

Anaphylactoid Syndrome After Intrauterine Pressure Catheter Placement

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BACKGROUND: Anaphylactoid syndrome of pregnancy is a rare and poorly understood complication of pregnancy. Intrauterine pressure catheter placement is a procedure routinely performed in labor and delivery that is traditionally associated with few complications.

CASE: A pregnant woman at term experienced anaphylactoid syndrome of pregnancy associated with cardiopulmonary failure, disseminated intravascular coagulation, and neurologic sequelae immediately after the placement of an intrauterine pressure catheter. Ultimately, the patient returned to a near-normal level of function, whereas the infant died of pneumonia at 10 months of age.

CONCLUSION: Anaphylactoid syndrome of pregnancy is a rare complication of intrauterine pressure catheter placement. It is important to be prepared for unexpected emergencies, even with such a routine procedure.

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Anaphylactoid syndrome of pregnancy, previously known as amniotic fluid embolism, accounts for 5–18% of all maternal deaths worldwide.¹ Although this syndrome was first reported in Brazil in the early 1920s, the cause and pathogenesis remain largely a mystery. Research in this area is difficult due to the rarity of the condition, its unpredictable occurrence, and the rapidity of maternal decline. The incidence is reported to range from 1:8,000 to 1:80,000 pregnancies, with maternal mortality ranging from 26% to 86%.² Fewer than 15% of survivors are without neurologic injury.³

Intrauterine pressure catheter insertion is a procedure routinely performed in the labor and delivery department. Intrauterine pressure catheters have been linked causally to abruptio placentae and are infrequently associated with uterine perforation, placental vessel perforation, and endometritis,² but have traditionally been viewed as a safe obstetric procedure. A MEDLINE search (English language; 1975–

2009; search terms: *amniotic fluid embolism*, *anaphylactoid syndrome of pregnancy*, and *intrauterine pressure catheter*) revealed this to be the second case reported of anaphylactoid syndrome of pregnancy after intrauterine pressure catheter insertion.⁴

CASE

A 22-year-old gravida 2 para 0 at 41 weeks of gestation by last menstrual period and a 12-week ultrasonogram presented to labor and delivery with contractions every 4 minutes. She was dilated 3 cm, 90% effaced, and minus two station. The pregnancy had been complicated only by first-trimester bleeding. External fetal monitoring revealed a reactive fetal heart rate of 130 beats per minute (bpm), with moderate variability. No further cervical dilatation was noted 2 hours after admission, and oxytocin augmentation was initiated. Epidural anesthesia was placed, and spontaneous rupture of membranes occurred 4 hours after admission. Because no additional cervical change was noted after membrane rupture, an intrauterine pressure catheter was inserted to better assess contraction strength. The intrauterine pressure catheter was inserted during the latent phase of labor with an unengaged fetal head. The patient had a known fundal placenta, and the catheter was placed posteriorly without difficulty, with clear fluid return.

Immediately after intrauterine pressure catheter placement, the patient began coughing and complaining of shortness of breath, dizziness, and nausea. She was repositioned to her left side, where she continued to complain of difficulty breathing. The patient then began to vomit and experienced a tonic-clonic seizure, becoming unresponsive and demonstrating an agonal respiratory pattern postictally. The fetal heart rate dropped to a baseline of 80 bpm, and the patient went into cardiopulmonary arrest, with the cardiac monitor demonstrating pulseless electrical activity. A code blue was called at that time. Cardiopulmonary resuscitation (CPR) was initiated as per advanced cardiac life support guidelines. Three doses of epinephrine (1 mg/dose) and two doses of atropine (1 mg/dose) were administered. The attending obstetrician and anesthesiologist were present 12 minutes after cardiac arrest. The intubation was impeded by laryngeal edema but was ultimately accomplished approximately 16 minutes after the initiation of CPR. An emergency cesarean delivery was performed in the labor suite just subsequent to intubation. Cardiopulmonary resuscitation was discontinued when the cardiac rhythm returned to sinus tachycardia after delivery of the neonate. The neonate was immediately intubated, and CPR was performed by a neonatologist. Apgar scores were 1, 3, and 5 at 1, 5, and 10 minutes, respectively. Birth weight was 3.8 kg (8 pounds, 7 ounces). Initial cord pH was 7.17, with a base excess of –15.

