

EMBOLIZATION OF UTERINE ARTERIOVENOUS MALFORMATION WITH SUCCESSFUL POST PROCEDURE PREGNANCY

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ABSTRACT

We present a case of 22 years old female who presented with irregular PV bleeding and menorrhagia for 6 months and was diagnosed as uterine AVM by coloured Doppler, MRI and CTA. Embolization of uterine AVM was then decided and she received successful super selective TAE with lipiodol and coils (micro coils and tornado coils). There were no complications during and after the procedure. The patient conceived spontaneously after the procedure and delivered a healthy baby later on.

Introduction

Uterine arteriovenous malformation (AVM) is a rare cause of per vaginal (PV) bleeding due to abnormal connection between artery and vein.¹ Only 100 cases have been reported since 1926.² They are uncommon in nulliparous women and are more common in 18 to 72 years age group.³ They can be congenital or acquired.⁴ Congenital uterine AVM occur due to embryologic developmental anomaly resulting in multiple abnormal connections between arteries and veins.⁴ Acquired AVM is usually secondary to uterine trauma, surgery, endometrial and cervical carcinomas or gestational (GTD). On imaging, AVMs are seen as small abnormal communications between intramural arterial branches and venous plexus of myometrium and appear as a vascular tangle or tuft.⁵⁻⁶ The primary diagnostic modality for the suspected patients of uterine AVM is TVS or abdominal ultrasound along with colour Doppler study. A subsequent CT or MRI pelvis should be done for extent and detection of any parasitic feeding arteries.⁷

There are multiple treatment options but in the last decade Transcatheter arterial embolization (TAE) has become the treatment of choice in patients with history of abnormal PV bleeding of child bearing age or who

want to preserve their fertility. Published cases regarding term pregnancies post TAE are available now.⁸⁻¹⁵ We present a case of a patient with uterine AVM who was successfully treated with uterine artery embolization.

Case Report

A 22 years old female visited the gynaecological and obstetric outpatient department of Rehman medical institute of Peshawar with history of irregular per vaginal bleeding (PV bleeding) and menorrhagia for the last 6 months. She also had history of evacuation and curettage (ENC) for invasive mole 2 years back. Her thyroid profile, prolactin, luteinizing hormone (LH) and follicle stimulating hormone (FSH) were done which were normal. Transvaginal ultrasound (TVS-IVF) was also performed which revealed 1.5 x 1.4 cm rounded cystic structure in the myometrium of uterine fundus left side. This cystic structure was showing communication with adjacent dilated tortuous vessels. A possibility of arteriovenous malformation (AVM) was raised and beta human chorionic gonadotrophin (BHCG) was advised to exclude gestational

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trophoblastic disease (GTD), which was normal. She was then referred to our interventional radiology (IR) department for further evaluation of AVM. Her magnetic resonance imaging (MRI) pelvis was performed which showed vascular malformation in uterine fundal myometrium on left side with serosal bulge and no extension into the endometrial canal (Fig.1). Further workup with computerized tomography angiography (CTA) also confirmed uterine AVM with 2cm aneurysm in left fundal myometrium and multiple dilated vessels (Fig. 2).

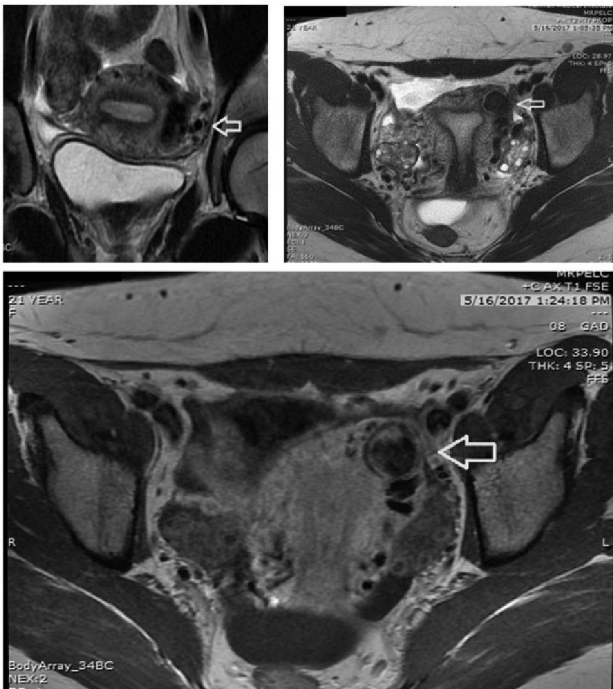


Figure 1: Multiplanar MR images reveal vascular malformation in uterine fundal myometrium on left side (arrow) with serosal bulge and no extension into the endometrial canal.

