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CASE REPORT

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Concurrent intraoperative uterine rupture and placenta accreta. Do preoperative chronic hypertension, preterm premature rupture of membranes, chorioamnionitis, and placental abruption provide warning to this rare occurrence?

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Abstract

Uterine and placental pathology can be a major cause of morbidity and mortality in the parturient and infant. When presenting alone, placental abruption, uterine rupture, or placenta accreta can result in significant peripartum hemorrhage, requiring aggressive surgical and anesthetic management; however, the presence of multiple concurrent uterine and placental pathologies can result in significant morbidity and mortality. We present the anesthetic management of a parturient who underwent an urgent cesarean delivery for non-reassuring fetal tracing in the setting of chronic hypertension, preterm premature rupture of membranes, and chorioamnionitis who was subsequently found to have placental abruption, uterine rupture, and placenta accreta.

Keywords: preterm premature rupture of membranes (PPROM), chorioamnionitis, placental abruption, uterine rupture, placenta accrete, cesarean-hysterectomy

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Introduction

Various placental and uterine pathologies can result in significant peripartum obstetric hemorrhage. Chorioamnionitis, an inflammation of the placenta and maternal decidua, can precipitate placental abruption and lead to post-partum uterine atony [1, 2]. Placental abruption, a disruption between the union of the placenta and endometrium, can have effects that result in hemorrhagic hypovolemia and disseminated intravascular coagulation [3]. In uterine rupture, there is a breach in the wall of the myometrium that can have fatal consequences to the fetus and hemorrhagic sequelae to the mother [4]. A morbidly adherent placenta such as placenta accreta often results in massive intraoperative bleeding that requires aggressive fluid and blood product management and resuscitation [5].

At present, the literature does not reference the presentation and anesthetic management of these aforementioned conditions being concurrently present in one parturient. We present one such patient.

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Case

A 33-year-old Gravida 5 Para 1213 with chronic hypertension presented to the labor and delivery unit with a 2-day history of preterm premature rupture of membranes (PPROM), now at concern for chorioamnionitis and actively contracting at 33 weeks and 6 days gestation. Sterile speculum examination revealed vaginal bleeding. A recent ultrasound performed 1 week prior showed no evidence of abnormal placentation, and the obstetrical team proceeded with careful continuous fetal monitoring with expectant vaginal delivery management.

The anesthesiology service was consulted for labor analgesia management. There were no contraindications to neuraxial anesthesia, and a labor epidural was placed uneventfully; satisfactory labor analgesia was obtained. During continuous electronic fetal monitoring,

repeated variable and late decelerations were observed on fetal tracing. Additionally, the parturient was experiencing increased vaginal bleeding and the decision was made to proceed to the operating room for urgent cesarean delivery due to non-reassuring fetal tracings in the setting of suspected evolving placental abruption.

Upon entering the operating room, American Society of Anesthesiologists monitors were applied, which included a non-invasive blood pressure cuff, an electrocardiogram, and pulse oximetry. Initial vital signs were reassuring, with repeated blood pressures noted to be approximately 120/80 mmHg and maternal heart rate ranging between 115 and 120 bpm. The patient's existing 18-guage intravenous line was noted to be patent and functioning well. The anesthesiology team was confident that the existing labor epidural would be effective for surgical anesthesia, as the patient endorsed sensory changes to ice at T10 bilaterally. An initial 5 mL of preservative-free 2% lidocaine with a 1:200,000 dilution of epinephrine was provided via the labor epidural to obtain surgical anesthesia and a bilateral T4 dermatome analgesic level was obtained swiftly. The patient's vital signs continued to remain stable, and the obstetrical team proceeded with cesarean delivery.

Approach to cesarean delivery was through a Pfannensteil incision. As the surgical team entered the lower uterine segment, a large amount of very foul smelling blood was immediately expelled. The infant was delivered and given to the neonatal team for evaluation; the infant's APGAR scores at minutes 1 and 5 were 7 and 9, respectively. During exteriorization, the uterus was noted to have ruptured in the lower uterine segment inferior to the level of hysterotomy. Additionally, during attempted delivery of the placenta, increased hemorrhage was noted during extraction and it was immediately apparent that the patient had a concurrent placenta accreta.

A massive transfusion protocol was ordered immediately and the anesthesiology team placed additional intravenous access lines and began invasive monitoring. Aggressive intravenous fluid replacement was initiated and a right radial 20-guage arterial line was placed. A one-time dose of ephedrine 10 mg IV push was provided for a brief moment of hypotension. During this time, the obstetrical team had informed the anesthesiology team that the uterine vessels had been identified and controlled. The patient remained hemodynamically stable and mentally alert.

