

A Rare Case of Arteriovenous Malformation Presenting as Secondary Postpartum Hemorrhage

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ABSTRACT

Postpartum hemorrhage (PPH) is a life-threatening complication and is the leading cause of maternal mortality. We, present to you a case of a 30-year-old primigravida who conceived with in vitro fertilization (IVF) and presented to the emergency department at 31 weeks of gestation in active preterm labor with a history of fever. The patient delivered vaginally and was stable initially. However, the following day she had complaints of vaginal bleeding and developed signs of sepsis. She was then shifted to the ICU and consequently started on uterotonics and higher antibiotics. An urgent Ultrasound and CT angiography were performed which revealed arteriovenous malformation (AVM) and fistula. Uterine artery embolization was performed successfully to control the bleeding after the failure of conservative Management.

Keywords: Postpartum hemorrhage, Arterio-venous malformation, Uterine artery embolization, Maternal mortality, Uterine atony, Placenta accreta spectrum (PAS)

INTRODUCTION

Postpartum hemorrhage (PPH) is defined as excessive bleeding following childbirth and up to 6 weeks postpartum, characterized by the loss of more than 500 ml of blood after a vaginal delivery or 1,000 ml after a cesarean section. According to the World Health Organization (WHO), approximately 14 million women worldwide suffer from postpartum hemorrhage (PPH) annually, resulting in approximately 70,000 maternal deaths globally. PPH is responsible for 25% of all maternal deaths and is the most common cause of maternal morbidity and mortality.[1] PPH is classified into primary (occurring within 24 hours of delivery) and secondary (occurring between 24 hours and 6 weeks postpartum). Primary PPH is most commonly caused by uterine atony, trauma, retained placental tissue, adherent placenta, clotting disorders.[2] There is evidence of the association between adherent placenta and arteriovenous (AV) malformations. A case report published in the journal *Diagnostics* highlighted a rare instance of a pregnant woman with placenta accreta spectrum (PAS) who developed uterine arteriovenous malformations postpartum.[4] Uterine Artery Embolization (UAE) is a minimally invasive procedure that can be used to treat severe postpartum hemorrhage (PPH) when conservative treatments fail. It involves occluding the uterine arteries to reduce blood flow and control bleeding. UAE can be used as an alternative if hysterectomy is being considered. According to a study published in the *World Journal of Emergency Surgery*, the success rate of the UAE in controlling PPH is 98.7%.[3] It is typically performed when uterotonics and manual compression fail to control bleeding.[5][6]

Uterine Artery Embolization (UAE) involves inserting a catheter into the femoral artery and navigating it to the uterine arteries. This process uses fluoroscopy and imaging to pinpoint the source of bleeding. Embolizing agents (particles, coils, or sponges) are injected to occlude blood vessels and in turn, reduce blood supply to the uterus which helps control the hemorrhage. Post-procedure, the patient is monitored for complications, and follow-up imaging is performed to ensure successful embolization.[5]

CASE REPORT

A 30-year-old Primigravida with 31 weeks of gestation with IVF conception presented to our hospital in the emergency department with complaints of abdominal pain since morning along with a history of fever and increased frequency of urination since the past two days. On examination pulse was 100/min, BP(blood pressure)100/70mmhg with a temperature of 99.0F.

On per abdomen examination the uterus was around 30-32 weeks with 3 /10'/20" contractions, and FHR present at the left spino-umbilical line. The internal examination suggested that her cervix was 5 cm dilated and well-effaced. As the delivery was imminent, the patient was given a loading dose of MgSO₄ for neuroprotection [8] and Group-B streptococcus (GBS) antibiotic prophylaxis. However, the decision to withhold steroids was taken given suspected chorioamnionitis.

On admission, Complete blood count (CBC), C-reactive protein (CRP), urine routine microscopy, blood culture, and urine culture were sent. The blood test suggested acute infection, and blood culture, along with urine culture, came positive for *E. coli* and *Klebsiella pneumoniae*.

The patient delivered vaginally within the next 4 hours; however, the placenta was found to be adherent and had to be removed piecemeal. Initially, due to uncontrolled bleeding – Inj. Oxytocin, Inj. methylergometrine, Inj. Carboprost and Tab Misoprostol were given in a stepwise manner until adequate control was achieved. Thereafter, she was kept under strict monitoring, and Inj. Tranexamic acid 1gm 8 hourly was given. Following this the bleeding was momentarily controlled.

CT-Computed tomography

On post-delivery day 1, patient developed high-grade fever along with signs of sepsis-like tachycardia, tachypnea, and leukocytosis [7] prompting an urgent transfer to the ICU given puerperal sepsis under evaluation. She was initially started on broad-spectrum higher antibiotics: Ceftriaxone + Sulbactam + Metronidazole. However, the patient did not show signs of improvement and WBC counts were on an increasing trend, so the antibiotics were escalated to Meropenem.

