Case Report

Defusing a Time Bomb – Embolization of a Uterine Arteriovenous Malformation with Venous Aneurysms

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ABSTRACT

Uterine Arteriovenous Malformation (AVM) is a rare disease and is usually an acquired disorder which can remain asymptomatic or cause life-threatening bleeding. Prompt diagnosis and management in the appropriate clinical setting is crucial. Imaging can diagnose and sometimes predict the possibility of future severe bleeds. Embolization is the mainstay of treatment, however should be performed using proper techniques of selective embolization avoiding physiological blood vessels supplying normal structures.

CASE REPORT

A 32-year-old lady presented with an episode of heavy bleeding two days earlier, on a background of multiple episodes of mild bleeding during the last three weeks. She had delivered her third child by normal delivery two months earlier.

At presentation, she was stable with pulse rate of 96 beats per minute, blood pressure of 110/60 mm Hg and haemoglobin of 8.6 mg%. Transabdominal and transvaginal B mode ultrasound and colour Doppler showed a bulky uterus and an abnormal cluster of multidirectional colour flow in the anterior wall of the lower uterine corpus more towards the right side. Transabdominal and transvaginal B mode ultrasound and colour Doppler showed a bulky uterus and an abnormal cluster of multidirectional colour flow in the anterior wall of the lower uterine corpus more towards the right side.

Raising a high suspicion of uterine AVM, a CT angiography of the pelvic vessels was performed which showed a tangle of blood vessels in the anterior wall of the lower uterine body representing the uterine AVM, early opacification of parauterine pelvic veins in the arterial phase, dilated bilateral ovarian veins, and most importantly, three large subendometrial vascular sacs representing either intranidal aneurysms or ectatic veins. Beta hCG levels were within normal limits.

Because of history of a recent episode of heavy bleeding, borderline hemodynamic status and presence of predictors of heavy uterine bleed, decision to treat the AVM by uterine artery embolization was arrived at. Digital Subtraction Angiography (DSA) performed during uterine artery injections on both sides through right femoral access and using a Robertson uterine angiography catheter confirmed the AVM fed principally by the right uterine artery and showed venous aneurysms. Since the flow rate within the AVM was not too rapid and there was no direct large arteriovenous shunt, gelfoam pledgets were chosen for embolization. After partial embolization of the AVM through the right uterine artery, an angiogram revealed a yet undemonstrated cervical artery. The catheter was navigated further closer to the AVM past the origin of the cervical artery and embolization was completed. The left uterine artery was seen to supply a hypertrophic vascular bed which was also embolized using gelfoam pledgets. Post embolization DSA of uterine artery on both sides showed complete occlusion of the AVM.

The patient had only two episodes of spotting after the procedure and was discharged the next day. The patient did not have any further episodes of bleeding and her normal menses resumed six weeks later.

DISCUSSION

AVMs are abnormal non-physiological communications between arterial and venous system by passing the capillaries. These can affect any part of the body and can occur in the uterus either as...
graphy is performed, but the patient can be directly subjected
pathologies however do not show an arteriovenous communication
disease induces the persistence of this hypervascularity [11]. These
retained products of conception and gestational trophoblastic
AVM. This gradually regresses and disappears [10]. Presence of
uterus at the implantation site secondary to normal physiological
differentiation between the two is not usually possible [3]. A focal
possibility of gestational trophoblastic disease, since a sonographic
after a sonographic suspicion of AVM is raised to rule out the
abortion bleeding per vaginum. Beta hCG should also be checked
which is one of the most common causes of post pregnancy or post
associated or alternate diagnoses of retained products of conception,
early diagnosis is important not only to direct appropriate
timely treatment, but also to avoid a curettage which can cause
catastrophic bleeding [1].
Diagnosis is usually suggested by an ultrasound with colour Doppler
which shows a focal cluster of abnormal multidirectional increased
flow signal within the uterus [1,3–9]. Ultrasound also can diagnose
associated or alternate diagnoses of retained products of conception,
which is one of the most common causes of post pregnancy or post
abortion bleeding per vagina. Beta hCG should also be checked
after a sonographic suspicion of AVM is raised to rule out the
possibility of gestational trophoblastic disease, since a sonographic
differentiation between the two is not usually possible [3]. A focal
hypervascularity can be seen in post pregnancy or post abortive
uterus at the implantation site secondary to normal physiological
changes in the myometrial vascularity, which might mimic an
AVM. This gradually regresses and disappears [10]. Presence of
retained products of conception and gestational trophoblastic
disease induces the persistence of this hypervascularity [11]. These
pathologies however do not show an arteriovenous communication
and early draining venous channels (arrow heads) and venous aneurysm (*).

Diagnostic angiography is usually performed to catheter angiography for diagnosis if an emergent indication
for embolization exists. CT and MR angiography can confirm the
diagnosis by showing an early draining vein, show clear extent of
AVM, feeding vessels, presence of gestational trophoblastic dis-
ease and presence of predictors of severe bleeding like enlarged
subendometrial vascular channels as in the present case [1,3–5].
Enlarged vascular sacs in an AVM represent either an intranidal aneurysm or venous ectasia. These indicate high flow, and when
present within the endometrial cavity or in subendometrial location,
predict a higher chance of severe bleed and requirement of an
intervention.

Multiple treatment options exist and choice depends on the age,
presentation, haemodynamic status, patient's desire to retain
uterus, desire for future conception and pregnancy, and the available
expertise in the place of treatment [1–8,12,13]. Conservative
management is followed when the AVM is incidentally detected or
if the bleeding episodes are minimal, not persisting or decreasing.
Otherwise, among the other options, embolization is the most
widely performed treatment. Embolizing agents used include
gelfoam, polyvinyl alcohol particles, cyanoacrylate glue and coils;
choice depends on the speed of flow through the AVM, presence
of prominent direct arteriovenous shunts, availability of materials
and operator expertise [1–6,8,12,13]. Like any other embolization
procedure, multiple intra procedural check angiographies should
be undertaken during uterine artery embolization, because some
cervical or vaginal arteries or utero-ovarian anastomoses may
become apparent after partial embolization of the pathological
vessels, which if undetected would be unnecessarily embolized,
sometimes resulting in cervical or vaginal necrosis or early ovarian
failure.

The present case illustrates this necessary step of caution – initially
underdimensioned cervical artery arising from the right uterine artery
becoming apparent after partial embolization of the AVM. Untoward
embolization of cervical or vaginal branches can be prevented by
further distal placement of catheter, or usage of microcatheter placed

![Digital subtraction angiography](image1.png)

![Contrast enhanced arterial phase computed tomography](image2.png)
further past the origin of these arteries. Fertility preservation post uterine artery embolization has always been a concern [1,3,7,9], even though there are multiple reports of successful pregnancy post embolization [7,12,13]. Hysterectomy is considered the last option. There are descriptions in literature of a few other management options used successfully including oral contraceptives, hormonal intrauterine device, hysteroscopic and laparoscopic surgeries [1,9,14].

CONCLUSION
Uterine AVM is a rare disorder, and can sometimes cause severe and fatal bleeding. Early diagnosis and management is important in the right clinical setting. Ultrasound confirms the diagnosis in most cases and if patient is not stable for conservative management, embolization is the most preferred method of treatment. Apart from selective uterine artery cannulation, multiple intraprocedural angiographies should be performed to prevent any untoward cervical, vaginal or ovarian ischemia.

REFERENCES

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FINANCIAL OR OTHER COMPETING INTERESTS: None.