The patient was taken to the operating room for completion of the surgery. Owing to the likely occurrence of disseminated intravascular coagulation (DIC), infusions of packed red blood cells, fresh frozen plasma, and platelets were begun

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immediately. The patient lost approximately 1,500 to 2,000 mL of blood intraoperatively and continued to ooze after uterine closure. She received one ampule of methergonovine 0.2 mg and seven ampules of carboprost tromethamine 250 micrograms, as well as a continuous infusion of oxytocin. Initial maternal arterial blood gas showed a pH of 7.06, P_{O_2} of 50, P_{CO_2} of 41, bicarbonate of 12, and base excess of -17. The DIC panel revealed a prothrombin time of 18.7 seconds, an international normalized ratio of 1.92, a partial thromboplastin time of 109 seconds, a D-dimer more than 17, and a fibrinogen of 46. The patient ultimately received 11 units of packed red blood cells, 3 units of platelets, and 4 units of fresh frozen plasma. Placental pathology revealed no trauma to the placenta or evidence of abruption but did show acute chorioamnionitis and funisitis.

Postoperatively, the patient was transferred to the intensive care unit, where she remained intubated and on the ventilator. An echocardiogram completed later that day showed mild impairment in left ventricular global systolic function, with an ejection fraction of 40%. A tracheostomy and percutaneous endoscopic gastrostomy tube were ultimately placed. Although her basic reflexes, including gag, pupillary, corneal, and respiratory, remained intact, she was otherwise unresponsive.

The patient was discharged to a long-term care facility 18 days postoperatively, with a tracheostomy and percutaneous endoscopic gastrostomy tube in place. Her mental status gradually improved, and while at the long-term care facility, she underwent physical and occupational rehabilitation. When the patient was seen 10 months after the event, she was experiencing short-term memory loss and upper extremity musculoskeletal contractures, but was otherwise neurologically intact. The infant was discharged from the neonatal intensive care unit at approximately 2 months of age, manifesting a seizure disorder and severe cerebral palsy. She experienced recurrent episodes of pneumonia after discharge and died at 10 months of age.

COMMENT

Intrauterine pressure catheter placement, a routine procedure in labor and delivery, can be associated with several adverse outcomes. These include placental abruption, uterine perforation, placental vessel perforation, cord entanglement, and endometritis. Extramembranous placement occurs 14–38% of the time, with adverse events occurring in 1 in 1,400 placements.⁵

Although intrauterine pressure catheters may be beneficial in providing more precise contraction monitoring, they have not been demonstrated to have a positive effect on maternal or neonatal outcomes.⁶

The pathologic examination of the placenta in this case revealed no trauma resulting from intrauterine pressure catheter placement or evidence of abruption. However, breaching the interface between amniotic fluid and maternal circulation leading to anaphylactoid syndrome of pregnancy may occur by two additional routes: disruption of the endocervical veins or uterine trauma. Anaphylactoid syndrome of pregnancy remains a clinical diagnosis in this patient because conclusive pathologic evidence was never sought. The presentation in the case, though, was indeed “textbook,” with acute onset of severe hypoxia, neurologic sequelae, and hemodynamic collapse with subsequent cardiopulmonary failure, followed by DIC.

This is the second documented case of anaphylactoid syndrome of pregnancy immediately after placement of an intrauterine pressure catheter⁴; however, it is unknown how many may have occurred and gone unreported. Although it has been speculated that there potentially could be an association between intrauterine pressure catheters and anaphylactoid syndrome of pregnancy, this case represents a probable direct causal link.

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