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Uterine arteriovenous malformation: the importance of early recognition in life-threatening hemorrhage

Malformação arteriovenosa do útero: a importância do diagnóstico precoce na hemorragia severa

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Abstract

Uterine arteriovenous malformation (AVM) is a rare but serious cause of abnormal uterine bleeding, often acquired following pregnancy termination or uterine instrumentation. We report a case of a 22-year-old woman presenting with severe hemorrhage two months after a medically induced abortion. Ultrasound (US) revealed a hypervascular intrauterine lesion. Hysteroscopy excluded retained products of conception (RPOC) but identified a pulsatile mass. Computed tomography angiography (CTA) confirmed an AVM involving the left uterine artery. The patient underwent selective arterial embolization, with no recurrence of bleeding. Doppler ultrasound is essential for uterine AVM detection, while selective angiography promotes treatment planning, preventing life-threatening complications.

Keywords: Uterine arteriovenous malformation; Abnormal uterine bleeding.

Resumo

A malformação arteriovenosa (MAV) uterina é uma causa rara, mas grave, de hemorragia uterina anormal, frequentemente adquirida após aborto ou instrumentação uterina. Apresentamos o caso de uma mulher de 22 anos com hemorragia severa, dois meses após um aborto medicamente induzido. A ecografia revelou uma lesão intrauterina heterogénea muito vascularizada. A histeroscopia excluiu retenção trofoblástica, identificando uma massa pulsátil. A angiografia por tomografia computorizada (angio-TC) confirmou uma MAV envolvendo a artéria uterina esquerda. A doente foi submetida a embolização arterial seletiva, sem recorrência dos sintomas. A ecografia Doppler é essencial para o diagnóstico de MAV, enquanto a angiografia auxilia na decisão terapêutica.

Palavras-chave: Malformação arteriovenosa uterina; Hemorragia uterina anormal.

Uterine AVM results from the formation of abnormal connections between arteries and veins within the uterus, bypassing the capillary system.

Although it can be congenital, most of them are acquired, with some risk factors for the latter being pregnancy termination, multiple pregnancies and uterine surgery, like curettage.

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It is crucial to differentiate between "enhanced myometrial vascularity"(EMV), RPOC and uterine AVM, as these entities may present as hypervascular uterine lesions with turbulent flow on ultrasound[1]. Angiography plays a key role in establishing the correct diagnosis[1]. EMV is frequently associated with retained products of conception and reflects a transient hypervascular condition rather than a true arteriovenous malformation[1]. Although EMV may mimic uterine AVM on

Doppler ultrasound, digital subtraction angiography allows reliable differentiation by demonstrating early venous filling exclusively in true AVM[1]. This distinction has important therapeutic implications, as EMV is usually managed by removal of retained products of conception, with subsequent spontaneous resolution of the abnormal vascularity, whereas true uterine AVM often requires interventional treatment, such as uterine artery embolization[1,3].

On ultrasound, a nonspecific range of appearances may be observed, including areas of myometrial heterogeneity and intramural or endometrial regions with small tubular structures or a spongy pattern[2]. Color Doppler US typically shows a multidirectional vascular network with a low resistance (RI 0.2-0.5) and a high-velocity flow pattern (PSV 25-110 cm/s)[3].

A broad spectrum of clinical presentations may appear, ranging from an incidental finding in an asymptomatic patient to abnormal uterine bleeding, which can be life-threatening. Hemorrhage presumably occurs when the vessels protrude into the uterine cavity and erode, resulting in a variable amount of bleeding.

We present the case of a 22-year-old woman who arrived at the emergency department with a severe uterine hemorrhage. She had undergone a medically induced second-trimester pregnancy termination two months earlier and had no other relevant medical history.

On admission, ultrasound revealed a heterogeneous and hypervascular intrauterine lesion in the uterine fundus, measuring 19 × 23 × 25 mm, with the endometrial-myometrial junction being poorly defined. Laboratory tests showed a hemoglobin level of 9.2 g/dL. Consequently, the patient was admitted for hemorrhage control and further evaluation.

A hysteroscopy was performed to exclude trophoblastic retention, revealing a large, pulsatile mass occupying the entire posterior uterine wall. To further characterize the anomaly, CTA was conducted, confirming a uterine AVM supplied by the left uterine artery.

