

Uterine Inversion: A Rare Obstetric Emergency: Case Report and Review

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ABSTRACT

Background: Acute uterine inversion is a rare but life-threatening obstetric emergency. Hypovolemic shock and massive hemorrhage are the main warning signs. Early recognition and prompt management are crucial to reducing maternal morbidity and mortality. **Case:** A 31-year-old woman was referred to the Emergency Department of Zainoel Abidin Hospital from a maternity hospital with decreased consciousness two days after vaginal delivery at a primary health center. The patient presented with uterine inversion and experienced cardiac arrest, requiring cardiopulmonary resuscitation with return of spontaneous circulation (ROSC). She also had a fourth-degree perineal rupture and underwent a subtotal hysterectomy due to uterine atony. **Discussion:** Uterine inversion should be promptly recognized during the third stage of labor. In primary health facilities without operative capability, manual reposition supported by tocolytic administration can be effective. Aggressive and immediate treatment of shock is essential, as it is a major determinant of maternal outcome. **Conclusion:** The management of acute uterine inversion focuses on rapid hemodynamic stabilization and timely uterine reposition. Appropriate interventions can significantly reduce maternal morbidity and mortality.

Keywords: uterine inversion; obstetric emergency; postpartum hemorrhage; shock.

INTRODUCTION

Maternal mortality remains a significant global health concern, with hemorrhage, hypertension, and infection being the three leading causes of maternal death. In the United States alone, more than 7,000 pregnancy-related deaths were reported between 2006 and 2015, with hemorrhage accounting for approximately 11% of these cases as the direct cause. Globally, postpartum hemorrhage (PPH) is recognized as the leading single cause of maternal mortality. It is estimated that nearly one-third of severe hemorrhage cases could potentially be prevented.¹

Postpartum hemorrhage is defined as blood loss greater than 500 mL following the third stage of labor. This definition, however, poses a challenge, as nearly half of women delivering vaginally may lose that amount when measured accurately, and almost one-third of women undergoing cesarean delivery may experience blood loss exceeding 1000 mL.²

Among the life-threatening causes of postpartum hemorrhage is uterine inversion, a rare but classical obstetric emergency. If not promptly diagnosed and treated, uterine inversion often leads to massive hemorrhage and profound hypovolemic shock. The reported incidence varies widely, from 1 in 5,000 to 1 in 20,000 deliveries, with maternal mortality ranging between 12% and 25%.³

CASE REPORT

A 31-year-old woman with G3P2A0 was referred to the Emergency Department of Dr. Zainoel Abidin General Hospital from a maternity hospital with decreased consciousness. She had delivered a 3300-gram infant via spontaneous vaginal delivery two days earlier at a primary health center, complicated by uterine inversion. Labor progression had been normal according to the partograph. The patient subsequently developed cardiac arrest and decreased consciousness, and upon arrival at the maternity hospital, she underwent cardiopulmonary resuscitation, achieved return of spontaneous circulation (ROSC), and was placed on mechanical ventilation.

On examination, a fourth-degree perineal rupture was identified. The patient underwent laparotomy with subtotal hysterectomy due to uterine atony, as well as perineorrhaphy for the perineal rupture. She received a transfusion of 7 units of packed red cells, 5 units of fresh frozen plasma, and 3 units of thrombocyte concentrate. Her obstetric history revealed two prior uncomplicated vaginal deliveries. She had attended regular antenatal care visits with no abnormalities detected. Laboratory results on June 9, 2023, showed hemoglobin 5.3 g/dL (normochromic, normocytic), platelet count $55 \times 10^3/\mu\text{L}$, blood urea nitrogen 121 mg/dL, and creatinine 5.6 mg/dL.

At the emergency department, the patient was in a comatose state with blood pressure 100/67 mmHg, pulse rate 80 beats/min and weak respiratory rate 20 breaths/min, temperature 36.6 °C, and oxygen saturation 99%. She appeared pale with cold extremities, conjunctival pallor, and no evidence of active bleeding from the surgical site.