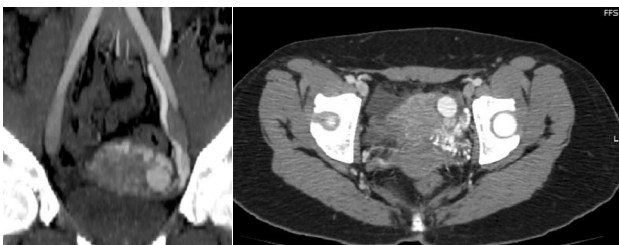


Figure 2: CT angiography images confirm AVM with dilated left ovarian vein (seen in coronal reformatted MIP-ped image). Axial image shows tortuous dilated vessels in left fundal region with aneurysm.

The case was discussed in MDT. The option of Trans catheter arterial embolization (TAE) was discussed with the patient. Informed consent was obtained and

possible complications of the procedure were discussed with the patient and the family. TAE was performed with right sided retrograde access. A large AVM fed by left uterine artery with an aneurysm was found. This was super selectively cannulated and embolized with 10 cc of lipiodol. Decrease in flow was immediately noted (Fig. 3). Due to high risk of PE, it was decided to perform further embolization 7 days after the index procedure. During the next procedure



Figure 3: Angiography images showing Uterine AVM with dilated left ovarian vein (3a). Post procedure image in (3b) showing reduced vascularity and disappearance of large dilated vessels.

no significant reduction in flow was observed and no large pocket of lipiodol. So, in the next procedure the artery was accessed just before the aneurysmal dilatation. 5 mm x 10 cm hydrogel micro coils were placed to decrease the flow in arteriovenous (AV) circuit. Lipiodol 100cc was used to embolize the AVM. A 10 mm tornado coil was placed after lipiodol embolization in the proximal uterine artery to allow lipiodol to settle and decrease systemic embolization.

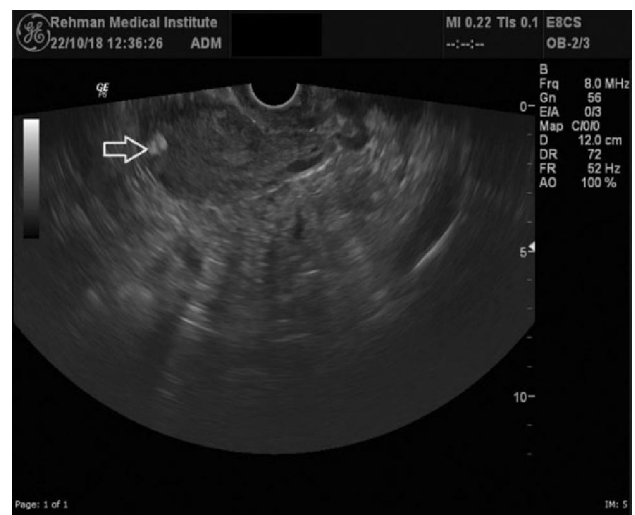


Figure 4: Ultrasound image after one year of procedure showing few residual vessels at site of previous AVM.

There were no immediate complications and the patient was discharged on antibiotics and analgesics. After 3 and a half months she conceived spontaneously without any hormonal treatment and went on to deliver a healthy baby through caesarean. Her prenatal examinations were normal and there were no post-partum complications. Her follow up ultrasound was done one year after the procedure, which showed marked improvement with few tiny residual vessels.

