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Arteriovenous Malformation in the Setting of a Possible Cesarean Scar Pregnancy Managed Surgically: A Case Report and Literature Review

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Background

Uterine arteriovenous malformation (AVM) is a rare gynecologic condition involving abnormal communication between myometrial arteries and veins. AVMs can be congenital or acquired, acquired AVMs often being a result of uterine instrumentation. Other causes of acquired AVMs include Complications of prior pregnancies, cesarean scar pregnancy, uterine infection, gestational trophoblastic disease (GTN) or gynecological malignancies.

Patients with uterine AVMs typically present with episodes of sudden heavy bleeding and can often lead to life-threatening hemorrhage. Moreover, the associated vaginal bleeding is often refractory to standard therapy. Therefore, proper diagnosis and treatment is critical.

Diagnosis is centered around imaging modalities such as computed tomography (CT), magnetic resonance imaging (MRI), ultrasound, and angiography. As transvaginal ultrasound is the imaging modality of choice in gynecology, diagnosis is often based on ultrasonographic evidence of hypoechoic areas in the myometrium with vascular flow. Features may be similar to other differentials including retained products of conception (POCs), GTN and hemangioma. Angiography can further be used to assess size and identify feeding vessels while a CT or MRI can help evaluate for adjacent organ involvement.

Treatment depends on hemodynamic stability of the patient and, more recently, desired future fertility. There have been case reports of successful treatment with conservative or medical management, uterine artery embolization (UAE), or laparoscopic coagulation for those desiring fertility preservation. Otherwise, hysterectomy is recommended.

This case describes the progression of a patient with persistent vaginal bleeding in the setting of a missed abortion, possibly a cesarean scar pregnancy, after failed medical then surgical intervention, found to have a delayed diagnosis of acquired uterine AVM. The purpose of this case report is to highlight the importance of considering the differential of AVMs based on ultrasonographic evidence leading to proper diagnosis, management, and overall patient care.

Case Presentation

Patient is a 31-year-old parity 1, with prior cesarean section 1 year ago, who was diagnosed by a private gynecologist with a missed abortion measuring 8 weeks by crown rump length. She opted for expectant management as she endorsed spotting at that time. At her follow up, she was given misoprostol and mifepristone for failed expectant management. Two weeks after, she only had spotting and ultrasound revealed "irregular collection of retained product with collapsing debris". Patient desired to avoid surgery, so she was given repeat medical management. Patient represented in 2 weeks with passage of large blood clots and ultrasound revealed irregular sac measuring 4.6x5.0x5.6cm. She opted for expectant management. One week later, patient presented to an emergency department with a septic abortion. She underwent a dilation and curettage (D&C) revealing chorionic villi and was given antibiotics.

Two weeks following surgery, the patient continued to have vaginal spotting with episodes of intermittent heavy bleeding. On ultrasound, there was concern for a "heterogenous vascular region in the anterior myometrium" and she was told she likely has a degenerating fibroid and expectant management, and pain control was recommended.

Now 3 months after initial presentation, patient presented to our practice for a second opinion given continued vaginal bleeding. Patient had a beta-human chorionic gonadotropin (beta-hCG) of 19 and ultrasound revealed a large anterior lower uterine mass with a transversing dilated vessel (1.7cm) concerning for a large vascular malformation. An MRI revealed an "aneurysmal expansion of the lower uterine segment with extremely thin myometrium likely reflecting expanded cesarean scar with dilated arteriovenous formation with a diameter of 1.1cm". Patient underwent bilateral UAE by interventional radiology with interval improvement of vaginal bleeding. Outpatient follow up revealed a negative beta-hCG and ultrasound revealing decrease in both the size and the vascularity of the AVM.

