

Postpartum Hemorrhage: The Ultimate Challenge- A Case Study

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Abstract: *Postpartum haemorrhage (PPH) is a leading cause of maternal mortality in developing countries and the primary cause of nearly 30% of all maternal deaths globally. A "nearmiss" event involving a primi gravida with postpartum haemorrhage, disseminated intravascular coagulation, shock, recto vaginal fistula, sepsis and acute kidney injury managed successfully by team consisting of obstetricians, anaesthetists, nephrologist, surgical gastroenterologist and critical care experts is reported here. The aim of the report is to stress the need of patient education, importance of emergency transportation and availability of multidisciplinary team and adequate blood for transfusion at all levels of health care system.*

Keywords: Near-miss, obstetric haemorrhage, maternal morbidity, maternal mortality

1. Introduction

Postpartum haemorrhage (PPH) is a leading cause of maternal mortality in developing countries and the primary cause of nearly 30% of all maternal deaths globally. They are defined by the World Health Organization (WHO) as postpartum blood loss (above 500 ml in normal delivery). PPH is a clinical diagnosis that encompasses excessive blood loss after delivery of the baby from various sites- Uterus, Cervix, Vagina, and Perineum. The four critical causes of PPH are atony, trauma, retained placenta or adherent placenta, and coagulation abnormalities. The most common cause is uterine atony, which is episodic and unpredictable. Atonic PPH occurs due to the failure of contraction of the Uterus after delivery of the fetus. Often, the ferocity and rapidity of blood loss leaves very little time for resuscitation and lead the patient down to a vicious cycle of hypovolemic shock, DIC, and further blood loss. Atonic PPH requires applying knowledge, experience, and a multi-disciplinary approach to maximize-- the possibility of a successful outcome.

2. A Case Report

A 30-year woman, a primigravida, delivered an alive-term baby by vacuum application at a private hospital. She had atonic PPH and was transfused with two units of a packed cell. Due to failed medical management patient was referred to a nearby private corporate hospital with vaginal packing. On admission, she (on the day delivery) was found drowsy, with severe pallor in hypovolemic shock. She was intubated and started on inotropic support, with four units of blood and eight units of blood products transfused. She had a fall in hemoglobin despite transfusion. On PND 1 on local examination, her episiotomy wound had given away, and a rectovaginal fistula was observed. She underwent a CT angiogram Which showed areas of active ooze in the lower vagina along with extensive hematoma and Uterus postpartum filled with packs. Based on the report,

transarterial embolization of the terminal branch of the left internal iliac artery was performed.

Examination under anesthesia was done, and one vaginal pack was removed. As there was persistent bleeding, an exploratory laparotomy was planned. Intraoperatively the lower uterine segment was distended with packs; the two large packs were removed through hysterotomy. Peripartum hysterectomy was done and proceeded with bilateral internal iliac artery ligation. She received a total transfusion of 104 blood and blood products in 15 days. Four cycles of sustained low-efficiency dialysis and one cycle of hemodialysis were also administered. Then she was referred to Government Rajaji Hospital, Madurai, with an antishock garment on PND 16.

While receiving, the patient was intubated with SEPSIS, TRALI, DIC, AKI, and Global hypokinesia with EF 35%. Local examination showed a rectovaginal fistula. The patient was continued on mechanical ventilation. She was under the multi-disciplinary care of obstetricians, anesthetists, cardiologists, otorhinolaryngologists, nephrologists, and surgical gastroenterologists. Tracheostomy was done as she needed prolonged mechanical ventilator support. On her PND 25, the patient had 1 episode of cardiac arrest and was revived with two cycles of cardiopulmonary resuscitation. She was treated with higher antibiotics like meropenem and piperazinetazobactam, metoprolol, diuretics, mucolytic, bronchodilators, soda bicarbonate, and total parenteral nutrition. Twelve units of FFP were transfused. Improvement in blood parameters was noted in serial monitoring. With clinical improvement, the patient was tapered from the ventilator and extubated on PND 35. She was kept on non-invasive ventilation for a while and then to room air; with the expertise of surgical gastroenterology, diversion colostomy was done for a high-grade rectovaginal fistula. Psychiatry opinion was obtained, and counseling was given to the patient and her family. On the 74th post-natal day, the patient was discharged without venous-- thromboembolism in an ambulatory state to look after her infant.