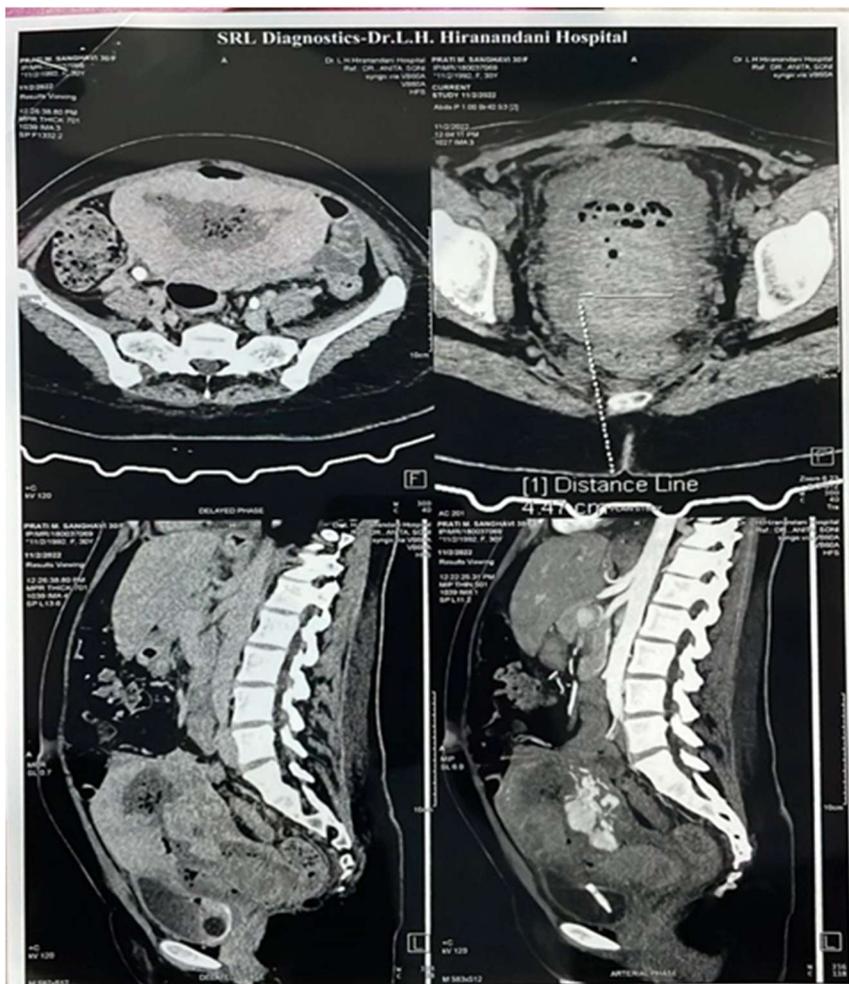


Image A: CT abdomen and pelvis-Bulky post-partum uterus with intensely arising endometrial lesion of 5.3 x 2 x 1.8cm suggestive of AV fistula with air/gas pockets and clots in endometrial and cervical canal.

Table-1 shows the trend of hemoglobin, white blood cell count, and CRP. The patient developed severe sepsis complicated with bone marrow suppression. Central venous access was taken; Norepinephrine infusion was started and 2-units PRBC (Packed red blood cell) transfusion was given.

According to the Culture Sensitivity report, Amikacin was added. On Day 2 post-delivery, an abdominal and pelvic ultrasound was performed, which revealed signs of placenta accreta spectrum disorder with a possible arteriovenous malformation (AVM). The lesion measured 6.5 × 2.4 cm and displayed a tight cluster of vessels with arterial-venous flow. A computed tomography angiography of the abdomen confirmed the diagnosis of an arteriovenous fistula as shown in image A

Despite all conservative measures, there was no improvement in the patient’s condition. After consulting with the patient, her relatives, and the interventional radiology team, uterine artery embolization was performed to control the bleeding on Day 3 post-delivery. Table-2 shows the trend of CBC and CRP levels following UAE and antibiotic administration.

Table 1: Showing trend of CBC and CRP before uterine artery embolization

	Day 0	Day 1	Day 2	Day 3
Hb(g/dl)	12.30	8.3	8.2	8.3
WBC (10 ³ /cumm)	16.2	34.04	20.18	4.84
PLT (lacs/cumm)	1.48	0.43	0.41	0.40
CRP (mg/L)	28.0	46	80.8	64.8

CBC-Complete blood count, CRP-C reactive protein, Hb-hemoglobin, WBC- White blood cells, PLT-Platelets

Table 2: Showing trend of CBC and CRP after uterine artery embolization

	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Hb(g/dl)	7.3	7.2	7.3	7.4	7.5	8.1	8.4
WBC (thousand/cumm)	12.4	14.42	16.84	20.87	18.78	12.15	11.01
PLT (lacs/cumm)	1.45	2.48	3.21	3.76	3.70	3.87	3.6
CRP (mg/L)	51.6	40	42	32	18.4	13.8	10.8

CBC-Complete blood count, CRP-C reactive protein, Hb-hemoglobin, WBC- White blood cells, PLT-Platelets

The same procedure was performed in our patient and following the procedure, the patient began to recover symptomatically. Her blood reports indicated a steady improvement and on Day 7 after UAE she was stable and fit for discharge.

CONCLUSION

PPH remains one of the critical challenges in obstetric care. Early detection and intervention are essential to reduce maternal mortality and improve patient outcomes. In this case, the use of uterine artery embolization allowed for the successful management of PPH secondary to arteriovenous malformation, avoiding the need for a hysterectomy. UAE should be considered a key tool in the management of PPH [3], especially in complex cases like AVM or other vascular abnormalities this case highlights the importance of timely diagnosis, proper imaging, and appropriate intervention in managing PPH.

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