DISCUSSIONS

Uterine inversion is a rare but life-threatening obstetric emergency with high maternal mortality if not recognized and managed promptly. Errors in the management of the third stage of labor are considered among the most common and important contributing factors. Easterday et al. reported that at least 40% of cases occurred in patients with a normally implanted placenta, while Henderson and Alles noted in their review of 24 cases that the highest incidence was observed in primiparous women, suggesting possible predisposing factors.³

Postpartum hemorrhage (PPH) remains one of the leading causes of maternal mortality worldwide, accounting for nearly 11% of maternal deaths in the United States between 2006 and 2015, and even higher proportions globally. According to the American College of Obstetricians and Gynecologists (2017), PPH is currently defined as cumulative blood loss ≥ 1000 mL accompanied by signs and symptoms of hypovolemia within 24 hours of delivery, regardless of the mode of delivery.⁴ Although this threshold was revised to improve recognition, blood loss exceeding 500 mL after vaginal delivery should still be considered abnormal and warrant early intervention. Primary PPH occurs within 24 hours postpartum and is most commonly caused by uterine atony, genital tract lacerations, retained placenta, uterine inversion, abnormal placentation, or coagulopathies. Secondary PPH, occurring from 24 hours to 12 weeks postpartum, is usually associated with retained products of conception, infection, subinvolution of the placental site, or coagulation disorders.⁵

The pathophysiology of uterine inversion involves acute disruption of uterine support at the placental implantation site.¹ Risk factors include fundal placental implantation, uterine atony, premature or excessive cord traction, abnormal placental adherence (e.g., placenta accreta), short umbilical cord, uterine wall weakness, intrauterine tumors, and excessive fundal pressure.⁷ Clinically, patients may present with massive hemorrhage, hypovolemic shock, severe pain, absence of a palpable uterine fundus on abdominal examination, and a large vaginal mass. Incomplete inversion may be mistaken for other pelvic masses, such as a uterine myoma, and ultrasonography can be helpful in diagnosis.

The incidence of uterine inversion is estimated between 1 in 5,000 and 1 in 20,000 deliveries, but outcomes can be catastrophic. Maternal mortality has been reported to range between 12% and 25%, particularly in resource-limited settings where recognition and intervention are delayed.¹⁰ In high-

resource countries, improved resuscitation, transfusion protocols, and surgical management have reduced mortality, but the condition still represents a major contributor to preventable maternal deaths.¹¹

Complete uterine inversion is often recognized quickly due to its dramatic presentation, but partial inversion can be misdiagnosed, delaying treatment. Ultrasonography has been described as a useful adjunct in such cases, particularly when distinguishing partial inversion from prolapsed fibroids or other pelvic masses. Brar et al. reviewed 56 cases of uterine inversion and reported an average blood loss of 2500 mL, with one-third of patients presenting in hypovolemic shock. They also noted that premature placental separation often exacerbates blood loss.⁸

Management of uterine inversion is based on two essential components: immediate resuscitation for hemorrhagic shock and prompt uterine reposition. First-line measures include establishing large-bore intravenous access, rapid fluid resuscitation, blood transfusion, and preparation for anesthesia. Manual reposition (Johnson's maneuver) is attempted by applying upward pressure on the inverted fundus along the vaginal axis (Figure 1). If the placenta remains attached, reposition should initially be attempted without removal, as placental detachment may exacerbate bleeding. Intravenous tocolytics (e.g., terbutaline, nitroglycerin, or magnesium sulfate) can facilitate uterine relaxation. Once the uterus is restored, uterotonic agents such as oxytocin and ergometrine are administered to prevent recurrence and control atony. If manual reposition fails due to a constriction ring, surgical approaches such as laparotomy (Huntington or Haultain procedure) may be required.¹ In refractory cases or when uterine atony persists with uncontrollable hemorrhage, hysterectomy may be lifesaving, as in this patient.



FIGURE 1: Manual reposition of uterine inversion after placental separation by applying upward pressure on the inverted fundus.



FIGURE 2: Bimanual uterine compression for atony, with one hand in the anterior fornix and the other on the abdomen performing fundal massage.

In the present case, the patient developed complete uterine inversion during vaginal delivery at a primary health center, most likely related to improper third-stage management. She subsequently deteriorated into hypovolemic shock and cardiac arrest, necessitating resuscitation, hysterectomy, and hemodialysis for acute kidney injury due to prerenal hypoperfusion. This case underscores the importance of early recognition and aggressive management.

This case underscores several important clinical lessons: (1) adherence to safe third-stage labor practices is critical to prevention; (2) early recognition of uterine inversion can reduce delays in management; (3) resuscitation and multidisciplinary care are essential for survival; and (4) timely referral from primary facilities to tertiary centers can reduce maternal morbidity and mortality. Delay beyond 48 hours is associated with a significant increase in mortality, emphasizing the importance of urgent diagnosis and treatment.^{8,9}

CONCLUSION

Uterine inversion is a rare but potentially fatal obstetric emergency that requires early recognition and rapid intervention. Immediate resuscitation and prompt uterine reposition are the cornerstones of management, while surgical intervention may be necessary in refractory cases. This case highlights the importance of proper third-stage labor management at primary health facilities, as well as the critical role of timely referral and multidisciplinary care in reducing maternal morbidity and mortality.

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