Anesthetic management of a newborn for Tracheo-esophageal fistula repair and anal atresia who also presents with Tetralogy of Fallot: a case report.
Jacqueline Tutiven, M.D. Assistant Professor of Clinical Anesthesiology, Pediatric Anesthesia
Michael Rossi, M.D. University of Miami Anesthesia resident CA-3
University of Miami Department of Anesthesiology, Pediatric Anesthesia

Introduction: A 2 day old, female infant, weighing 2.5 Kg, presented with type C tracheo-esophageal fistula, Tetrology of Fallot (TOF), right-sided aortic arch, imperforate anus, suprarenal insufficiency and ambiguous genitalia. She was scheduled for repair of TE fistula and colostomy.
Her right hand SpO2 was 85% (80 to 96%) spontaneously breathing room air and her vital signs were within normal range. The baby had a double lumen umbilical central venous line and a 24g IVcatheter in the left foot.

Intra-operative course: She was continued on an IV hydrocortisone infusion of .1mg/kg/hour throughout surgery. IV atropine 0.05mg was given prior to induction of anesthesia. The intubation was performed by direct laryngoscopy utilizing a miller 0 blade and an endotracheal tube 3.0 ID inserted on the 1st attempt.
The tube was purposefully placed in the right main bronchus and slowly pulled back until bilateral breath sounds were heard, confirming no sounds over the stomach. The tube was secured at 11cm to the upper alveolar ridge and the patient was placed on positive pressure ventilation with peak airway pressures, between 15 – 20 cmH20, rate 34 /minute, utilizing a Bain circuit. The infant was then positioned for left thoracotomy.
Maintenance of anesthesia consisted of halothane at 0.6% with a FiO2 of 0.4 in an air oxygen mixture. Neuromuscular blockade was achieved with rocuronium 2 mg; and fentanyl 4 micrograms. Intra-operative analgesia was provided with intermittent doses of morphine at 0.2mg at 1 and 2 hour intervals for a total amount of 0.7milligrams. During surgical manipulation of the left lung, the patient was ventilated by hand to maintain Sp02 above 90% and to decrease the changes in intrathoracic pressures. 2 boluses of albumin 5%, to a total of 50 ml to correct were required, in addition to fluid maintenance with lactated ringers and 5% glucose.
The neonate’s blood pressures were between 80 – 90 systolic and 50- 60 diastolic and the estimated CVP was 12cmH20 with the SpO2 fluctuating between the high 80’s and low 90’s. The total intraoperative time was 5 hours. Controlled ventilation was initiated following the repair and continued into the postoperative period. On day 2 the baby was extubated and made a satisfactory recovery.

Discussion: The primary hemodynamic considerations in infants with TOF are minimalizing changes in pulmonary and systemic vascular resistance. Furthermore it is also important to maintain adequate tissue oxygenation, and avoid increasing oxygen demands. Keeping the peak inspiratory pressure low and increasing the respiratory rate during the repair should improved preload and maintain oxygenation. Titration of morphine throughout the case gave us adequate analgesic coverage and avoidance of intense catecholamine release while providing appropriate vasodilatation. Thoracotomy and retraction of the left lung leads to hypoxia, hypercarbia and a rise in the PVR and worsens the shunting of deoxygenated blood to the systemic circulation. We avoided these changes by tailoring the patients’ metabolic requirements and providing an even distribution of ventilation to intravascular and circulatory support. The degree of pulmonary stenosis was offset by the PDA, which helped us maintain adequate pulmonary blood flow during the operation.

References:
1. Samuelson, P M.D.; Lell, W. M.D. Pediatric Cardiac Anesthesia, pp303-313
2. Greely WJ, Bushman GA, Davis DP, Reves JG. Anesthesiology 1986; 65:666-668