Journal of Society Medicine
Research & Review Articles on Diseases
Journal of Society Medicine. 2025; 4 (7)

Management of a Critically Ill Post-Cesarean Section Patient with Antepartum Hemorrhage Due to Placenta Previa Totalis in a G2P1A0 at 27–28 Weeks Gestation with Severe Preeclampsia, HELLP Syndrome, Pulmonary Edema, Stage 2 Acute Kidney Injury, and Hypoalbuminemia

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ARTICLE INFO

Article history:
Received
10 May 2025

Revised
4 June 2025

Accepted
31 July 2025

Manuscript ID:
JSOCMED-020425-47-4

Checked for Plagiarism: Yes

Language Editor: Rebecca

Editor-Chief:
Prof. AznanLelo, PhD

ABSTRACT

Introduction: Massive antepartum hemorrhage in pregnancy, particularly due to placenta previa totalis, poses life-threatening risks requiring intensive care unit (ICU) management. The ROSE (Resuscitation, Optimization, Stabilization, Evacuation) approach is critical in managing critically ill patients with massive bleeding, emphasizing fluid resuscitation, massive transfusion protocols, and coagulopathy management. This case report highlights the complex management of a patient with placenta previa totalis, severe preeclampsia, and HELLP syndrome, complicated by pulmonary edema, acute kidney injury (AKI), and hypoalbuminemia.

Case Description: A 35-year-old woman, G2P1A0 at 27–28 weeks gestation, was admitted to the ICU following an emergency cesarean section due to antepartum hemorrhage from placenta previa totalis. She presented with hemorrhagic shock and severe preeclampsia complicated by HELLP syndrome. Initial resuscitation at a referring facility included 2000 cc Ringer's lactate and 500 cc 0.9% NaCl. In the hospital, damage control surgery and massive transfusion (packed red blood cells, fresh frozen plasma, and platelets) were performed. Postoperatively, the patient required mechanical ventilation and vasopressor support in the ICU. On day 1, she developed volume overload, pulmonary edema, stage 2 AKI, and hypoalbuminemia, managed with furosemide. Extubation was achieved on day 3, and she was transferred to the high-care unit on day 4.

Conclusion: In pregnant patients with trauma and massive hemorrhage, early diagnosis, damage control surgery, and appropriate massive transfusion management are critical interventions required to save the patient's life.

Keywords

Pregnancy, Preeclampsia, Massive Hemorrhage, Massive Transfusion Protocol

How to cite: Bernadeth, Erlangga ME. Management of a Critically Ill Post-Cesarean Section Patient with Antepartum Hemorrhage Due to Placenta Previa Totalis in a G2P1A0 at 27–28 Weeks Gestation with Severe Preeclampsia, HELLP Syndrome, Pulmonary Edema, Stage 2 Acute Kidney Injury, and Hypoalbuminemia. *Journal of Society Medicine*. 2025; 4 (7): 227-231. **DOI: https://doi.org/10.71197/jsocmed.v4i7.225.**

INTRODUCTION

Massive antepartum hemorrhage in pregnancy represents a life-threatening condition that necessitates intensive care unit (ICU) management owing to its dynamic and complex nature [1]. Such cases require meticulous monitoring and supportive interventions, with a primary focus on stabilizing the patient's hemodynamic status [1,2]. Massive transfusion protocols serve as a cornerstone in the management of critically ill patients with severe bleeding, aiming to restore blood volume and effectively address coagulopathy [3-6]. However, administration of blood products is not without risks, potentially leading to complications such as transfusion reactions, volume overload, and electrolyte imbalances [3].The management of hemorrhage in critical care settings involves a multifaceted approach, including strategies to manage coagulopathy,

continuous monitoring of coagulation status, and use of pharmacological agents to correct hemostatic abnormalities [2,4]. Despite these established protocols, significant variations exist in their implementation, particularly in obstetric emergencies, such as placenta previa totalis, where massive hemorrhage is a frequent complication [3,7]. This variability underscores the need for tailored therapeutic strategies to optimize patient outcomes. This case report presents the management of a critically ill patient admitted to the ICU following an emergency cesarean section for antepartum hemorrhage secondary to placenta previa totalis. The objective of this report was to elucidate the diagnostic process, therapeutic interventions, and complications encountered in managing a pregnant patient with massive hemorrhage, thereby contributing to the existing body of knowledge on this challenging clinical scenario.

