# Management of child with unilateral lung hypoplasia for ophthalmic surgery

Dear Editor,

We describe the anesthetic management of a child with unilateral lung hypoplasia and Tetralogy of Fallot (TOF). A 1-year 10-month-old male child was posted for congenital cataract surgery. The child was diagnosed as TOF with right lung hypoplasia at 8 months of age. The child had central cyanosis but active with no complaints of effort intolerance. He had history of cyanotic spells, delayed motor milestones, and weighed 8 kg. Auscultation of the chest revealed a pansystolic murmur and no air entry on the right side of the chest. He had a heart rate of 100 per minute and room air $SpO_2$ of 77%. The electrocardiogram and chest roentgenogram indicated dextrocardia [Figure 1]. Transthoracic echocardiography revealed TOF physiology (large subaortic ventricular septal defect, bidirectional shunt, and subpulmonic stenosis) with atrial septal defect and good biventricular function. A computed tomography (CT) angiogram of the aorta and pulmonary arteries confirmed dextroposition of the heart and abdominal situs solitus. The right lung was hypoplastic with the right main bronchus compressed between the right pulmonary artery and esophagus. The left lung was normal.

General anesthesia was induced with Fentanyl, ketamine, atracurium and maintained with air, oxygen and sevoflurane at 1 MAC (PC 14–16 cm $H_2O$) to maintain an EtCO2 of 30–35 mm Hg. The child had a heart rate of 82/min, BP 92/50 mm Hg, and maintained an SpO2 of 80% with FiO2 of 0.6–0.7. The eye was examined under anesthesia followed by lens aspiration and anterior vitrectomy in the right eye. Intra-operatively, the surgeon experienced increased intraocular pressure (IOP). It did not respond to supplementation of analgesia, NMB, and reduction in the MAC to 0.8. A bolus of propofol 10 mg was administered intravenously to reduce IOP. This resulted in transient hypotension and desaturation to 60% which responded to a fluid bolus of 50 ml. The procedure lasted 90 minutes and the postoperative period was uneventful.

The left eye was operated 10 days later. This time, the airway was secured with an Ambu LMA #1.5 after intravenous induction and NMB. Anesthesia was maintained with propofol infusion. The procedure and recovery were uneventful.

Unilateral pulmonary hypoplasia is often associated with cardiovascular and somatic malformations.[1] Boyden categorized pulmonary maldevelopment into agenesis,

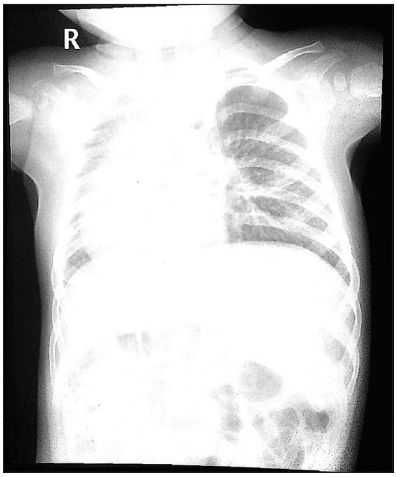


**Figure 1:** Skiagram of chest showing dextrocardia

aplasia, and hypoplasia.[2] Right lung agenesis has a worse prognosis due to less lung volume available in the left lung for compensatory hypertrophy.[1]

Careful examination of the CT, with digital reconstruction of tracheobronchial tree, helps identify any tracheal compression, stenosis, or pulmonary parenchymal abnormalities. This helps plan a safe anesthetic induction, ventilation, and airway management..[3] The anesthetic concerns also include maintenance of cardiovascular stability and avoiding rise in IOP and oculocardiac reflex.[4] The cardiac goals in TOF include keeping the systemic vascular resistance high, pulmonary vascular resistance low, avoiding dehydration, and maintaining cardiac output. The occurrence of hypercyanotic or tet spell intra-operatively may be treated with fluid bolus, morphine, soda bicarbonate, phenylephrine, ephedrine, or intravenous beta blocker.[5]

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## Conflicts of interest

There are no conflicts of interest.

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