Introduction

Congenital cardiac patients possess unique physiology and are not immune to comorbidities or perioperative events unrelated to their cardiac condition. This case report discusses a patient with double outlet right ventricle (DORV) and an unknown difficult airway who is suspected to have experienced opioid induced chest rigidity. Anesthetic management of DORV, chest rigidity from opioids, and the pediatric difficult airway algorithm will be reviewed.

Case

A 3 week old, 2kg baby with DORV presented for atrial septostomy. Preoperatively, the patient was on a prostaglandin infusion and tachypneic. Induction with fentanyl 10 µg was titrated over several minutes, after which BMV was impossible. Laryngoscopy provided a grade IV view and a second attempt resulted in no EtCO2 after ETT placement. Vital signs deteriorated and resuscitative efforts were initiated. A third intubation attempt provided radiographic confirmation of ETT placement, but no EtCO2. Resuscitative efforts continued until EtCO2 confirmation and vital signs stabilized. The septostomy was successful, the infant remained intubated and convalesced well in the NICU.

Discussion

DORV has an incidence of 0.9/1000 live births and occurs when both great arteries arise from the right ventricle with a VSD. Anesthetic management depends on coexisting pathology and its effect on the ratio of pulmonary to systemic blood flow. In non-restricted pulmonary flow, low Fio2 with avoidance of hyperventilation helps maintain systemic flow. In restricted pulmonary flow, supplemental oxygen may be used to ensure oxygen delivery to the body. Maintenance includes high-dose fentanyl of 50 to 100 µg/kg.

Chest wall rigidity is thought to be a rare complication of high-dose opioid administration. However, a study examining the incidence of chest-wall rigidity in infants found an occurrence of 9% after fentanyl administration. The dose ranged from 2.2 µg/kg to 6.5 µg/kg with administration over 2-3 minutes. Naloxone 20-40 µg/kg IV administration reversed the rigidity.

Pediatric airway management often is uneventful, however, difficult airways can have grave consequences if not managed properly. The algorithm for the unanticipated difficult pediatric airway has 3 key components, (1) oxygenation (2) tracheal intubation and (3) rescue.

Confounding factors, such as the prostaglandin infusion, congenital heart disease, and fentanyl administration, clouded this clinical picture and treatment options. Prostaglandin infusions can be associated with apnea. Naloxone treats opioid rigidity, but can result in a sympathetic surge that would interrupt the delicate balance of DORV physiology and without definitive evidence of rigid chest from fentanyl, paralytics would eliminate the wake up option and could lead to further complications.

REFERENCES