Serial Anesthetics for Imaging and Tissue Expansion in Preparation for Separation of Omphalo-Ischiopagus Tripus Conjoined Twins

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Introduction

Conjoined twins are rare, occurring in about 1:200,000 live births. Of these, the omphalo-ischiopagus tripus type is less common and associated with complicated anatomy. The embryologic defect involves either incomplete division of the embryonic disc or prenatal fusion of two originally separate monozygotic discs. These particular twins are attached at the mesentery, share a liver and certain GI and GU structures, and have a fused third lower extremity. Prior to separation, they must undergo a series of imaging studies and tissue expansion surgeries requiring general anesthesia. We report the anesthetic management of one set of conjoined twins undergoing multiple procedures prior to separation.

Case Report

The patients are two years old, 19.5 kg, omphalo-ischiopagus tripus conjoined twins. They were born via C-section at 32-weeks gestational age. Their medical history is notable for FTT with a notable size discrepancy requiring NG feeding and frequent urinary tract infections likely caused by contamination from the common cloaca-like anatomy. Our ethics committee was consulted and determined that separation was a reasonable option. The pre-separation procedures included CT and MRI imaging, diagnostic laparoscopy and cystoscopy, placement of tissue expanders and serial injections.

Some guiding principles were established. First, each twin would be treated according to her specific anatomy and physiology. Second, drug dosing was weight-based with an estimated 60%/40% split. Third, at least one anesthesiologist would be dedicated to each twin, with a supervising anesthesiologist in attendance.

Oral pre-medication of midazolam was given prior to all procedures. Standard inhalation induction was performed if no in situ IV access. For the CT/MRI studies, each twin was intubated and a ventilation technique was devised utilizing the adapter system from a double-lumen endotracheal tube to connect to a single MRI-safe ventilator for synchronized ventilation. For the first three tissue expansion procedures, mask airways and propofol infusions for maintenance were used. Due to increased difficulty with IV access, for subsequent injections we performed inhalational mask anaesthetics with intranasal desmedatominidine and fentanyl in order to preserve vessels. No anesthetic complications were noted during these procedures.

Discussion

Careful planning and coordination both within the anesthesia team and with the various surgical disciplines is essential to achieving safe and successful procedures. Each twin should be treated individually and have their own anesthetic team and plan. Notably, cardiovascular parameters differed greatly and required individually-tailored interventions. Positioning of the twins and two sets of surgical and anesthetic equipment is challenging and should be rehearsed.

References