

Acquired AVM after uterine curettage: Reviewed literature

Poonam Kashyap, Ashok Kumar, Latika Sahu, Chetna Sethi

ABSTRACT

Uterine arteriovenous malformations (AVMs) are conditions which can lead to life-threatening hemorrhages. These are abnormal connections between arteries and veins, either from birth or develop after trauma. These are commonly associated with prior pregnancy and can be confused with retained products of conception. We present two cases of acquired uterine AVM with prior history of curettage done for incomplete abortion and presented with heavy vaginal bleeding. A 32-year-old lady with history of previous two caesarean section and two dilatation and curettage was referred with complaints of intermittent heavy vaginal bleeding and suspicion of AVM on Doppler study. She was diagnosed with uterine AVM by transvaginal color Doppler ultrasonography and three-dimensional computed tomography (3D-CT) angiography which demonstrated hypervascular bundles of uterine vessels, dilated draining veins, and feeding arteries. The dynamic magnetic resonance angiography (MRA) revealed early filling of the internal iliac vein and the inferior vena cava, indicating massive arteriovenous shunting in the uterus. The patient was treated with transcatheter bilateral uterine artery embolization and after the procedure, it was confirmed that the shunting of blood was reduced. The patient had resumed normal menstrual cycles after the procedure and remained fine

in follow-up. In another case, a 30-year-old lady was presented with irregular heavy vaginal bleeding, with previous two vaginal deliveries and history of curettage for incomplete abortion. She was diagnosed with uterine AVM with Doppler imaging and with CT angiography of pelvis. She was treated with transcatheter uterine artery embolization.

Keywords: Arteriovenous malformation, Magnetic resonance angiography, Transcatheter uterine artery embolization

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INTRODUCTION

Although uterine vascular malformation is a rare cause of uterine bleeding but this condition should be suspected when the patient presents with heavy vaginal bleeding after pregnancy especially when there is history of trauma to uterus either in the form of surgery or instrumentation. Arteriovenous malformations are a cause of intraperitoneal and vaginal hemorrhages in 1–2% of cases. The true incidence of this rare condition is not known but >100 cases have been noted in the literature till now. First described by Dubreil and Loubat, it is seen in women aged 18–72 years but rarely in nulliparous women [1]. The patient typically presents with intermittent heavy vaginal bleeding for weeks or months. The suspicion becomes more strong when bleeding occurs after pregnancy and there is history of trauma either in the form of curettage or previous uterine surgery. Ultrasonography with Doppler imaging is the

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modality to diagnose this condition. In ultrasonography, this condition may be confused with retained products of conception and gestational trophoblastic disease as echogenic material can be seen in endometrium but on Doppler study, hypoechoic areas in myometrium with high velocity vascular flow vessels is characteristic of AVM [2, 3]. Recent terminology used for uterine AVMs is enhanced myometrial vascularity [2, 3].

We present two cases of uterine AVM after uterine curettage which was confirmed on CT angiography and MRA with dynamic contrast enhanced sequences and treated with bilateral uterine artery embolization.

CASE SERIES

Case 1

A 32-year-old lady, multipara presented with complaints of intermittent heavy vaginal bleeding for five months. She had two deliveries by caesarean section and dilatation curettage done twice in view of retained products of conception. The patient had amenorrhoea of six weeks and pregnancy was confirmed by her urine pregnancy test which was positive. She had taken medical abortion for aborting the pregnancy. After 15 days, she got ultrasound done which showed retained products of conception and she had undergone dilation and curettage twice in view of retained products of conception. Irregular vaginal bleeding continued after the procedure of dilation and curettage. She was referred to higher center with the suspicion of AVM on Doppler imaging. Patient presented with intermittent heavy vaginal bleeding. On clinical examination, her vitals were stable. She was severely anemic. On per abdomen examination, no lump was palpable. On per speculum examination, bleeding was seen through cervical os. As per her vaginal examination, cervix pointing posteriorly with os closed, uterus was enlarged to six weeks size, firm and regular. Her investigations were done, hemoglobin was 6g% and beta human chorionic gonadotropin (HCG) was in normal range.