After proximal control of the bleeding had been established by the obstetrics surgical team, the patient's clinical status remained stable. Her hemoglobin as obtained by arterial blood gas was noted to be 8.2 g/dL. The decision was made to proceed with a supracervical hysterectomy, continuing to utilize the patient's labor epidural for surgical anesthesia. An additional preservative-free 2% lidocaine with a 1:200,000 dilution of epinephrine was introduced into the epidural catheter, requiring a total of 12 mL for the duration of the cesarean-hysterectomy. Mild sedation was provided to the patient with midazolam and fentanyl during the case. The rest of the surgery concluded with no other untoward events, and the patient was transferred to the labor and delivery post-anesthesia care unit in hemodynamically stable condition at conclusion of the surgery. There was no need for intraoperative blood product transfusion or aggressive intraoperative vasopressor use; however, the patient did require a blood transfusion on the first postoperative day for postoperative anemia. The remainder of the patient's hospital course was uneventful, and she was discharged on the fifth postoperative day.

Discussion

Proceeding to the operating room to perform an urgent cesarean delivery is a common occurrence on labor and delivery units. Anesthetic management for these situations is dependent on the severity of the clinical presentation of the mother and baby. The presence of concurrent chorioamnionitis, placental abruption, uterine rupture, and placenta accreta is a very rare occurrence and presents significant anesthetic concerns. Our particular patient had a 2-day history of PPROM that predisposed her to chorioamnionitis [1]. In addition, her chorioamnionitis in conjunction with her chronic hypertension increased her risk for placental abruption [1]. Our particular patient's risk factors for uterine rupture were almost non-existent. The classic risk factors for uterine rupture can include prior uterine surgery, trauma, uterine hyperstimulation via pharmacologic induction of labor, and uterine over-distension, of which our patient had none [4]. When evaluated alone, the overall risk of uterine rupture in an unscarred uterus is estimated to be just over 1 of 20,000 [6]. Even in the presence of a previous uterine scar, the incidence is still less than 1% [7]; however, it has been reported in the literature that uterine rupture has occurred in previously unscarred uteri in parturients with increased parity and in women with placental abruption [6,10]. As such, the clinical presentation of a multiparous parturient with chronic hypertension and placental abruption may have precipitated a uterine rupture – despite the patient having an unscarred uterus.

The major risk factors for placenta accreta are related to previous uterine surgery and concurrent placenta previa [5] – neither of which this patient had. The risk of placenta accreta without concurrent previa

is 0.2%, 0.3%, 0.6%, 2.1%, 2.3%, and 7.7% for parturients undergoing their first through sixth cesarean delivery, respectively [8]. For this particular patient presenting with both uterine rupture and placenta accreta, it is possible that the accreta resulted in uterine rupture. There have been case reports of uterine rupture caused by a morbidly adherent placenta [10-12].

Conclusion

We suspect that the patient's multiparous obstetric history coupled with her chronic hypertension and clinical presentation of PPROM and chorioamnionitis with resultant placental abruption may have contributed to this rare occurrence of uterine rupture. The occurrence of uterine rupture in parturients with an unscarred uterus has significant clinical implications as there is a higher fetal mortality and maternal morbidity than in parturients with a previous uterine scar [10, 11]. As such, a higher degree of vigilance might be warranted in multiparous parturients who present with a history of chronic hypertension and PPROM. Given that our patient had an additional diagnosis of chorioamnionitis with placental abruption, a higher degree of clinical suspicion for uterine rupture with appropriate preparations could have been considered. Future population-based research may be able to explore the relationship between chronic hypertension, PPROM, chorioamnionitis, abruption, and uterine rupture.

The question remains whether the patient's initial clinical presentation could have raised suspicion for placenta accreta. A population-based study of placenta accreta showed no association of chorioamnionitis and placenta accreta (OR 0.83, CI 0.28-2.78, $P = .83$) [13]. Because this patient did not have placenta previa, she had a 0.2% chance of placenta accreta and further work-up for placenta accreta would not necessarily have been warranted [8]. We believe the finding of placenta accreta was a separate pathology that would only have been diagnosed intraoperatively. Although the classic risk factors of uterine rupture and placenta accreta were not necessarily present in our patient, we experienced a very rare presentation of these concurrent pathologies. Intraoperative surgeon skill, coupled with close communication and rapid action among the obstetrical, nursing, and anesthesiology teams facilitated a safe cesarean delivery with no poor outcomes for either mother or baby.

Conflict of interest

Nothing to declare

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