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Case Report

Uterine arteriovenous malformation: A rare cause of abnormal uterine bleeding in a post-menopausal female

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ARTICLE INFO

Article history:

Received 12 April 2016

Accepted 25 August 2016

Available online 27 October 2016

Keywords:

Arteriovenous malformations

Doppler

Angiography

Percutaneous embolisation

Hysteroscopy

Introduction

Arteriovenous malformations are abnormal communications between arteries and veins in a tissue without the presence of an intervening capillary network.¹ Very little is known about uterine arteriovenous malformations (AVMs), which are a rare vascular entity. Classically, these present as sudden, intermittent and massive uterine bleeding, which may even be life threatening.¹ Though the exact incidence of uterine AVMs is unknown,² advances in imaging techniques such as Doppler sonography, multiple detector computed tomography (MDCT) and magnetic resonance imaging (MRI) have increased their detection rates.

Case report

A 75-year-old post-menopausal, hypertensive female patient presented to the emergency department of our hospital with abnormal uterine bleeding. Her obstetric and gynaecological history was unremarkable. General examination and laboratory investigations were essentially normal. Her pelvic examination showed bulky uterus with no obvious adnexal abnormality. Ultrasonogram (USG) pelvis revealed enlarged uterus with multiple fibroids. Multiple dilated tortuous vessels were seen in the Lt adnexa with mosaic colour flow (Fig. 1) and a high velocity arterial waveform (Fig. 2). A prominent dilated vessel was seen in Rt adnexa, which showed low resistance mixed flow pattern. Contrast-enhanced computed tomography (CECT) pelvis showed bulky uterus with a tortuous tangle of blood vessels in the parametrium and posterior uterine wall showing early arterial enhancement (Fig. 3). Arterial feeders were seen rising from Lt uterine artery with an early opacification and dilatation of the Rt internal iliac vein and inferior vena cava (IVC) (Fig. 4). MRI showed multiple fibroids, a well-defined heterogenous signal intensity lesion in posterior wall with multiple flow voids and blood-filled uterine cavity. Multiple tortuous vessels were seen in the parametrium with dilated Rt internal iliac vein. Based on the imaging findings, a provisional diagnosis of uterine AVM was made.

The patient was re-admitted 1 week later with severe vaginal bleeding, BP of 90/60 mmHg and haemoglobin 7 mg/dl at presentation. After initial stabilisation with IV fluids and blood transfusion, she was planned for hysteroscopy and

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<http://dx.doi.org/10.1016/j.mjafi.2016.08.011>

0377-1237/© 2016 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

Fig. 1 – (a and b) Colour Doppler image of uterus and Lt adnexa: a well-defined hypoechoic fibroid is seen in the uterine body and a tangle of blood vessels is seen in the Lt adnexal region with mosaic colour flow pattern.

Fig. 2 – Spectral trace of the Lt adnexal vessels showing high velocity arterial flow within.

pelvic venography. Hysteroscopy could not be performed as her uterine cavity was full of blood clots and, in view of her status, an urgent surgery was performed. Per-op findings showed multiple fibroids, dilated vessels in Lt adnexa and large aneurysmal vessels in Rt broad ligament above Rt uterine pedicle draining into IVC. A TAH + BSO was performed after carefully dissecting and isolating the vessels. Uterine pedicle and large aneurysmal vessels were cut and ligated individually. Histology showed multiple degenerating fibroids and a focal lesion in the posterior wall of myometrium containing

multiple dilated, congested thick-walled vessels of varying calibre extending to the serosa suggestive of AVM. Post-op period was uneventful and the patient recovered completely. Follow-up after 6 months was advised.

Discussion

Abnormal uterine bleeding (AUB) is the most common condition with which women present to the emergency department. Uterine AVM, a rare cause of AUB with unknown incidence, mostly occurs in women of child-bearing age.³ However, there have been few case reports in literature where they have been detected in women till 72 years of age. Uterine AVMs are abnormal communications between intramural arteries and myometrial venous plexuses, which pathologically appear as a vascular tangle comprising of arterial feeders, central nidus and enlarged draining veins.¹ These are of two types – congenital and acquired.⁴ Defective embryological development of primitive vessels is implicated in development of congenital variety, which itself is extremely rare.⁴ Acquired uterine AVMs on the other hand are mostly of traumatic origin and are usually seen in women with previous history of uterine or pelvic surgery such as C-section or myomectomy, dilatation and curettage. Less common causes are pelvic inflammatory disease, uterine or cervical malignancy, gestational trophoblastic disease and diethyl stilbestrol exposure.⁵

Bleeding in AVMs is the result of exposure of abnormal blood vessels due to physiological sloughing of the endometrium

Fig. 3 – CECT pelvis in early arterial phase: (a) axial image and (b) reformatted coronal image. Enhancing tortuous blood vessels are seen in the parametrium with early opacification of Rt internal iliac vein and IVC. Rt internal iliac vein is dilated.

Fig. 4 – CECT coronal VR image: tangled mass of abnormal vessels is seen in the pelvic region with arterial feeders arising from the Lt uterine artery and drainage into dilated Rt internal iliac vein and subsequently the IVC.

during menstruation or trauma caused by instrumentation.^{1,6} Other presentations are menorrhagia, metrorrhagia, severe anaemia secondary to continuous blood loss, recurrent spontaneous abortions, lower abdominal discomfort or pain and rarely dyspareunia.⁶ Rarely very large AVM's can present as pulsatile pelvic mass and may cause cardiac decompensation due to large arteriovenous shunting of blood.

In the past, hysterectomy and histopathology were the only means available for diagnosing these AVMs.^{7,8} With the availability of colour Doppler USG and multi-detector CT scans, detection of this rare entity has been on the rise. Though conventional angiography is the imaging modality of choice, it is an invasive technique and is reserved only for patients planned for percutaneous embolisation procedures.¹⁰

Ultrasonography with its ease of availability and portability is usually the first imaging modality employed for evaluating patients of AUB. Addition of colour Doppler technique has improved its ability to detect AVMs tremendously.^{9,10} It is also helpful to assess the effectiveness of embolisation procedures on follow-up. However, this technique is still limited in its capability to adequately determine the exact extent of the lesion.¹⁰ Multiphase image acquisition in MDCT and newer, fast imaging protocols in MRI have also helped to detect the presence and determine the exact extent of AVMs non-invasively. These also help to identify the presence of other pathologies that may be implicated as a cause of AUB.¹⁰

Treatment of uterine AVM remains a dilemma. Treatment option is guided by the patient's clinical status and need for preservation of fertility. Conservative approach is usually adopted for asymptomatic patients or those with minimal symptoms. In a symptomatic patient with severe bleeding, if further child bearing is not desired, the definitive treatment is hysterectomy with ligation of the abnormal vessels.⁹ The recent trend is selective angiographic embolisation of the AVM with temporary or permanent embolising agents.¹¹ This minimally invasive technique is associated with lower mortality rates even in patients at a high risk for surgery. Embolisation is being preferred in cases where fertility needs to be preserved.

Conclusion

Uterine AVM is a rare entity that may cause severe life-threatening uterine bleeding and should always be considered in the list of differentials of AUB. Imaging helps in its early detection and timely treatment can be life saving.

Conflicts of interest

The authors have none to declare.

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