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(CASE REPORT)



Hemorrhagic shock subsequent to an unscarred uterine rupture in a primigravida: A rare case report

NAWFAL CAIDI ¹, HANAA LAZHAR ^{2,*}, AZIZ SLAOUI ^{2,3}, Aicha KHARBACH ³, Aziz BAYDADA ² and RAJAE TACHINANTE ¹

¹ Department of Anesthesia and Critical Care, Souissi Maternity Hospital, University Hospital Center Ibn Sina, University Mohammed V, Rabat, Morocco.

² Department of Gynaecology-Obstetrics and Endoscopy, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco.

³ Department of Gynaecology-Obstetrics and Endocrinology, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco.

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Abstract

Peripartum hemorrhage (PPH) is the leading cause of maternal mortality and morbidity. It may be subsequent to many aetiologies such as uterine rupture. It usually occurs during vaginal birth with a scarred uterus and rarely in unscarred ones. Clinical assessment is mandatory to identify parturients at risk of PPH. The anesthesiologist alongside the obstetrician are major stakeholders in managing hemorrhagic shock. We hereby present the uncommon case of a hemorrhagic shock subsequent to an unscarred uterine rupture in a primigravida at 34 weeks' gestation. The immediate presence of the anesthesiologist and quick decision making brightened the prognosis. Through this article we stressing the importance of multidisciplinary collaboration and establishing protocols to unify PPH hemorrhage even when it's unexpected.

Keywords: Hemorrhagic shock; Uterine rupture; Cesarean; Mortality

1 Introduction

Peripartum hemorrhage (PPH) continues to be the leading preventable cause of maternal morbidity and mortality [1-2]. Albeit uterine rupture (UR) is rare, it's considered as the most life-threatening emergency in obstetrics. It's associated with a high maternal and perinatal morbidity and mortality [3]. A uterine rupture usually occurs subsequently to vaginal birth in a scarred uterus and exceptionally in unscarred uterus. Despite advances in obstetrics and critical care management, sometimes peripartum hemorrhage overwhelms the compensatory mechanisms leading to poor outcomes. The surgeon- anesthesiologist relationship and co-management is the cornerstone for a positive outcome [4].

We hereby present the uncommon case of hemorrhagic shock secondary to an acute uterine rupture in a primigravida where synergic management from the anesthesiologist and the gynecologist was salvific.

* Corresponding author: HANAA LAZHAR

2 Case report

We hereby present the case of a term primigravida at 34 weeks' gestation that presented to our obstetrics emergency department for sudden onset severe abdominal and chest pain. The patient had no remarkable history. Her obstetrical follow-up was on point.

Her general examination revealed signs of hypovolemic pre-shock compromising orthostatic hypotension, heavy sweating and involuntary tremor in the extremities. Her systemic examination showed a pale patient with low blood pressure at 80/44 mmHg, sinus tachycardia with a pulse rate at 165 bpm, capillary refill time was longer than 5 seconds and oxygen saturation at room air was within normal range. The abdomen was distended and tender on palpation. There was a fluid thrill and a shifting dullness. The patient had no contractions associated with vaginal bleeding with a closed cervix. Ultrasound examination at admission revealed a living extrauterine fetus of 34 weeks with severe fetal bradycardia at 50bpm and free peritoneal fluid. Initial assessment leads to hemorrhagic shock and acute fetal distress secondary to uterine rupture as the main diagnosis.

The patient was transferred to the operating room for emergency Cesarean due to rapid maternal deterioration and severe bradycardia.

Meanwhile, as the anesthesiologist on call, we were instantly paged since immediate resuscitation was a priority. Two large bore venous access were secured to start intravenous infusion of warm crystalloids. Oxygen by mask was immediately set at 10 liters /minute. Blood was drawn for a complete blood count, coagulation parameters, typing and cross match. A heating blanket was set to avoid hypothermia. After securing 4 units of packed red blood cells from the blood bank, a general anesthesia with endotracheal tube was performed.

Upon exploring the abdominal cavity, we noticed a mild hemoperitoneum estimated to 2 liters, a ruptured anterior uterine wall involving the isthmus and the lower segment (figure). The fetus was viable and floating alongside the placenta in the abdominal cavity. A C-section was performed with delivery of a viable male fetus weighing 2300g with an Apgar of 5 then 7 at 1 min and 5 minutes respectively. The baby was immediately transferred to the neonatal intensive care unit. Given the desire for fertility and the limited extension of the uterine rupture, the gynecologist performed a two layers hysterorrhaphy allowing hemostasis to be achieved.

During the procedure, monitoring was continuous based on an invasive arterial line for blood pressure, patient's color, heart rate and urine output. In total, the patient received 1.5 liters of isotonic crystalloids and was transfused with 5 units of packed red blood cells. We administered 1g of tranexamic acid and 2g of calcium chloride. We were able to maintain mean blood pressure on the whereabouts of 65 mmHg by iteratively administering IV phenylephrine.

