Original Article

Postpartum Haemorrhage: A Case Series Highlighting Diverse Clinical Profiles and Evolving Management Strategies in a Tertiary Care Setting

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Abstract

Background: Postpartum haemorrhage (PPH) has long remained one of the most dreaded emergencies in obstetrics. Although numerous risk factors have been identified, PPH can unpredictably occur in any labouring woman, transforming an otherwise uneventful delivery into a life-threatening situation. Despite the availability of multiple pharmacological and surgical options, PPH continues to be a leading cause of maternal morbidity and mortality worldwide. **Case Description:** As a tertiary health-care centre, we receive numerous referrals from peripheral facilities with varied presentations and stages of PPH. In this study, we present a series of such cases, highlighting the diversity in clinical manifestations and the tailored multimodal interventions employed to prevent long-term morbidity and mortality. Our experience underscores the importance of timely decision-making, individualised treatment strategies, and a multidisciplinary approach in improving maternal outcomes in PPH. **Conclusion:** With advancements in medical science, several uterotonic agents and interventional procedures—such as SR cannula (Samantha Ram cannula), balloon tamponade, uterine devascularization, compression sutures, and, as a final resort, peripartum hysterectomy—have expanded the armamentarium against PPH. Selection of the appropriate management strategy is guided by the patient's clinical profile, the type and severity of haemorrhage, and laboratory parameters.

Keywords: Postpartum haemorrhage, SR cannula, maternal morbidity.

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Introduction

Postpartum haemorrhage (PPH) remains the leading direct cause of maternal mortality and morbidity worldwide, contributing to nearly 25% of global maternal deaths and as high as 30–38% in India.[1,2] Classically, PPH is defined as blood loss exceeding 500 mL following vaginal birth or more than 1,000 mL after caesarean section; however, any degree of blood loss that compromises maternal hemodynamics or alters her clinical condition must be treated as PPH. It may be categorised as primary (within 24 hours of delivery) or secondary (between 24 hours and 12 weeks postpartum).[3]

The aetiology is conveniently summarised by the "4 Ts": Tone (uterine atony), Trauma (genital tract injury, uterine rupture, or inversion), Tissue (retained placental products), and Thrombin (coagulation disorders). Delayed detection and late escalation of care remain critical determinants of poor outcomes. The recent E-MOTIVE trial (2023) underscored the importance of calibrated blood loss measurement and an immediate bundled response protocol in significantly reducing severe maternal morbidity.[4] In the Indian context, additional vulnerabilities—including high rates of anaemia, multiparity, limited antenatal care, and delays in referral and transportation—further amplify the risk of adverse outcomes.[2]

Given the unpredictable and rapidly progressive course of PPH, prompt, stepwise management is imperative, beginning with uterotonic agents, followed by mechanical tamponade, and escalating to devascularization procedures, compression sutures, or hysterectomy when clinically warranted.[5]

This case series presents seven patients with PPH managed at our tertiary care facility. Written informed consent was obtained from all participants after ensuring confidentiality, and approval from the Institutional Ethics Committee was secured. The clinical characteristics, management strategies, and outcomes of all cases are detailed in the table below.

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Table 1: Case Series

Case	Type of PPH	Profile	Management/Remarks
1	Primary Atonic	P1L1, Blood loss ~900 mL	Uterine Massage, Uterotonics Tranexamic acid, 2 PCV
2	Primary Atonic	P1L1, Blood loss ~1200 mL	Stepwise uterotonic therapy was administered along with Tranexamic acid. An SR cannula was placed intrauterine and maintained for 10 minutes to create negative pressure, resulting in the collapse of the endometrial cavity and successful control of haemorrhage. Blood component therapy included transfusion of 3 units of packed red cells and 9 units of cryoprecipitate.
3	Primary Traumatic (cervical tear)	P1L1, PPD1, referred from periphery	Cervicovaginal Exploration under GA + cervical tear repair + packing
4	Primary Atony leading to Acute Uterine Inversion	P2L2, PPD1, referred from another centre, was received in a state of shock. On examination, the uterine fundus was found at the introitus, with an estimated blood loss of approximately 1000 ml.	The patient underwent the Johnson manoeuvre, involving manual reposition of the atonic uterine fundus under anaesthesia, followed by continuous uterine massage to restore uterine tone. Uterotonic agents, Tranexamic acid, and inotropic support were instituted as clinically indicated in view of the shock state. Blood transfusion was administered to compensate for acute blood loss. Owing to the severity of her condition, admission to the intensive care unit was required for 2 days.
5	Primary atony	P1L2, Twin delivery referred case	Initial management included administration of uterotonic agents, followed by placement of an SR cannula intrauterine in an attempt to control haemorrhage. As bleeding persisted despite these measures, a decision was made to proceed with laparotomy. Intraoperatively, bilateral uterine artery ligation was performed, followed by application of uterine compression sutures to achieve hemostasis [Figure 1].
6	Primary Traumatic with Uterine Rupture	P2L2, referred case	An emergency laparotomy was performed for a ruptured uterus. In view of the extensive uterine defect and ongoing massive haemorrhage, an obstetric hysterectomy was required to achieve definitive control of bleeding. The patient required transfusion of blood and blood products for hemodynamic stabilisation and was subsequently managed in the intensive care unit for 3 days.
7	Primary Traumatic Broad ligament hematoma post-LSCS	P2L1, referred case of outside LSCS	The patient was received with marked abdominal distension, severe anemia, abdominal pain, and progressively worsening hemodynamic instability, necessitating an emergency laparotomy. Intraoperatively, a large broad ligament hematoma (Figure 2) associated with massive hemoperitoneum was identified. An obstetric hysterectomy with bilateral internal iliac artery ligation (Figure 3) was performed to achieve hemostasis. The patient required massive transfusion of blood and blood products, followed by a prolonged stay in the intensive care unit for postoperative management.

