

## **Postpartum Hemorrhage Caused by Pseudoaneurysm Associated with Malformations of the Uterus**

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**Uterine vascular abnormalities and pseudoaneurysm are rare but could cause serious delayed postpartum hemorrhage. Bleeding is usually recurrent and may be severe and occasionally potentially life-threatening.**

**We present the first diagnosed case reported from Bahrain. The patient was 23 years old, para 1, abortion 0, had recurrent postpartum hemorrhage following cesarean section caused by a traumatic pseudoaneurysm which was treated with hysterectomy. The treatment of choice is uterine artery embolization if diagnosed early and this method is particularly helpful to preserve the reproductive function in women.**

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Postpartum hemorrhage (PPH) remains the leading cause of maternal death in developing countries and a major challenge in obstetrics practice worldwide<sup>1</sup>.

It has been classified as either primary (occurring within 24 hours of delivery) or secondary (occurring 24 hours or more after delivery). Uterine hypotonia and genital tract trauma are considered the most common cause of primary PPH; retained products of conception, coagulation failure and endometritis are thought to be responsible for secondary hemorrhage<sup>2,3</sup>. Rare but important causes of PPH are post-traumatic uterine pseudo-aneurysm (PA) and arteriovenous fistula (AVF)<sup>4</sup>. Rupture of a uterine artery, PA or AVF usually presents as secondary PPH. In these condition women typically undergo a variety of interventions, such as uterine evacuation, blood transfusion or even hysterectomy before the definitive diagnosis is made.

The aim of this presentation is to highlight the clinical presentations of a rare cause of PPH due to vascular injury.

### **THE CASE**

A twenty-three-year-old Bahraini female, para 1, abortion 0, was admitted on the thirteenth day of post cesarean section with history of vaginal bleeding. She had an emergency cesarean section

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in another hospital when she was at term because of failure to progress. The operation was complicated by heavy blood loss (5 liters) which required a transfusion of several units of packed red blood cells. Postoperatively, she was kept in the intensive care unit (ICU). She was discharged home on the twelfth postoperative day. On arrival to Accident and Emergency department in Salmaniya Medical Complex, her vital signs were normal and there was minimal vaginal bleeding. Bimanual pelvic examination was declined by this patient. Pelvic and abdominal ultrasound was done and no abnormality was found. Ultrasound showed that the uterine cavity was empty. The patient was kept under observation. On the following day, she had a bout of heavy vaginal bleeding and her hemoglobin dropped to 7.9 g/dl. The patient was given Syntocinon® (Oxytocin) drip and an injection of Nalador® (Prostin); blood transfusion was initiated.

Ultrasound scan of abdomen and pelvis was repeated. There is no free fluid in the peritoneum. The endometrial cavity was filled with clots and no hematoma was seen. Hb: 7.4 gm/dl, platelets  $15 \times 10^9/L$ , INR 1:2, APTT 25, TT: 15, bleeding time 2 m, clotting time 2 m. After consultation with a hematologist, the following tests were requested: platelet function test, factor VIII level and Coombs test. Patient received 10 units of cryoprecipitate, 2 units of fresh frozen plasma and 2 units of packed red blood cells. She gradually improved and her vital signs became stable.

On the third day of her admissions, the patient experienced continuous mild vaginal bleeding. A third pelvi-abdominal ultrasound revealed a hematoma over the uterus and showed what looks like pieces of adherent placental tissue in the uterine cavity. A Doppler ultrasound showed an echogenic lesion 4.2x2.5 cm in lower uterine segment which showed a swirling flow on color Doppler suggestive of pseudoaneurysm (PA). A CT scan confirmed PA projecting into the uterine area and there is a feeding vessel from one of the pelvic arteries to the side of the intrauterine balloon tympanum. Patient suddenly had a gush of bleeding and became hemodynamically unstable; therefore, the management team proceeded for a total abdominal hysterectomy.

