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Airway management of the neonate in respiratory distress can be exceedingly challenging. Anatomic variations of the airway can make establishing an airway even more difficult. We would like to present three patients who developed respiratory distress in the immediate post-natal period with anatomic airway abnormalities making tracheal intubation impossible.

Case 1

Our first patient was born at 35 weeks gestational age. Antenatal ultrasound revealed congenital anomalies including possible tracheo-esophageal fistula and Tetralogy of Fallot. After delivery, the patient developed respiratory distress, and oxygenation could only be maintained after intentional esophageal intubation. Direct Laryngoscopy and Bronchoscopy (DLB) revealed a tracheal blind pouch. A tracheostomy was attempted, but no trachea was present below the vocal cords. The decision was made to place the patient on VA ECMO. On day 2 of life, esophagoscopy revealed a common tracheal channel and branching bronchi off the anterior esophagus at a depth of 12cm from the gums. A large endotracheal tube was placed above the takeoff of the common channel and the patient was successfully ventilated after discontinuing ECMO until withdrawal of support on day 6 of life.

Case 2

Our second patient was born at 36 weeks gestational age via cesarean section and had been antenatally diagnosed with left sided congenital diaphragmatic hernia. Immediately after delivery, intubation was unsuccessful because of an inability to advance an endotracheal tube past the vocal cords. Flexible bronchoscopy revealed a tracheo-esophageal cleft. The patient was then transported to the operating room, and DLB revealed a complete tracheo-esophageal cleft. Each mainstem bronchus was seen leaving the common tracheo-esophageal channel, and distal to the bronchi, the esophagus was noted to continue posteriorly. At this point, each mainstem bronchus was selectively intubated fiberoptically with separate endotracheal tubes. Following confirmation of placement, each endotracheal tube was secured and ventilated independently, and the patient was transported to the intensive care unit.

Case 3

The final patient in our case series was born at 33 weeks gestational age. Prenatal ultrasounds were concerning for VACTERL and severe pulmonary hypoplasia. Intubation attempts after delivery were complicated by difficulty advancing the endotracheal tube further than 6cm. The patient was brought to the operating room, and DLB revealed a type D tracheoesophageal fistula, grade 3 subglottic stenosis, and an endotracheal tube positioned into the blind esophageal pouch. Emergent tracheostomy was performed while maintaining ventilation through the esophageal breathing tube. Open gastrostomy tube was then performed to vent air from the stomach.

Discussion

These cases demonstrate different techniques used to maintain oxygenation and ventilation in neonates with anatomic variations making tracheal intubation impossible. Esophageal ventilation in each case allowed for adequate oxygenation until definitive diagnosis and treatment plan could be established.

References

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