PPD: previous postpartum death
GA: General Anaesthesia
P1L1: Parity one, Living one
LSCS: Lower Segment Cesarean Section
ICU: Intensive Care Unit
PCV: Packed Cell Volume.

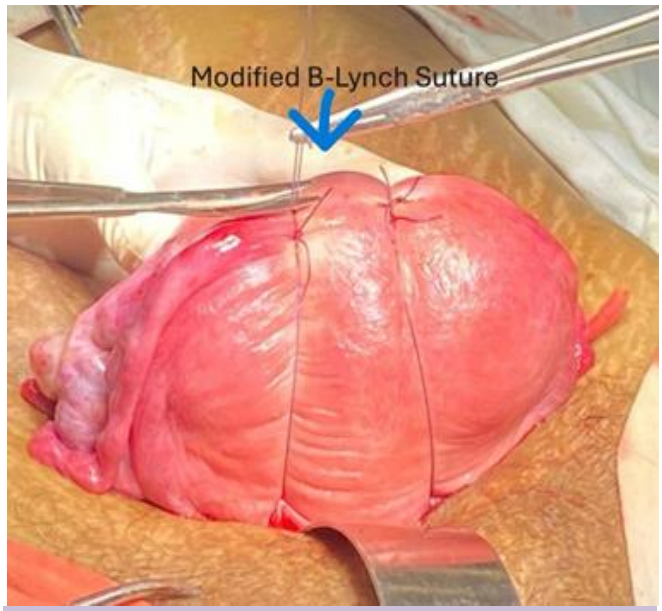

Figure 1: Modified B-Lynch suture

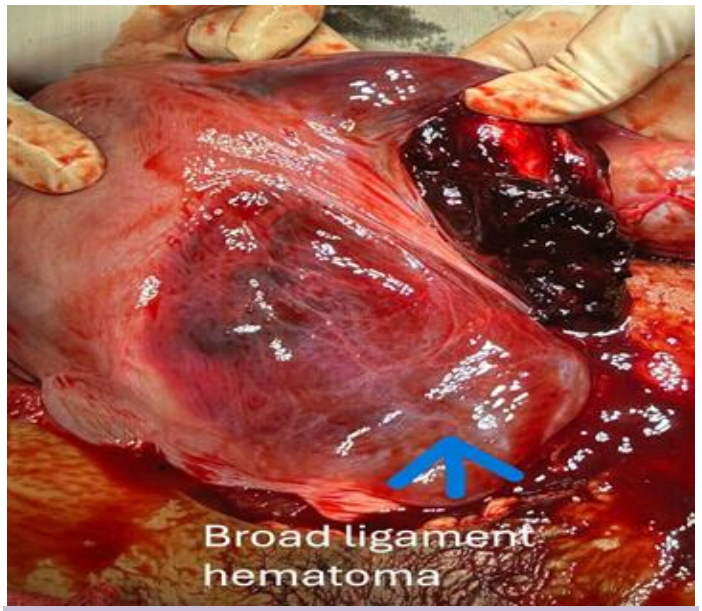

Figure 2: Broad ligament hematoma

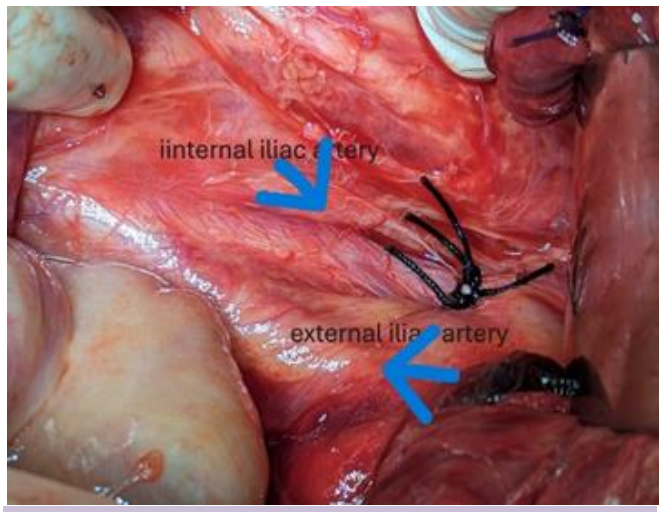

Figure 3: Internal iliac artery ligation

Discussion

This case series reflects the heterogeneity of postpartum haemorrhage and reinforces the critical need for aetiology-directed escalation rather than a uniform approach. The Key to success is the accurate identification of the source of haemorrhage. Clinical judgement prevails over radiological and laboratory tools, which are complementary, not replacements. Management in all patients began with prompt administration of uterotonics and tranexamic acid, along with uterine massage, oxygen supplementation, strict input–output monitoring, and aggressive fluid and blood product resuscitation. Once medical measures were exhausted, second-line interventions such as the SR cannula and uterine packing were employed. Persistent or rapidly deteriorating haemorrhage warranted major surgical procedures, including pelvic devascularization, compression sutures, and peripartum hysterectomy. One instance of uterine inversion was successfully managed with timely manual repositioning, demonstrating the lifesaving value of early diagnosis before uterotonic administration.

Aetiology-specific responses further emphasised targeted decision-making:

- Tone (Atony): Cases 1, 2, and 5 responded to stepwise uterotonic escalation and the SR cannula technique; refractory bleeding necessitated laparotomy, vessel ligation and compression sutures.
- Trauma: Cases 3, 6, and 7 highlighted the indispensability of meticulous examination for genital tract tears and concealed bleeding, including haematoma and uterine rupture.
- Inversion: Case 4 illustrated that rapid uterine repositioning (Johnson manoeuvre) before uterotonics is pivotal in preventing irreversible haemodynamic collapse.

Across cases, four elements consistently emerged as determinants of success:

1. Preparedness and early recognition: Underestimation of blood loss remains a major cause of treatment delay. Quantitative blood loss (QBL) assessment using calibrated drapes and early-warning indices such as the Shock Index significantly improves detection.[5,7]
2. Individualised escalation pathways: Not all patients respond to uterotonics; failure to escalate rapidly to balloon tamponade or surgical intervention increases mortality risk. A structured, stepwise algorithm prevents delay and reduces morbidity.[6]
3. Multidisciplinary coordination: Synchronisation between obstetricians, anaesthetists, the blood bank, ICU, and nursing teams was fundamental to survival.[7]
4. Role of TXA: Timely administration of tranexamic acid—ideally within the first 3 hours—substantially reduces mortality by mitigating fibrinolysis.