Postoperative care was uneventful. Postoperative CBC showed a hemoglobin at 10g/dl, normal platelets and normal blood count. The patient was discharged on the 5th day. The baby stayed longer in the NICU as he was intubated and presented with seizures.

3 Discussion

Peripartum hemorrhage (PPH) accounts for 8% of maternal deaths in developed countries and 20% in developing countries [2]. As a matter of fact, World Health Organization (WHO) launched a study regarding maternal mortality stating that 25-30% of maternal deaths are due to peripartum hemorrhage globally [5]. PPH can be subsequent to uterine rupture (UR) as it remains one of the most flustering obstetrical complications. It's associated with a high rate of maternal and perinatal morbidity and mortality. UR mainly occurs during the second and third trimester in women with a history of uterine scarring [6]. The increasing rates of primary caesarean section contributes to the rise in the incidence of scarred uterine rupture in developed countries [7]. However, in our patient, UR occurred in an unscarred uterus.

UR is defined as a tearing of the uterine wall during pregnancy or delivery. In one hand, clinically significant uterine scar rupture is defined as a full thickness tear of the uterine wall that also includes uterine serosa (overlying peritoneum). It leads to major complications such as fetal distress, hemorrhagic shock, exclusion/ protrusion of the placenta/fetus in the abdominal cavity, the need for emergency cesarean section and usually imposes a hysterectomy. In the other hand, uterine scar dehiscence is common and exceptionally leads to fetal or maternal complications [8]. In our case, it was a significant uterine rupture as the fetus and placenta were found floating in the abdominal cavity.

Clinical presentation in UR differs depending on the existence of a previous uterine scar and the location of the rupture. Patients with suspected UR should be assessed rapidly for hemodynamic stability [9]. General examination looking for hypotension and tachycardia should be a major concern. Hemorrhagic pre-shock can be associated with dizziness, lightheadedness, nausea, vomiting and tremors in the extremities. In our case, pre-shock symptoms were obvious and hemodynamic assessment was first performed.

Vaginal bleeding is rare as the most of the bleeding occurs intra-abdominally. However, abdominal pain is commonly seen in patients with UR. It's usually described as a "ripping" sensation whereas chest pain is felt when there is blood in the peritoneum explaining chest pain in our patient. Fetal heart abnormality is subsequent to reduced blood flow. Fetal bradycardia is the most common abnormality associated with UR [10]. As a matter of fact, overall, UR presented in our case with a hemorrhagic shock following an acute onset severe abdominal and chest pain, vaginal bleeding and fetal distress- bradycardia like-.

Uterine rupture must prompt immediate assessment and management conditioning maternal and neonatal outcome [11]. Multiple tasks have to be carried out quickly and simultaneously in the event of massive hemorrhage. Therefore, communication between obstetricians and anesthesiologist is adjutory [12].

Anesthesiologists are major stakeholders as they are usually called upon to provide their unique skill sets and expertise to the management of peripartum hemorrhage whether it's anticipated or not [13].

The anesthesiologist needs to perform a proper pre anesthetic evaluation, to assess and manage intravascular depletion, to start prompt resuscitation with continuous monitoring and manage post-partum analgesia and recovery plan. Preanesthetic evaluation imposes anesthesiologist involvement before delivery in order to identify parturients with risk factors. Biological investigations aim to assess hemoglobin levels, coagulation aspect and blood type so as to secure enough blood from the blood bank before anesthesia [14].

Intravascular depletion assessment is exacting as blood loss is usually underestimated. The anesthesiologist needs to monitor carefully any sign suggestive of hypovolemia such as hypotension, heart rate >120bpm , urine output <0,5ml/kg/minute and capillary refill time <5 seconds. The royal college of obstetricians and gynecologists guidelines stress the importance of adapting fluid therapy by continuously monitoring maternal vital signs, urine output, hemoglobin and acid base balance [15].

Fluid and blood replacement therapy is guided by the clinical picture. Until blood is available, vascular infusion using crystalloids should get started. If transfusion is needed, compatible red cell concentrate is the best fluid to make up for major blood loss [16].

Preoperatively, the anesthesiologist should work hand in hand with the obstetrician to stop the bleeding and compensate blood loss [17].

Obstetric management relies on fetal delivery and repair of the ruptured uterine wall. Some cases of uterine and internal iliac arterial ligation have been reported. If blood loss is unmanageable, hysterectomy may be the last resort [18]. In our case, uterine rupture repair was possible using double layer sutures. No arterial ligation was performed because it was deemed unnecessary.

Abbreviations

- **PPH:** Peripartum Hemorrhage
- **UR:** Uterine Rupture
- **C-section:** Cesarean
- **IV:** Intravenous
- **NICU:** Neonatal Intensive Care Unit
- **CBC:** Complete Blood Count

4 Conclusion

Peripartum hemorrhage is a life-threatening preventable condition. Prompt assessment and management are key for a positive outcome. Synergic collaboration between the anesthesiologist and the obstetrician is compulsory in order to improve maternal morbidity and mortality. Every maternity should have its own protocol and guidelines so as to develop a systematic approach ranging from preanesthetic evaluation to postoperative care.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest

Statement of ethical approval

Ethics approval has been obtained to proceed with the current study.

