

## CASE REPORT

## Anesthesia Management for Bronchogenic Cyst Surgery in a Toddler: A Delicate Balance of Care

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Bronchogenic cysts are congenital cystic malformations of the respiratory tract, originating from the foregut. They can manifest with a wide range of symptoms, from being discovered incidentally to causing life-threatening respiratory distress. We are describing perioperative anaesthesia management of a child posted for surgical resection of bronchogenic cyst.

A 2-year-old child presented with complaints of low-grade fever, cough, and breathing difficulties, particularly during crying. Upon examination, the child exhibited tachypnea, oxygen saturation levels between 88-92%, and reduced breath sounds on the right side of the chest. The child had experienced recurrent episodes of hospitalization due to cough and fever since the age of 2 months, which had been managed symptomatically. A chest X-ray revealed a homogenous opacity in the right upper lobe, prompting further investigation with a high-resolution CT scan of the thorax. The CT scan revealed a cystic lesion measuring 45x50x52 cm in the right superior

mediastinum, which abutted the trachea but did not cause luminal narrowing. (Fig. 1) A 2D echocardiography did not reveal any cardiac abnormalities. The child received intravenous antibiotics and supportive care before being scheduled for surgery.



Fig. 1: Radiological image of bronchogenic cyst.

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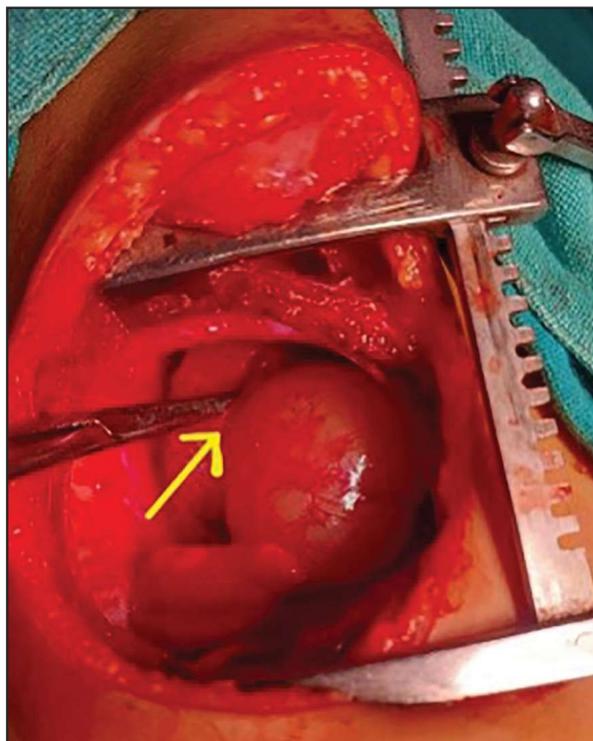


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After administering premedication with IV midazolam (0.05 mg/kg), IV glycopyrrolate (20 µg/kg), and IV ketamine (0.5 mg/kg), the child was taken to the operating room. Routine anesthesia monitors were applied, and after preoxygenation, anesthesia was induced with IV fentanyl (2 µg/kg) and IV propofol (2 mg/kg). Following confirmation of adequate ventilation, IV atracurium (0.5 mg/kg) was administered for neuromuscular blockade. The airway was secured using a 4.5 mm ID microcuff endotracheal tube. A left radial arterial line was placed with a 24G cannula to monitor blood pressure continuously. Anesthesia was maintained using a propofol infusion titrated to keep BIS value between 40-50, with intermittent boluses of fentanyl and atracurium. The child was ventilated in pressure-controlled ventilation mode, with inspiratory pressure adjusted to maintain a tidal volume of 5-6 ml/kg. Intravenous paracetamol (10 mg/kg) was administered 15 minutes before the conclusion of surgery. During the surgery, the child experienced two episodes of bradycardia during manipulation and dissection around the cyst, which were managed by temporarily halting the surgery and administering IV atropine. A complete excision was performed with primary closure of the defect and Valsalva manoeuvre was performed to see any leak. The perioperative course was uneventful. After completion of the surgery, erector spinae plane block was performed using 0.2% ropivacaine for postoperative pain management. The neuromuscular blockade was reversed with neostigmine (0.08 mg/kg) and glycopyrrolate (0.02 mg/kg). Once full neuromuscular recovery was achieved, the child was extubated and transferred to the PICU for further monitoring. The child was discharged after 5 days, having made a complete recovery.

The management of bronchogenic cyst excision requires comprehensive evaluation, preoperative assessment focusing on identifying compression symptoms, and discussions with the surgical team addressing the surgical approach and anesthesia planning, including the potential need for one-lung ventilation. Given the cyst's proximity to the entrance of the great vessels into the right atrium of the heart, the anticipation of hemodynamic fluctuations and potential hemorrhage underscores the importance of continuous beat-

to-beat arterial pressure monitoring. (fig. 2) Additionally, the proximity of the vagus nerve and the manipulation of nearby structures can lead to bradycardia, which can be effectively managed by temporarily pausing the surgery and administering antimuscarinic drugs. Postoperative pain management is crucial, and implementing multimodal analgesia, including ultrasound-guided chest wall blocks, plays a significant role in providing effective pain relief after a thoracotomy. Simultaneously, guided perioperative fluid therapy and prevention of hypothermia are vital aspects of care. Total intravenous anesthesia (TIVA) can be considered as an alternative to inhalational anesthesia for pediatric thoracic surgery. TIVA offers benefits such as better ventilation-perfusion matching and reduced chances of emergence delirium, making it a valuable option for this patient population. To conclude, managing pediatric bronchogenic cyst excision, careful preoperative assessment, collaboration with the surgical team, and vigilant monitoring for hemodynamic changes are critical.



**Fig. 2:** Intraoperative proximity of cyst with the great vessels entry into right atrium.

**Support:** none

**Conflicts of interest:** none

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