Despite the severity of haemorrhage in this cohort, all seven patients survived, reflecting the impact of comprehensive bundled care and timely escalation. Massive haemorrhage frequently triggers coagulopathy and disseminated intravascular coagulation (DIC), necessitating aggressive correction using packed red cells, platelets, fresh frozen plasma, cryoprecipitates, and, in selected cases, recombinant factor VIIa. It is important to recognise that nearly 20% of PPH cases occur in women with no identifiable risk factors, and therefore vigilance is essential in every delivery.[8]

Several known risk factors—including preeclampsia, multiple gestation, fetal macrosomia, prolonged or augmented labour, maternal obesity, and primiparity—are highly relevant to the Indian population and further increase susceptibility.[9] Consistent with global evidence, our study found the SR cannula to be an effective intermediate measure, reducing the need for laparotomy when applied early.

PPH remains a time-critical obstetric emergency in which minutes define survival. This case series demonstrates that optimal outcomes arise from a combination of readiness, rapid etiological identification, protocol-driven escalation, and a coordinated multidisciplinary response. Integrating WHO/FIGO-recommended practices—especially QBL monitoring, first-response bundles, early TXA use, and structured transition from medical to mechanical and surgical modalities—can dramatically reduce maternal morbidity and mortality. Strengthening these principles across both tertiary and peripheral health facilities remains essential in safeguarding maternal health.

The findings underscore the importance of universal adoption of WHO/FIGO-endorsed protocols—including quantitative blood loss assessment, standardised first-response bundles, early administration of tranexamic acid (TXA), and a structured stepwise progression from medical to mechanical and surgical interventions. Strengthening these practices, particularly in high-burden regions, has the potential to markedly reduce maternal morbidity and mortality and improve long-term reproductive health outcomes.

Clinical significance

This case series highlights that favourable outcomes in postpartum haemorrhage hinge not only on the availability of therapeutic modalities but, more importantly, on preparedness and timely action. Early recognition of excessive bleeding, prompt escalation tailored to the patient's clinical status, and seamless multidisciplinary coordination are crucial in preventing rapid deterioration.

Conclusion

Postpartum haemorrhage remains a rapidly evolving obstetric emergency requiring immediate recognition, timely escalation, and coordinated multidisciplinary management. This case series highlights the diverse clinical spectrum of PPH and underscores the importance of an aetiology-directed approach tailored to the underlying cause. Early institution of first-line measures, judicious use of mechanical and surgical interventions, and adherence to standardised WHO/FIGO-recommended protocols were pivotal in achieving favourable maternal outcomes in all cases. Strengthening preparedness, ensuring prompt access to blood products and critical care, and promoting protocol-based management across all levels of healthcare are essential to reducing maternal morbidity and mortality associated with PPH.

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Conflicts of interest

There are no conflicts of interest.

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