Statement of informed consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Author contribution

NC: study concept and design, data collection, data analysis and interpretation, writing the paper. HL: study concept and design, data collection, data analysis and interpretation, writing the paper. AS: study concept, data collection, data analysis, writing the paper.

Guarantor of Submission

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Availability of data and materials

Supporting material is available if further analysis is needed.

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References

- [1] Making pregnancy safer. Geneva: World Health Organization, 2007.
- [2] Say L, Chou D, Gemmill A, et al. Global causes of maternal death: a WHO systematic analysis. *Lancet Glob Health* 2014;2(6):e323-e333.
- [3] Miller DA, Goodwin TM, Gherman RB, Paul RH. Intrapartum rupture of the unscarred uterus. *Obstet Gynecol* 1997;89:671–3. [PubMed]
- [4] Cooper JB. Critical Role of the Surgeon–Anesthesiologist Relationship for Patient Safety. *Anesthesiology*. 2018
- [5] Bouvier-Colle MH, Ould El Joud D, Varnoux N, Goffinet F, Alexander S, Bayoumeu F, et al. Evaluation of the quality of care for severe obstetrical haemorrhage in three French regions. *BJOG* 2001;108:898–903 [PubMed]
- [6] E. Ilunga-Mbaya, O. Nyakio, R. Maroyi, P. Bigabwa, M. Kiminyi, S. Hamisi, et al., Spontaneous open book uterine rupture at 15 weeks' gestation in a pauciparous woman with scarred uterus: a case study, *Pan Afr. Med. J.* 36 (2020) 44, <https://doi.org/10.11604/pamj.2020.36.44.20692>, eCollection 2020.
- [7] Murphy DJ. Uterine rupture. *Curr Opin Obstet Gynecol.* 2006 Apr;18(2):135-40. doi: 10.1097/01.gco.0000192989.45589.57. PMID: 16601473.
- [8] Tanos V, Toney ZA. Uterine scar rupture - Prediction, prevention, diagnosis, and management. *Best Pract Res Clin Obstet Gynaecol.* 2019 Aug;59:115-131. doi: 10.1016/j.bpobgyn.2019.01.009. Epub 2019 Feb 10. PMID: 30837118.
- [9] Togioka BM, Tonismae T. Uterine Rupture. [Updated 2022 Jun 27]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-
- [10] ACOG Practice Bulletin No. 205: Vaginal Birth After Cesarean Delivery. *Obstet Gynecol.* 2019 Feb;133(2):e110-e127. [PubMed]

- [11] Leung AS, Leung EK, Paul RH. Uterine rupture after previous cesarean delivery: maternal and fetal consequences. *Am J Obstet Gynecol.* 1993 Oct;169(4):945-50. [PubMed]
- [12] James AH, Kouides PA, Abdul-Kadir R, Edlund M, Federici AB, Halimeh S, et al. Von Willebrand disease and other bleeding disorders in women: consensus on diagnosis and management from an international expert panel. *Am J Obstet Gynecol* 2009;201:12e1-8. [PubMed] doi: 10.1016/j.ajog.2009.04.024
- [13] Laurence Ring MD Assistant Professor , Ruth Landau MD Virginia Apgar Professor of AnPostpartum Hemorrhage: Anesthesia Management, *Seminars in Perinatology* (2018), doi: <https://doi.org/10.1053/j.semperi.2018.11.007>
- [14] Graham WJ, Bell JS, Bullough CW. Brouwere V, Lerberghe W. Can skilled attendance at delivery reduce maternal mortality in developing countries? Safe motherhood strategies: A review of the evidence. *Studies in Health Organisational Services and Policy.*2001:97–129.
- [15] Karlsson O, Jeppson A, Hellgren M. Major obstetric hemorrhage: monitoring with thromboelastogram, laboratory analysis or both? *Int J Obstet Anesth.* 2014;23(1):10-7 [PubMed] doi: 10.1016/j.ijoa.2013.07.003
- [16] Mitty HA, Sterling KM, Alvarez M, Gendler R. Obstetric hemorrhage: prophylactic and emergency arterial catheterization and embolotherapy. *Radiology* 1993;188:183–7. [PubMed] DOI: <http://dx.doi.org/10.1148/radiology.188.1.8511294>
- [17] The Royal College of Obstetricians and Gynaecologists (RCOG). Antepartum hemorrhage: Green top guidelines no.63. London:RCOG; 2011. Available at <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg63/>
- [18] Glaze S, Ekwalanga P, Roberts G, Lange I, Birch C, Rosengarten A, et al. Peripartum hysterectomy: 1999 to 2006. *Obstet Gynecol* 2008;111:732-8. [PubMed]