On transvaginal ultrasonography (TVS), there was a heterogenous mass in anterior myometrium in lower body of uterus, endometrial thickness was 6 mm and was normal (Figure 1).

On Doppler imaging, multiple high velocity, low impedance vessels were seen in myometrium forming a mosaic (Figure 2).

A contrast enhanced magnetic resonance imaging (MRI) showed mass in anterior myometrium of size $5.5 \times 3.5 \times 2.5$ cm with focal heterogenous intensity and multiple flow-related signal voids within the lesion (Figure 3).

On dynamic contrast enhanced sequences in MRA, there is rapid clearing of contrast seen in subsequent films suggesting arteriovenous shunt in uterus (Figure 4).

On CT angiography, the hypervascularity of the mass was noted. The feeding vessels were arising from the right

uterine artery and some from left uterine artery were found (Figure 5).

The patient was treated with transcatheter bilateral uterine artery embolization with steel coils (Figure 6). After the procedure, the patient was being followed for one year and she had regular menstrual cycles with normal flow.

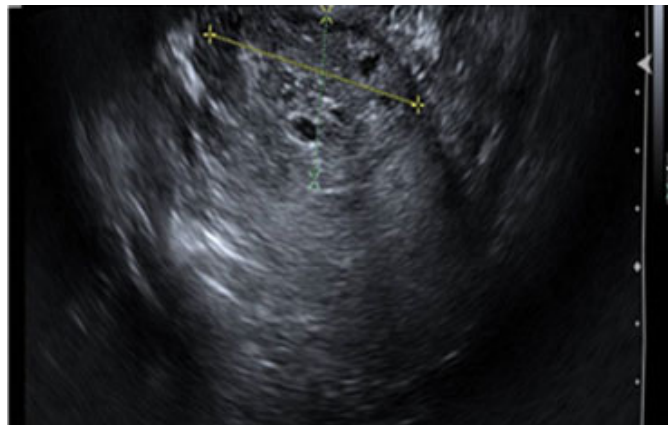


Figure 1: Transvaginal scan showing large heterogenous mass noted in the anterior myometrium in the body (more towards right side) measuring $6.5 \times 5 \times 2.8$ cm in size indenting the endometrial cavity.

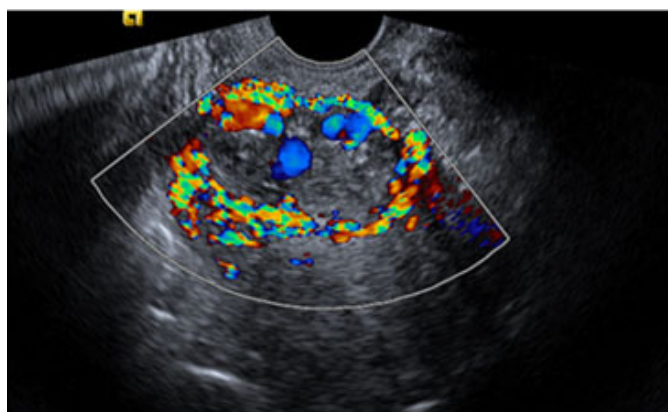


Figure 2: Doppler imaging showing hypervascularity, multidirectional, high velocity flow, and color mosaic pattern in the mass inside the myometrium.

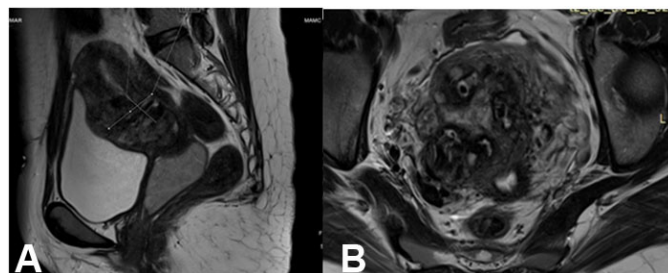


Figure 3: T2 weighted sagittal (A) and coronal (B) images demonstrating heterogeneous signal intensity mass with flow voids in the antero-inferior wall of uterus causing distortion of endometrial cavity with multiple foci of blooming on axial T2* images (C).

