

Arterial Embolization; A Lifesaving Solution in Placenta Accreta spectrum Post Hysterectomy: A Case Report

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ABSTRACT

Case Summary: A 25-year-old woman who was referred to our hospital at 38 week's gestation from another hospital as a case of placenta previa with possible accreta. She underwent cesarean hysterectomy and encountered severe postpartum hemorrhage that required massive transfusion of blood products and arterial embolization which was done and saved her life without further morbidity.

Conclusion: With increased prevalence of placenta accreta spectrum, arterial embolization facility should be an integral part of treatment protocol to save maternal life.

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INTRODUCTION

Abnormally adherent placenta which is called placenta accreta spectrum (PAS) in which the placenta is being in direct contact of myometrium or invades beyond throughout the uterine wall. It is being considered as the major obstetric complication of placenta previa with increased prevalence with the increased incidence of cesarean section delivery any other uterine procedure leads to endometrial damage.¹ According to the depth of trophoblast invasion into the myometrium, three subtypes of PAS can be differentiated by pathologists: placenta accreta, placenta increta, and placenta percreta.² Ultrasound is the first line tool in diagnosis and magnetic resonance imaging play a role in uncertain cases with high specificity and sensitivity. Based on correct diagnosis and assessment of depth of invasion, management strategies are tailored for the best maternal and perinatal outcome. A multidisciplinary placenta previa team composed of all healthcare providers shall be created and activated to manage such cases.^{3,4} Treatment strategies range from conservative to highly invasive procedures. All shall take in account patients' factors and expectations as well as the available resources and expertise. At our hospital; King Abdulaziz University Hospital; the team was established in 2016 by the department of obstetrics and gynecology to involve: experienced obstetrician in placenta previa surgeries, maternal fetal medicine, neonatologist, radiologist, anesthetist, intensivist, hematologist, urologist, and vascular surgeon. This team is readily available for all cases 24 hours a day, 7 days a week to ensure optimum care. This case report will show the importance and great value of successful arterial embolization after hysterectomy to control ongoing bleeding in critically unstable patient. A clinical pathway that integrates arterial embolization in PAS will be a lifesaving.

CASE PRESENTATION

A 25-year-old African woman, G5P4+0 was referred to our hospital at 38 weeks' gestation as a case of placenta previa with high possibility of accreta. At the time of her admission, she was asymptomatic and her antenatal care and follow up was unremarkable apart from obstetric ultrasound findings at 33 weeks' gestation of complete placenta previa. She reported one episode of minimal vaginal bleeding for which obstetric ultrasound was repeated and showed placenta previa and cannot rule out accreta. In the past obstetric history, she had four cesarean section deliveries: the 1st was due to uterine fibroid obstructing lower uterine segment, the 2nd was done as repeat of cesarean section, the 3rd was associated with placenta previa, and the 4th was a repeat of cesarean section. She had no chronic medical illnesses nor other surgeries.

Due to late presentation, we were not adherent to our placenta previa protocol that includes magnetic resonance imaging and preoperative arterial catheter insertion for embolization as preoperative step

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in placenta accreta spectrum. However, the remaining aspects of our placenta previa clinical pathway were implemented including preoperative consultation of anesthesia and critical care service, hematology, and blood bank for complete readiness by all blood products and notification of all other placenta previa team members about the case (Obstetricians, vascular surgeon, and urologist).

We obtained detailed informed consent from the patient who underwent elective surgery under general anesthesia.

Surgery started at 08:29 O'clock morning time. The abdomen was opened through the old skin incision, Pfannestiel; and with dissection of anterior abdominal wall layers a hard mass was found over anterior uterine wall suspected to be a calcified fibroid and was removed to allow the delivery of baby girl through upper segment incision with good Apgar score then total abdominal hysterectomy with bilateral salpingectomy was done. During the surgery, the patient lost about 4 L of blood and received 4 units of packed red blood cells and 4 units of platelets. The surgery ended at 12:20 O'clock noon time

Post operatively, she was transferred to the surgical intensive care unit where the already inserted peritoneal drain continued to show active blood loss.

Under direct care of hematologist, an active massive transfusion protocol was carried out and NOVO IIV (total of 14 mg) as well as Tranexamic acid 1 g IV were given too but the peritoneal drain keeps showing acting blood loss.