CASE DESCRIPTION

A 35-year-old woman, gravida 2 para 1 abortus 0 (G2P1A0), presented with 27–28-week gestation complicated by antepartum hemorrhage due to placenta previa totalis, severe preeclampsia, and HELLP syndrome. The patient, weighing 60 kg with a height of 160 cm, experienced massive vaginal bleeding estimated at eight sanitary pads, accompanied by severe abdominal pain and uterine contractions. Her antenatal care history revealed severe preeclampsia diagnosed at 24 weeks of gestation (blood pressure, 140/100 mmHg; proteinuria), which was managed with methyldopa 500 mg twice daily. Initial management by a midwife included intravenous fluids (Ringer's lactate 2000 cc and 0.9% NaCl 500 cc); however, persistent bleeding necessitated referral to Dr. Hasan Sadikin Hospital.

Table 1. Laboratory and Hemodynamic Parameters During ICU Stay

Parameter	Admission	Day 1 ICU	Day 2 ICU	Day 3 ICU	Day 4 ICU
Hemoglobin (g/dL)	4.4	5.1	7.7	8.6	10.1
Hematocrit (%)	18.2	15.7	22.5	-	-
Platelets (x10^3/µL)	90	57	103	115	155
Urea (mg/dL)	34.4	35.6	64	69.8	-
Creatinine (mg/dL)	1.93	2.08	1.91	1.5	-
Albumin (g/dL)	2.35	1.92	-	2.32	-
Prothrombin Time (PT) (seconds)	19.7	34.1	12.1	-	-
International Normalized Ratio (INR)	1.42	2.1	1.2	-	-
Blood Pressure (mmHg)	78/45	80–90/40–50	120–130/65–80	135–140/77–86	120–130/80–90
Heart Rate (bpm)	135	110–120	90–110	80–110	80–88
SpO2 (%)	94	99	99	97–98	-

Upon arrival at the emergency department, the patient was in critical condition: Glasgow Coma Scale (GCS) 12, blood pressure, 78/45 mmHg; heart rate, 135 beats/min; respiratory rate, 32 breaths/min; and oxygen saturation, 94% on a simple mask with 5 L/min oxygen. She exhibited cold extremities and a capillary refill time >2 s. Bedside ultrasound confirmed placenta previa totalis with complete coverage of the cervical os and intrauterine fetal death. Laboratory results indicated severe anemia (hemoglobin 4.4 g/dL), thrombocytopenia (platelets, 90,000/µL), elevated liver enzyme levels (SGOT, 108 U/L; SGPT, 127 U/L), and renal impairment (urea 34.4 mg/dL, creatinine 1.93 mg/dL). Initial resuscitation with 1000 cc Ringer's lactate and 1000 cc gelofusin was initiated, followed by an emergency cesarean section. Preoperatively, two units of packed red cells (PRC) were transfused.

The 1.5-hour surgery resulted in 3000 cc intraoperative blood loss. Intraoperative management included 2000 cc of crystalloids, 1000 cc of colloids, 5 units of PRC (1000 cc), 2 units of fresh frozen plasma (FFP, 600 cc), and 4 units of platelets (200 cc). Hemodynamics remained unstable, with systolic blood pressure ranging from 70–90 mmHg supported by norepinephrine (0.05–0.1 mcg/kg/min), urine output of 100–50 cc, heart rate 102–121 beats/min, and SpO2 94–99%. Postoperatively, the patient was admitted to the ICU on mechanical ventilation. On day 1, pulmonary edema, stage 2 acute kidney injury (AKI), and hypoalbuminemia (albumin

1.92 g/dL) developed and were managed with furosemide. Echocardiography showed normal cardiac function (LVEF 60–65%) with no pericardial effusion.