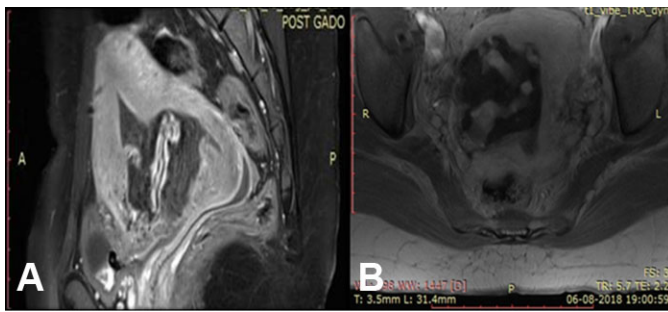


Figure 4: T1 axial image (A) of dynamic contrast enhanced (DCE) sequence shows early opacification of bilateral internal iliac veins and (B) early wash out of contrast.

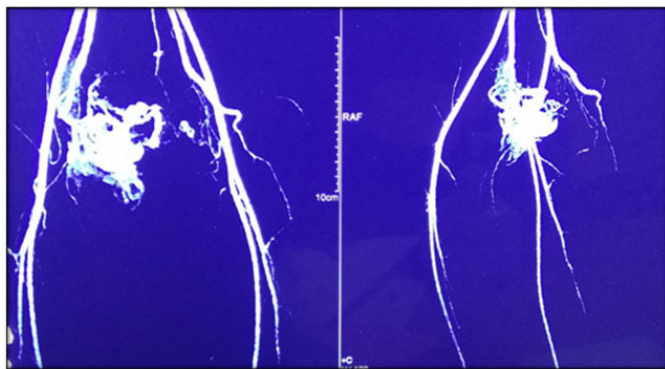


Figure 5: CT angiography of pelvis showing a tuft of vessels with abnormal communication among vessels arising from right uterine artery.

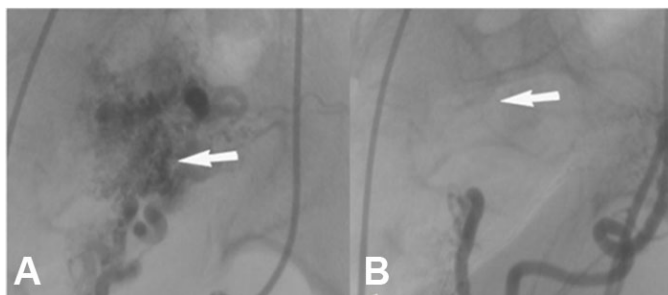


Figure 6: (A) Pre-embolization and (B) Post-embolization.

Case 2

In this case, a 30-year-old lady with previous two vaginal deliveries and history of curettage for incomplete abortion was presented with irregular heavy vaginal bleeding for three months. There was history of curettage for incomplete abortion five months back. She was diagnosed with uterine AVM with Doppler imaging and with CT angiography of pelvis. The patient was treated with transcatheter uterine artery embolization. She had restored normal menstrual function after the procedure and is doing fine in follow-up.

DISCUSSION

Uterine AVMs are rare cause of vaginal and intraperitoneal hemorrhages. O'Brien et al. identified

uterine AVMs in 21 women out of 464 pelvic sonographic examinations for uterine bleeding, and found out the incidence of approximately 4.5% [4]. There is proliferation of arterial and venous channels with fistula formation and mixture of capillary-like vessels in AVM. Increased intraluminal pressure causes secondary intimal thickening in the veins making distinction between arteries and veins difficult.

This condition can be congenital or acquired. There is abnormality in the embryological development of primitive vascular structures which result in multiple abnormal communications between arteries and veins resulting in congenital AVM. Congenital AVM also has multiple vascular channels which invade the surrounding structures [5] and prominent parametrial vessels are seen on imaging. While acquired cases are caused due to trauma either in the form of curettage, uterine surgery, uterine trauma, endometrial carcinoma, cervical carcinoma, gestational trophoblastic disease [6].

