the sole imperative solution[13]. In this particular case, the rapid resuscitation with initiation of fluid and blood products, and intravenous tranexamic acid played a crucial role in stabilizing the patient's hemodynamic status. Nonetheless, the definitive treatment for uterine AVM often involves the successful performance of transcatheter embolization of the anomalous vessels, uterine artery embolization effectively closed off the irregular vascular connections, resulting in the cessation of abnormal bleeding. Repeat embolization is feasible and recommended for recurrence symptomatic uterine AVM, emphasizing the importance of both clinical and imaging follow-up[14]. A systematic review analysing fertility after uterine artery embolization suggested that pregnancy rates were similar to age-adjusted rates in the general population, with similar rates of complications[15]. Medical management with either combined oral contraceptives pills or medroxyprogesterone acetate is effective in completely or partially resolving uterine AVM. Subsequent pregnancies in this population are feasible and are not at higher risk for perinatal complications[16]. Based on literature search, the scarcity of reported cases has led to the absence of universal treatment guidelines for uterine AVM. Hence, detailed discussions with multidisciplinary specialists including gynecologists, vascular surgeons, and radiologists could facilitate the

development of guidelines for the personalized management of AVM[17].

Conclusion

This case emphasizes the significant of early identification and prompt resuscitation as life-saving measures in uterine AVM treatment. Transcatheter arterial embolization stands out as a highly effective and preferred method for preserving fertility in women. In the absence of widely agreed-upon guidelines for managing symptomatic uterine AVM, it is crucial to adopt a multidisciplinary approach and provide personalized patient care.

Potential conflicts of interest

The authors declare no conflicts of interest.

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