Discussion

Uterine AVM can present with massive PV bleeding so, it should be treated early. There is no large series available in literature on the incidence of uterine AVM. O'Brien et al. performed ultrasonography in 464 PV bleeding patients aged 18 to 41 years and reported a rough incidence of around 4.5%.⁸ Acquired AVM can be due to miscarriage, surgical abortion, dilation and curettage (DNC). They can also be related with infection, gestational trophoblastic disease, uterine or cervical malignancy and diethylstilbestrol exposure.^{9,16} AVM in our case report was most probably acquired because of patient's history (ENC for invasive mole). However, the possibility of GTD was satisfactorily ruled out by normal BHCG. Uterine AVM can result in unexpected and immense vaginal bleeding that can be dangerous. During DNC and menstruation, vessels of uterine AVM are exposed and result in uterine bleeding.⁴ They can also result in lower abdominal discomfort, urinary frequency or incontinence, dyspareunia, hypotension and cardiac failure.⁷ Before embolization of uterine AVM, assessment of vascular anatomy is necessary which can be done through Doppler ultrasonography, CT, MRI.^{7,8,19} Doppler ultrasonography is a non-invasive and valuable modality for diagnosing uterine AVM. In grey scale ultrasonography, AVM may mimic other pelvic pathologies.¹⁷ Colour Doppler however adds to the diagnostic value of ultrasonography.¹⁸ Pulsed Doppler study of the lesion will show blood flow of low resistance and high peak velocities and will reveal turbulence.⁴ MRI shows uterine AVMs and properly demarcates the invasion of other organs. On MRI the uterus appears bulky with a focal mass, junctional zones disruption, numerous serpiginous flow related signal voids in the lesion and conspicuous parametrical

vessels.^{4,20} Gadolinium enhanced MRI shows hyper vascularity in which the arterial flow is prevailing. CTA on the other hand can also be performed to determine the characteristics of uterine AVMs.^{17,21} CT angiography is considered as a gold standard for diagnosing AVM nowadays. In Angiograms, the arteries which are involved are thicker, dilated and tortuous as compared to the normal arteries. They show early venous drainage in arterial phase and look like a mesh of vessels which is supplied by enlarged feeding arteries.¹⁷ Angiography although an invasive procedure but is very useful in detecting the leading feeder vessels which aids in embolization of AVM.²² In our patient, CTA was also done which showed multiple dilated serpiginous abnormal vessels more so on the left side, forming a tuft of vessels suggesting AVM. Hysteroscopy is also done but is of limited value.⁶ Patient's clinical history, ultrasound findings and BHCG levels should be correlated while making a diagnosis of AVM and differentiated from other pathologies of uterus such as retained products of conception, GTD, malignancies, haemangioma and varicosities.⁴

Management of uterine AVM include conservative treatment, oral medications, laparoscopic bipolar coagulation, uterine artery ligation, hysterectomy or TAE.^{14,20,23} The treatment of choice depends upon the clinical condition and symptoms of the patient. In asymptomatic or mildly symptomatic patients, the condition resolves spontaneously and requires no treatment. However, follow-up ultrasonography is advised in these cases.¹⁶ Oral contraceptive pills (OCPs) are also given to such patients while hysterectomy is done in life threatening bleeding patients. Many published case reports in the last decade chose TAE for treatment and in retrospective review articles the clinical success rate is more than 90%.^{24,25} Previously, hysterectomy or uterine artery ligation were done for uterine AVM. TAE has now preceded and considered as treatment of choice because of its ability to preserve fertility and being less invasive. Many authors have reported spontaneous resolution or regression of AVM with conservative management.¹⁹ Most of the published literature suggests that TAE does not cause high risk damage to ovarian function, fertility or major pregnancy outcome.²⁶⁻³⁰ However, side effects such as synechia, recurrent PPH, miscarriage and loss of ovarian reserve have

been reported.^{31,32,33}

The patient in our case underwent TAE in two sessions. There were no complications during and after the procedure. She conceived spontaneously later on. She was followed up in our gynaecological and obstetric OPD in our hospital regularly. She was admitted at 40 weeks for induction of labour in our hospital. She delivered a healthy baby through caesarean. Both the mother and the baby are fine and had no intraoperative or post-partum complications.

Conclusion

In conclusion, Transcatheter embolization is a successful and minimally invasive procedure for the management of uterine AVM and where facilities and skills are available, it should be offered to the patient.

Conflict of interest: None

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