Anesthetic Planning, Management and Challenges Involving Immediate Surgical Separation of Conjoined Twins after Cesarean Section

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Summary
The management of the emergency surgical separation of conjoined twins at delivery requires a multidisciplinary approach. We present the challenges of the anesthetic management for a set of thoraco-omphalopagus twins that required emergency surgical separation at birth.

This set of twins boys were diagnosed prenatally at the Center for Fetal Diagnosis and Treatment at the Children’s Hospital of Philadelphia. Fetal MRI and ultrasound showed a shared liver and pericardium. Twin A had a 4-chambered heart with no other anomalies. Twin B had massive cardiomegaly without outflow tracts from the heart – making him 100% dependent on Twin A for survival. He also had severe cerebroventriculomegaly, an absent corpus callosum and hypoplastic lungs. Twin B’s condition was incompatible with life.

Despite his heart providing all cardiac output for both twins, Twin A did not demonstrate in utero heart failure. Thus, the decision was made to not proceed with an EXIT-(ex utero intrapartum treatment) to-separation strategy. Instead, an emergency separation after C-section at 34-weeks gestation in attempt to save Twin A was planned.

A multidisciplinary meeting involving surgeons, anesthesiologists, obstetricians, neonatologists and the parents occurred prior to the procedure. Plans regarding the intubation of only Twin A and the potential challenges of the anesthetic management were discussed in detail.

Challenges to Anesthetic Management

Difficult Airway: The twins faced one another. Copious amounts of amniotic fluid were present and multiple attempts at laryngoscopy were made. Twin A developed bradycardia during laryngoscopy, which required two doses of IM atropine.

References:

Monitoring and Intravascular Access: Only Twin A was monitored during the case. Surgeons, neonatologists and anesthesiologists all aided in the successful placement of three PIVs. Umbilical artery line placement was unsuccessful. A radial artery cut-down line was done.

Cardiovascular instability: There was a risk of cardiac decompensation secondary to either exsanguination or heart failure of Twin A. In addition, changes to intrathoracic and intrabdominal pressures due to positioning and surgical manipulation causing cardiovascular compromise were possibilities.

Anesthetic Maintenance: Anesthesia was maintained with fentanyl throughout case. Prior to separation, medications were dosed using the twins’ combined estimated weight. 100% cross-circulation was assumed. After the twins’ shared vasculature and organs were separated, medications were dosed based on Twin A’s estimated weight.

Fluid and Transfusion Strategies: The massive transfusion protocol was activated and Factor 7 was available.

Discussion
The successful implementation and outcome of this case required careful multidisciplinary planning and coordination during all stages of management. In addition, the emergency separation of conjoined twins after birth presented several challenges to the team of pediatric anesthesiologists.