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3. Discussion

Postpartum haemorrhage is a leading cause of maternal mortality and morbidity worldwide-75-90% of these hemorrhage results from uterine atony. Delayed and substandard obstetric care can cause death within hours of major obstetric hemorrhage. Prenatal identification of at-risk women, prompt assessment of blood loss, effective management, and involvement of multi-disciplinary teams are of utmost importance to save lives. However, even with the best antenatal care, PPH can occur, it can also occur without any risk factors. The first step in management is achieving hemodynamic stability; second, the arrest of bleeding; simultaneously. Cases of refractory PPH are managed by postpartum hysterectomy, which results in complete inability to host a future pregnancy, a psychological impact, and risk of intraoperative surgical morbidities.

Management involves four components, all of which must be taken simultaneously, including a call for help, resuscitation, bleeding arrest, and monitoring investigation. The cornerstone of resuscitation during PPH is restoring blood volume and oxygen-carrying capacity, which includes establishing two 14-gauge intravenous lines, 20 ml blood samples for diagnostic tests, including complete blood count, coagulation screen, and fibrinogen urea electrolytes, and cross-matching minimum of 4 units blood. A high concentration of oxygen (15l/minute) should be administered.

Regardless of the cause of major Obstetric Haemorrhage, uterine massage, bimanual uterine compression to stimulate contraction, uterotonic drugs should be administered until the bleeding stops. If the pharmacological method fails to control bleeding in atonic PPH, exclude other or additional causes by undertaking clinical examination in theatre. The subsequent intervention is a mechanical method to control by balloon catheter tamponade instituted before considering surgical procedures.

Balloon tamponade: The various balloons used are Foley's catheter, Rusch balloon, Bakri balloon, Sengstaken-Blackmore oesophageal catheter or sterile glove, and a condom. Failure to arrest bleeding by intrauterine balloon tamponade in uterine atony requires immediate surgical interventions.

Uterine artery embolization is helpful in situations in which preservation of fertility is desired when surgical options have been exhausted in controlling PPH. Emergency indications are persistent atonic PPH and surgical complications, uterine tears at the time of cesarean section, bleeding following hysterectomy. Access to the anterior division of the internal iliac artery is via a femoral artery approach and is done by injecting gelatin particles. The use of polyvinyl alcohol particles is, however, permanent. It usually offers a very high success rate of 75-100%.

Intravascular Aortic Balloon Occlusion (IABO) has emerged as a prophylactic, simple, safe, and minimally invasive method in managing life-threatening PPH and conservatively managing abnormal placentation.

Uterine compression sutures: These compression sutures exert a mechanical compression of the uterine vascular sinuses without occluding either uterine arteries or uterine cavity. Several modifications of this technique developed mainly aiming at greater simplicity and applicability with equivalent efficacy like Chi-Square sutures, Hayman sutures, Pereira suture, and Cervico Isthmic Compression sutures.

Vascular ligations: The objective is to decrease blood flow to the Uterus to arrest life-threatening PPH before hysterectomy when medical therapy is unsuccessful.

Bilateral uterine artery ligation: 90% of the uterus blood supply in pregnancy comes from these vessels. If this measure fails to control bleeding, the next step is ovarian artery ligation.

Bilateral ovarian artery ligation: it arises from the abdominal aorta and forms utero-ovarian vascular anastomosis. A suture is placed on the ovarian artery through the avascular area in the mesovarium. If this also fails to control, then the next step is internal iliac artery ligation.

Internal iliac artery ligation: it causes an almost 85% reduction in pulse pressure in those arteries distal to ligation, thereby causing the arterial pressure system into one with pressure approaching those in the venous circulation and providing hemostasis via clot formation. It needs expertise in doing this and avoids the complication of injury to vessels and the ureter.

Hysterectomy: Peripartum hysterectomy can be total or subtotal; it is done as a last resort when all other methods to control PPH fail. The common indications are abnormal placentation with placenta increta, accreta, percreta, rupture uterus where repair is not possible, persistent atonic PPH. It should not be delayed too long till the woman is moribund. Subtotal hysterectomy is the choice unless there is a trauma to the cervix or lower uterine segment. The maneuver of aortic compression helps control bleeding in the surgical field for severe cases.

Recombinant Activated Factor VII: This procedure is an expensive one. The current recommendation is that it should be used after the failure of conventional methods. A significant concern is, it causes thrombin bursts, promoting clotting in open vessels. Women with severe PPH are particularly susceptible to severe hypofibrinogenaemia, and these are cases where factor VIIa is considered.

4. Conclusion

Globally, PPH is the leading cause of maternal mortality and morbidity. Prevention plays a significant role by identifying high-risk factors and active management of labor. Management is medical, mechanical, surgical, and radiological. A multi-disciplinary approach is essential in severe hemorrhage. Availability of blood and blood products is essential. It is imperative to identify the etiology, though uterine atony. Prediction and assessment of blood loss

remain the cornerstone for prompt and effective management of PPH.

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