Examination of the removed uterus showed no abnormality apart from a placental tissue adherent to the lower segment. The diagnosis of the histopathological report was secondary PPH due to pseudoaneurysm.

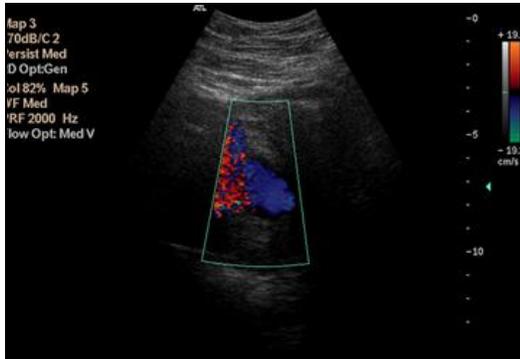
## **DISCUSSION**

Uterine vascular anomalies that lead to abnormal uterine bleeding are classified into 3 groups: (1) Uterine artery pseudoaneurysm, (2) Arterio-venous fistula and (3) Arterio-venous malformation.

These uterine arterio-venous malformations (AVMs) can be either congenital or acquired. The congenital AVMs tend to have multiple feeding vessels and draining veins with an intervening nidus<sup>5,6</sup>.

The congenital form can lead to intractable PPH or to abnormal uterine bleeding usually after a minor gynecological uterine procedure. In Gynecology there are several other conditions that can be associated with acquired AVMs, such as endometrial or cervical carcinoma and

gestational trophoblastic disease. Another form of acquired vascular abnormality is the traumatic PA of the uterine arteries which is more likely to be the cause when secondary PPH is intractable<sup>7</sup>. It could occur after a trauma of the uterine arteries during cesarean section with an extension of the uterine incision or surgery at advanced cervical dilatation<sup>8</sup>. Histology of PA shows that in contrast to true aneurysm, it lacks the three arterial layers, tunica intima, media and adventitia. This false aneurysm communicates with the main parent artery draining through the injury to that artery and its boundaries are usually the surrounding tissue and blood clots. The formed structure is very fragile and with any physical activity or increase in blood pressure it could rupture, resulting in intractable uterine bleeding, see figure 1<sup>8</sup>.



**Figure 1: A Transverse Color Doppler Image Shows a Swirling Blood Flow Pattern within This Structure**

In obstetrics, cesarean section is commonly found to be associated with the formation of vascular abnormalities<sup>9</sup>. This could be due to lateral extension of lower uterine segment incision or failure to secure the apex of an extension during repair. However, PA has also been reported even after normal vaginal delivery.

Secondary PPH due to PA of the uterine artery should be suspected if a woman presents with sudden onset of fresh vaginal bleeding usually between 24 hours and 14 days after delivery or surgery. Compared with PPH due to retained products of conception and/or endometritis, the bleeding is usually painless and is not associated with pyrexia. Treatment is either “observation” hoping that natural healing process will put a limit to this condition or uterine artery embolization if the bleeding persists and intervention is required<sup>10-12</sup>.

In this case there has been a delay in the management until the diagnosis was made by a Doppler ultrasound. Uterine artery angiography was advised to confirm the diagnosis of uterine arteriovenous abnormality or PA. Unfortunately, this case had an emergency hysterectomy when the patient developed a life-threatening intractable bleeding.

## CONCLUSION

**We present the first diagnosed case reported from Bahrain. The patient was 23 years old, para 1, abortion 0, had recurrent postpartum hemorrhage following cesarean section caused by a traumatic pseudoaneurysm which was treated with hysterectomy.**

**One should consider the diagnosis of pseudoaneurysm of the uterine vessels in cases of persistent or recurrent late postpartum hemorrhage particularly when all other predisposing causes are excluded.**

**The diagnostic test of choice in these cases is uterine artery angiography; Colored Doppler Ultrasound has been used, CT scan can be helpful in delineating the problem and facilitating the plan for the embolization procedure. A high index of suspicion and a multidisciplinary approach is often helpful in avoiding unnecessary hysterectomy in a moribund patient.**

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