Computed tomography for pelvic uterine artery angiography was performed at 10 hours postoperative while the patient is still intubated, under inotropes support and revealed contrast extravasation with hemoperitoneum. It was discussed among placenta previa team members either to take her back to the operating room by obstetrician and vascular surgeon to control bleeder surgically or take her the angiography suite for arterial embolization. The decision was made to go for arterial embolization. Then under ultrasound guidance using micro puncture set, the right common femoral artery was punctured. 5- French sheath was introduced over the wire. A Tuomo guide wire and a flush catheter were used to cross the aortic bifurcation. The left internal iliac artery was catheterized and active extravasation from a branch of the anterior division of this vessel. A Bernstein catheter was advanced to the ostium of the bleeding branch and Gelfoam was initially used for embolization. Additionally, two 4x3 and one 5x3 0.035 Tornado coils were deployed at the ostium of this vessel. A postembolization angiography of the left internal iliac artery demonstrated that bleeding successfully stopped.

The patient hemodynamics showed immediate improvements and was transferred back to surgical intensive care unit and over the following 48 hours, she continued the improvement.

She was discharged from surgical intensive care unit in day 3 postoperative and discharged home on day 7 in good state of health.

The total units transfused were: 19 units of packed red blood cells, 25 units of platelets, 16 units fresh frozen plasma and 19 units of cryoprecipitate.

She lactated her baby and had very smooth recovery on follow up visits over one year period.

All through she maintained normal urine output and normal renal and liver function tests.

Histopathology examination confirmed placenta increta. Her wound healed very well.

DISCUSSION

Placenta accreta spectrum is one of the most serious and challenging obstetric condition with high risk of maternal mortality that reached up to 7% and primarily related to bleeding. It occurs when there is abnormal invasion of chorionic villi through defected decidua basalis [5] and according to the depth of invasion, it is classified as

- Accreta: it is attached to the myometrium
- Increta: it invades into the myometrium
- Percreta: it invades through the myometrium.

It has prevalence of 3 out of 1000 deliveries with increased frequency after prior uterine surgeries (mainly cesarean section).

Most of the clinical guidelines, surgical options to control postpartum bleeding along with medical therapy, are vascular ligations, uterine body hemostatic sutures, intrauterine balloon, and hysterectomy. However, bleeding may continue afterward from vascular pedicles of engorged obstetrics and pelvic vasculatures and mandates further strategies to save maternal life [6].

Vascular embolization in obstetrics and gynecology is being used for many conditions as uterine fibroid, vascular malformation, and control of obstetric hemorrhage [7]. Since 1979, trans arterial embolization is being used in post-partum hemorrhage. Diagnosis is made usually by ultrasound and magnetic resonance imaging is helpful whenever the ultrasound was inconclusive for diagnosis of accreta plectrum

Table 1: Some of the Patient's laboratory results

Time	Hb	Platelets	Hematocrit	INR	Lactate
Preoperative	11 g/dL	139 K/uL	32.5%	0.9 Ratio	Not done
4 hours postoperative	6.7 g/dL	101 K/uL	19.5%	0.8	4.7
6 hours postoperative	5.9 g/dL	97 K/uL	17%	1.0	7.2
8 hours post operative	5.2 g/dL	76 K/uL	15%	1.0	11.4
4 hours post embolization	7.8 g/dL	126 K/uL	21%	1.0	3.2
Day 1 postoperative	9.8 g/dL	166 K/uL	26%	1.0	Not done
Day 2 postoperative	8.8 g/dL	170 K/uL	25%	1.0	Not done

^[8]. Once the diagnosis of placenta accreta spectrum is made, the delivery should be carried out in healthcare facility where the appropriate expertise and services are readily available including experienced obstetrician in such cases, obstetric anesthesia team, critical care facility, blood bank for rapid and efficient replacement protocol.

As part of management, detailed informed consent including the potential need for hysterectomy, transfusion medicine and admission to critical care unit. The anticipation for the utilization of arterial embolization in hemodynamically stable patient with preoperative placement of catheter is commonly considered practice for safe outcome. Hemodynamic instability should not be considered as contraindication.^{5,6}

Severe postpartum hemorrhage causes up to 25% of maternal deaths worldwide and the major factor for such adverse outcome is the delay in providing the appropriate management.

Few studies reported the use of arterial embolization after hysterectomy in postpartum hemorrhage and some reported cases of its utilization in severely unstable patients,^{9,10} Our case had showed its great value and significant benefits with no further increase in patients' morbidity. This shall be considered as the first option whenever ongoing bleeding is suspected and never eliminate or undervalue the importance of multidisciplinary team care by other team members to achieve the best outcome.

Conclusions Our case has confirmed the great value and importance of utilization of arterial embolization to control obstetric hemorrhage even post hysterectomy and in critically unstable patient.

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