The patient was then transferred to a tertiary care center with interventional radiology and a selective embolization of the left uterine artery's afferent branch was performed. The procedure was uneventful, with no recurrence of bleeding. After one month, the patient remained asymptomatic, and ultrasound showed a linear,

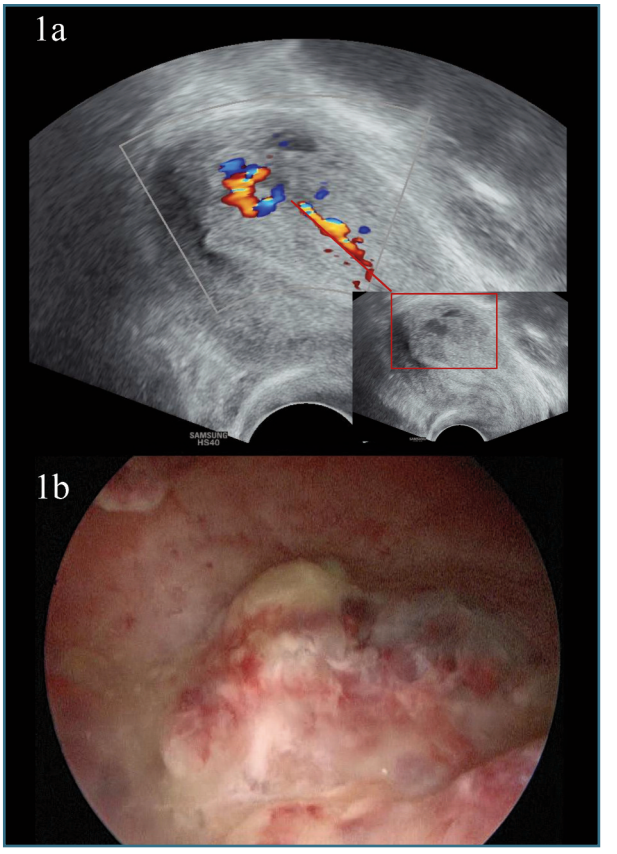

FIGURE 1a. 2D ultrasound with and without Doppler at admission revealing a uterine arteriovenous malformation; **1a.** Hysteroscopic image of the large pulsatile mass occupying the entire posterior uterine wall.

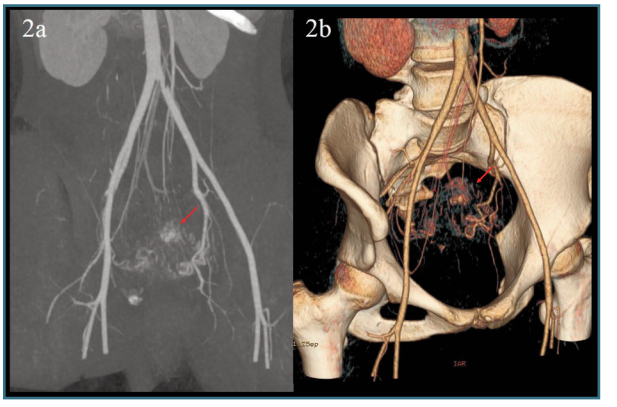

FIGURE 2a. Computed tomography angiography showing an AVM supplied by the left uterine artery (red arrow); **2b.** 3D Computed tomography angiography showing an AVM supplied by the left uterine artery (red arrow).

homogeneous endometrium with no signs of abnormal vascularization.

Although its exact prevalence is still unknown, uterine AVM is a rare but serious cause of abnormal uterine bleeding. In this type of clinical setting, it is important to keep in mind this entity so that adequate management can be offered. Some interventions used to control bleeding, such as curettage, may precipitate massive hemorrhage and even fatal outcomes[3]. Since RPOC is one of the differential diagnoses, it is crucial to identify the underlying condition accurately. Ultrasound with Doppler is typically the first-line imaging study, but can be complemented with angiography for further clarification when this condition is suspected.

The therapeutic approach includes conservative management with combined hormonal contraception, uterine artery embolization or hysterectomy. Given the lack of consensus on the superiority of one treatment over another, each case must be evaluated individually, considering hemodynamic stability, symptom's severity, and patient's reproductive desire[3].

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AUTHOR'S CONTRIBUTION

MO – wrote and reviewed the manuscript. RD and MM – reviewed the manuscript.

CONFLICTS OF INTEREST

There are no conflicts of interest.

PATIENT CONSENT

Informed consent was obtained.

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