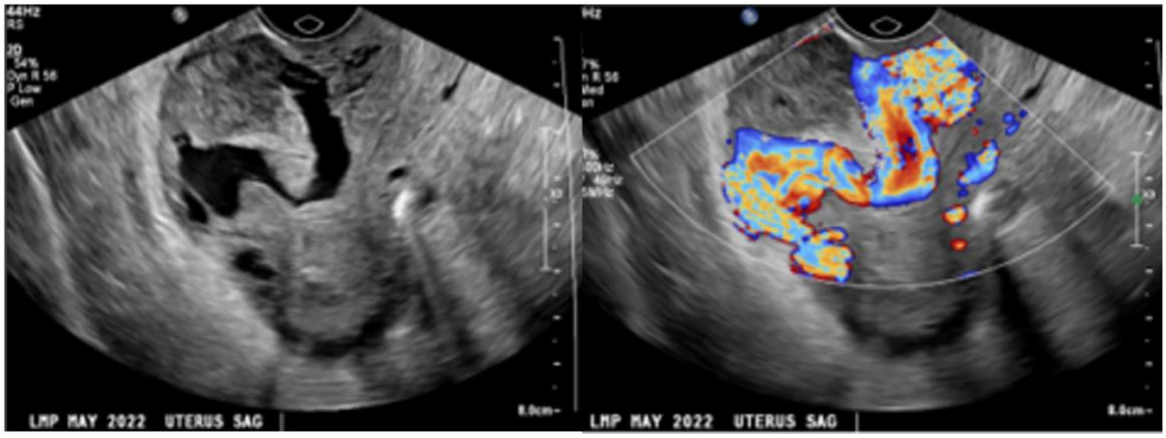

Figure 1: Ultrasound revealing a large anterior lower uterine mass with a transversing dilated vessel (1.7cm) concerning for a large vascular malformation.

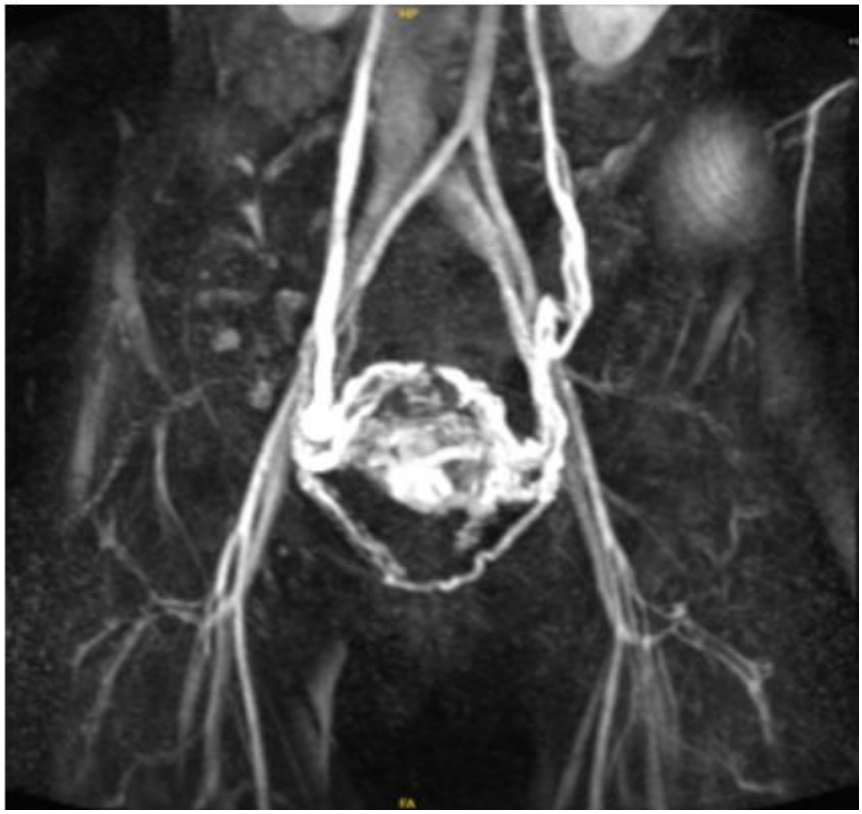

Figure 2: MRI visualizing aneurysmal expansion of the lower uterine segment with extremely thin myometrium likely reflecting expanded cesarean scar with dilated arteriovenous formation with a diameter of 1.1cm.

