



Combined Spinal-Epidural Placement: Unmasking Spontaneous Uterine Rupture in a Minimal-Risk Patient

Sean Raveai, MS-III¹, Noah Griffin, MS-III¹, Amit Aggarwal, DO¹, Allison Mullins, MD¹, Michael Cook, MD¹
¹Department of Anesthesiology - University of Texas Medical Branch, Galveston, TX



Background

- Spontaneous uterine rupture is a rare but serious complication associated with risk factors, such as prior uterine surgery, smoking history, trauma, high parity, and uterine abnormalities. This case presents an unusual occurrence of uterine rupture in a low-risk patient, emphasizing the significance of vigilance even in patients without the typical predisposing factors.
- From an anesthetic standpoint, spontaneous uterine rupture poses significant challenges due to its potential to cause rapid hemodynamic instability, massive blood loss, and fetal compromise. The consequences that can occur from such challenges include abrupt maternal hypotension, hypovolemic shock, fetal bradycardia or demise due to disrupted placental circulation, and the risk of disseminated intravascular coagulation (DIC). Airway challenges and respiratory compromise may also arise as a result of shock, rapid fluid shifts, or acidosis, further complicating management.
- Our objective is to examine the role of anesthetic management in detecting complications like uterine rupture, with specific attention to hemodynamic shifts during Combined Spinal-Epidural (CSE) and their implications in obstetric care. Additionally, this analysis highlights strategies for emergent anesthetic management, volume resuscitation, invasive monitoring, and implementation of massive transfusion protocols, to optimize maternal and fetal outcomes in such critical scenarios.

Case Presentation

- **Patient:** 22-year-old, G2P1 at 39 weeks gestation, presenting for induction of labor. Minimal risk factors identified, including no history of smoking, prior intrauterine complications, with 1 previous vaginal pregnancy and delivery. No prior surgeries or uterine trauma. The patient does have a history of anemia and sickle cell trait.
- **Procedure:** 1st attempt was epidural placement, but was difficult due to severe contractional pain. Combined Spinal-Epidural technique initiated upon patient's request for epidural.
- **Medications:** Administered 0.5 cc of 0.5% bupivacaine with fentanyl 0.3 cc intrathecally, resulting in immediate analgesia. Ropivacaine 0.2% was initiated at a rate of 10 mL/hr with a PCEA bolus of 4 mL administered as a clinician bolus.
- **Hemodynamic Changes:** +16 minutes after the CSE test, maternal blood pressure dropped significantly, followed by a rapid decline in fetal heart rate. +28 minutes later, terbutaline was administered. Maternal blood pressure stabilized promptly; however, fetal distress persisted despite resolution of maternal hypotension, necessitating an emergency C-section.
- **Operative Findings:** During the C-section, a spontaneous uterine rupture was identified, which was unexpected given Pt's minimal risk profile. The patient was given 1 unit of packed RBCs intraoperatively due to the need for extensive repairs, and an additional unit of packed RBCs due to maternal tachycardia. The patient did not require any vasopressor agents nor was converted to general anesthesia throughout the procedure.
- **Postoperative Course:** The patient reported mild abdominal pain postoperatively, which resolved without complication. Recovery proceeded uneventfully. The neonate showed no signs of ongoing or long-term fetal distress, with reassuring Apgar scores and normal postnatal adaptation.



Figure 1. Postoperative Uterus Rupture Repair



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Teaching Points

- CSE's cause maternal hypotension because of a rapid-onset sympathetic blockade. This subsequently results in peripheral vasodilation, decreased venous return, and reduced cardiac output, thus ultimately resulting in the hypotension. If the hypotension persists after attempting to correct for it with fluids and vasopressors, it can potentially reveal underlying complications like uterine rupture or placental abruption. Since normally the hypotension induced by CSE is transient and not as severe, if there is a concurrent obstetric emergency the hypotension will significantly worsen due to maternal internal bleeding and disrupted uteroplacental circulation.
- CSE's are more indicated for high-risk obstetric patients, such as patients with cardiovascular disease for titration of the sympathetic blockade, difficult spinal placements secondary to anatomy or obesity, and labor analgesia for more immediate relief. The potential side effects of pruritus, urinary retention and fetal heart rate abnormalities could maybe occur more frequently with CSE's.
- Careful monitoring during CSE is incredibly important, as unexpected hemodynamic shifts can indicate rare complications, even in low-risk patients. It is necessary to explore anesthetic techniques and doses to improve safety and outcomes in diverse obstetric cases. This case highlights the essential role of anesthesiologists in maintaining vigilance, facilitating early diagnosis, and coordinating rapid response during labor and delivery.