Table 2. Fluid Balance During ICU Stay

Day	Input (mL)	Output (mL)	Balance (mL)
Day 1	Infusion: 3500, Drugs: 500, Transfusion: 1500	Urine: 1150, Drain: 0, Blood Loss: 100	+4250
Day 2	Infusion: 2000, Drugs: 500, Transfusion: 250	Urine: 3600, Drain: 0, Blood Loss: 0	-950
Day 3	Infusion: 1000, Drugs: 500, Transfusion: 0	Urine: 2800, Drain: 0, Blood Loss: 0	-1400
Day 4	Infusion: 1000, Drugs: 500, Transfusion: 0	Urine: 1600, Drain: 0, Blood Loss: 0	-200

By day 2, the respiratory status improved (SpO2 99% in PSV mode), and hemodynamic stability was achieved (blood pressure 120–130/65–80 mmHg, norepinephrine discontinued). Furosemide was titrated (3–10 mg/h) to maintain fluid balance. Extubation was performed on day 3, with normalization of laboratory parameters (hemoglobin 8.6 g/dL, platelets 115,000/µL, creatinine 1.5 mg/dL). The patient was transferred to the high-care unit on day 4, with stable vital signs (blood pressure 120–130/80–90 mmHg) and resolved pulmonary edema on chest radiography.

DISCUSSION

Hemorrhagic shock is a life-threatening condition characterized by significant blood loss leading to reduced tissue perfusion and oxygen supply. This results in a shift from aerobic to anaerobic metabolism that generates lactate and causes metabolic acidosis. In this case, the patient presented with Class III hemorrhagic shock, marked by hypotension, tachycardia, and altered consciousness. Prompt fluid resuscitation effectively stabilized the patient's blood pressure and heart rate. This aligns with the established guidelines for managing hemorrhagic shock, emphasizing the importance of early intervention to prevent organ failure and death [8-10].

Placenta previa, identified in this case, is a major risk factor for obstetric hemorrhage and requires cesarean delivery to prevent maternal and fetal morbidity. The condition was complicated by heavy bleeding, necessitating emergency surgery following the damage control principles. Hemodynamic stabilization and coagulopathy correction were prioritized before proceeding with the definitive surgery. The approach followed here is consistent with recommendations for managing life-threatening obstetric hemorrhages, focusing on stabilizing the patient before conducting definitive procedures [11-13].

The management of massive blood transfusion in this patient highlights potential complications, including metabolic disturbances, coagulopathy, and immunologic reactions. Citrate-induced hypocalcemia, hyperkalemia, and dilutional coagulopathy are critical risks requiring careful monitoring. In this case, transfusions of red blood cells, fresh frozen plasma, and platelets were necessary to restore circulatory volume and correct coagulopathy, following a 1:1:1 ratio for balanced resuscitation [14-16].

Acute kidney injury (AKI), triggered by hemorrhagic shock and worsened by preeclampsia and HELLP syndrome, is another significant complication in this case. The patient's condition met the criteria for AKI Stage 2 with oliguria and elevated creatinine levels. Management focuses on optimizing renal perfusion and fluid balance. Aggressive fluid resuscitation along with vasopressors was employed to maintain adequate renal perfusion pressure [17-20].

Hypoalbuminemia, observed in this case, is common in critically ill patients and can worsen the prognosis by increasing the risk of edema and respiratory complications. The hypoalbuminemia observed here was likely due to increased vascular permeability and impaired albumin synthesis associated with the underlying conditions. While the use of albumin infusion remains controversial, it can be considered in cases of significant edema or hemodynamic instability [21,22].

Antibiotic therapy with ceftriaxone and metronidazole was initiated to cover a broad spectrum of bacterial pathogens, including anaerobes, which are common in obstetric infections. This aligns with the standard practice for high-risk obstetric hemorrhage, where prophylactic antibiotic therapy is crucial to prevent infections such as endometritis or sepsis [23-25].

This case underscores the importance of a multidisciplinary approach for managing critically ill obstetric patients, with a focus on rapid stabilization, addressing underlying pathophysiological issues, and preventing further complications through targeted interventions.

CONCLUSION

In pregnant patients with trauma and massive hemorrhage, early diagnosis, damage control surgery, and appropriate massive transfusion management are critical interventions required to save the patient's life.

DECLARATIONS

None

CONSENT FOR PUBLICATION

The Authors agree to be published in the Journal of Society Medicine.

FUNDING

None

COMPETING INTERESTS

The authors declare no conflicts of interest in this case report.

AUTHORS' CONTRIBUTIONS

All authors made substantial contributions to the case report. All authors was responsible for patient management, data collection, and the initial drafting of the manuscript. All authors reviewed and approved the final version of the manuscript, ensuring its accuracy and integrity and being accountable for all aspects of the work.

ACKNOWLEDGMENTS

None

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