It is proposed that during this trauma venous sinuses become incorporated in scars within the myometrium after necrosis of the chorionic villi leading to AVMs [7]. The treatment depends on the degree of uterine bleeding and hemodynamic instability of the patient.

Arteriovenous malformation should always be suspected when the patient presents with intermittent heavy vaginal bleeding in the postpartum period or after abortion especially when there is history of trauma, any surgery or of instrumentation. The suspicion is raised further if we find a bulky pulsatile uterus, abnormally dilated vessels in the vagina, or pulsation palpable in the adnexal area in a patient with normal uterine curetting and normal hysteroscopy findings. The gold standard for diagnosis of uterine AVMs is digital subtraction pelvic angiograph [8]. The procedure not only serves to confirm the diagnosis but also allows identification of the main feeding vessels if embolization is being considered as a treatment [9].

Various treatment modalities are available from medical to surgical depending on the clinical profile of the patient. Medical modalities like estrogens, progestins, methylergometrine, danazol and 15-methyl PGF_{2α} are tried and hysterectomy was also used in case of massive bleeding not controlled with medical management [10]. But in recent times transcatheter arterial embolization is good modality of treatment and should be the first choice of treatment in all women. Some people use danazol for few weeks or months prior to going for embolization. The additional advantage is that embolization can also be used in actively bleeding patient and it is fertility sparing treatment. After embolization, menstrual function and fertility is restored in majority of women. If there is failure of embolization therapy, if no desire to preserve fertility or no possibility of follow-up, then hysterectomy can be done as a last resort [11].

In our first case, the patient had severe bleeding and developed severe anemia because of massive blood loss. There was delay in diagnosis as the patient was wrongly

treated with repeated curettage. She was treated with transcatheter arterial embolization after stabilizing her condition. She responded very well and had no complaints in the follow-up. Strict follow-up is required in such cases as there may be reactivation of these channels. If it happens then immediate and appropriate measures should be taken.

In our second case, there was history of uterine curettage done for complete abortion. She was managed with transcatheter uterine artery embolization.

CONCLUSION

Uterine AVM can often be missed as the presentation may be similar to gestational trophoblastic diseases, retained products of conception or postpartum hemorrhage. This entity should always be suspected when the patient presents with intermittent heavy vaginal bleeding in the postpartum period or after abortion especially when there is history of trauma, any surgery or of instrumentation. Strong suspicion can lead to early diagnosis of this life-threatening condition and can decrease the morbidity and mortality of women. The treatment by transcatheter uterine artery embolization is simple and effective method. This method helps to reduce the morbidity associated with surgery and also to preserve fertility.

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Author Contributions

Poonam Kashyap – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Ashok Kumar – Conception of the work, Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Latika Sahu – Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Chetna Sethi – Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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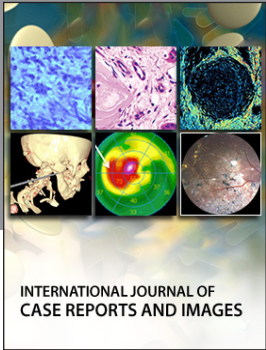
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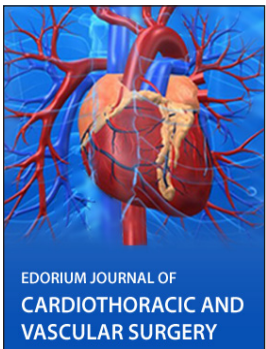
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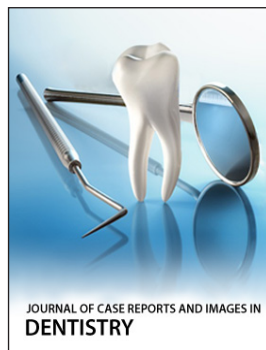
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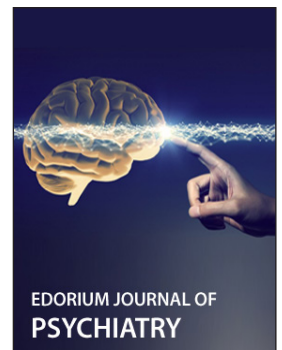
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