

Anesthetic management of lifesaving EXIT (Ex-utero intrapartum treatment) to open atrial septectomy

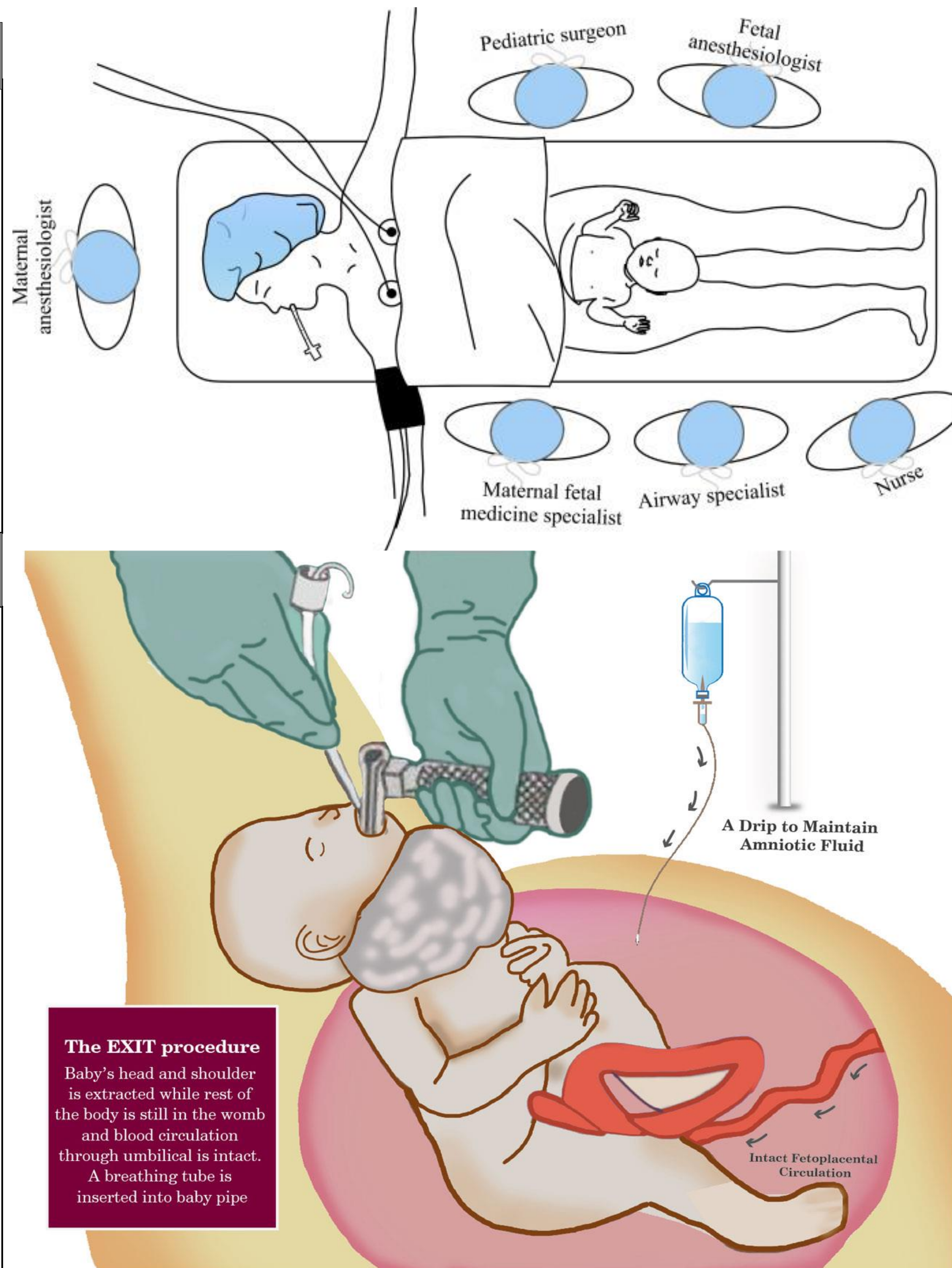
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BACKGROUND

The EXIT procedure has been utilized since 1989 to manage life-threatening fetal airway and cardiopulmonary anomalies. It involves partial delivery via cesarean section to allow for surgical correction of certain conditions while the baby is still attached to the placenta. Once the baby's condition has been stabilized, it is fully delivered, the umbilical cord is clamped, and the cesarean section is completed. The complex nature of the procedure requires unique anesthetic considerations and multidisciplinary coordination.

CASE PRESENTATION

A 35-year-old G2P1 underwent EXIT to open fetal atrial septectomy for hypoplastic left heart syndrome. A lumbar epidural, large-bore intravenous cannulas, and an arterial catheter were placed preoperatively. General anesthesia was induced and initially maintained with sevoflurane. Nitroglycerin was administered for additional uterine relaxation. Remifentanyl was started for maternal and fetal analgesia. The baby was partially delivered via cesarean section and the umbilical cord remained attached to the placenta. Warm crystalloid solution was instilled into the amniotic cavity. Intramuscular ketamine, fentanyl, and rocuronium were administered to the baby and the cardiothoracic surgery team performed median sternotomy, atrial septectomy, and central venous access. The baby was then intubated and fully delivered. Sevoflurane and nitroglycerin were discontinued, a propofol infusion was started, and uterotonics were administered. At the conclusion of the surgery, the patient was extubated. The epidural catheter was left in-situ for post operative analgesia.



DISCUSSION

Extensive multidisciplinary coordination took place preoperatively involving multiple anesthesia teams, cardiothoracic surgery, obstetrics, and nursing. Perioperative obstetric anesthetic considerations included achieving adequate uterine relaxation, maintaining uterine volume, preventing placental separation, preserving uteroplacental perfusion, optimizing placental gas exchange and preparing for significant postpartum hemorrhage. A combination of general and neuraxial anesthesia is typically performed to achieve these goals, although there have been recent case reports utilizing neuraxial anesthesia alone. Volatile anesthetic is initially used for uterine relaxation and then transitioned to TIVA to reduce postpartum hemorrhage. During the partial delivery, most of the baby's body remains within the amniotic cavity to maintain uterine volume and prevent significant temperature loss. Crystalloid solution is instilled into the amniotic cavity to reduce intraoperative fluid loss and the risk of premature placental separation. Pediatric anesthetic considerations include fetal monitoring and providing fetal amnesia, analgesia, and akinesia, as the fetus may feel pain as early as 12 weeks gestation.

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