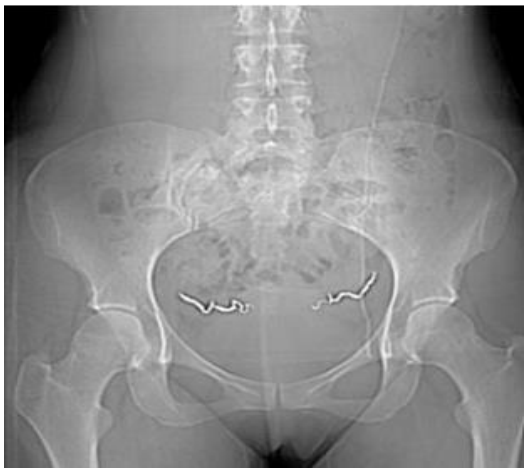

Figure 3: Status post bilateral uterine artery embolization by interventional radiology with confirmation of coil placement.

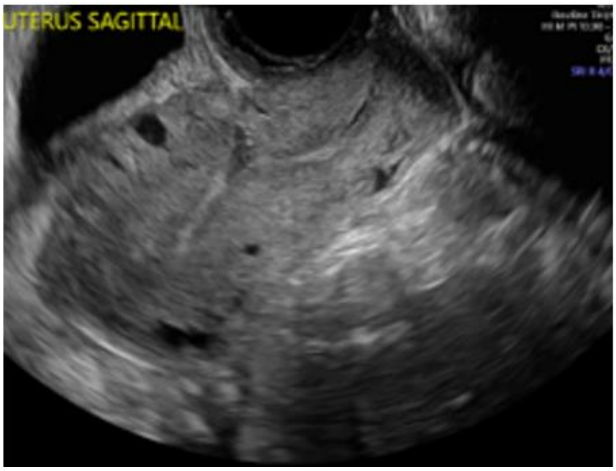

Figure 4: Outpatient ultrasound surveillance revealing resolution of arteriovenous malformation 4 weeks post uterine artery embolization.

Conclusion

The differential diagnosis includes retained products of conception, cesarean scar pregnancy, uterine perforation, AVM, degenerating fibroid, or GTN. Patient history, clinical presentation, and imaging guided diagnosis of uterine AVM with likely prior cesarean scar pregnancy and allowed for proper treatment in this patient.

This case highlights many important learning points. First, in cases with persistent heavy vaginal bleeding suggesting failed standard therapy, uterine AVM should be considered on the differential early. This is especially true with visualization of a vascular structure in the myometrium in the setting of recent instrumentation. As presented in this case, delayed diagnosis can impact patient care and safety.

Second, it is critical to rule out a cesarean scar pregnancy prior to treatment as this would affect management. In the case presented, it is unclear if the presenting diagnosis was truly a missed abortion or a possibly cesarean scar pregnancy due to the location of the AVM and retained products of conception. As cesarean scar pregnancies, infection, and D&C can precede the formation of an AVM, it is difficult to determine which one or combination of inciting events contributed to the acquired AVM. It is important to note that if a cesarean scar pregnancy was diagnosed at her initial visit, the patient would have undergone a very different treatment course, including methotrexate or surgical wedge resection.

Lastly, this case supports the use of UAE as a treatment for uterine AVMs in patients desiring fertility sparing management. Optimal treatment for AVM formation secondary to cesarean scar pregnancy is still unclear. Hysterectomy is still the recommended treatment for postmenopausal patients or patients with life-threatening hemorrhage requiring emergent treatment. Continued exploration of alternative treatment for women desiring future fertility and their success or postoperative risks and complications is necessary for proper treatment of this complex disease.

Teaching Points

1. In cases with persistent heavy vaginal bleeding suggesting failed standard therapy, uterine AVM should be considered on the differential early.
2. It is critical to rule out a cesarean scar pregnancy prior to treatment as this would affect management.
3. This case supports the use of UAE as a treatment for uterine AVMs in patients desiring fertility sparing management.

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