Emergent Airway Management in an Infant With Congenital Laryngeal Cyst Causing Airway Obstruction

Martina Downard M.D., Ivan Florentino-Pineda, M.D., M.B.A.
Anesthesiology and Perioperative Medicine, Medical College of Georgia, Augusta, Georgia

INTRODUCTION

Congenital Laryngeal Cysts (CLC) is a rare but often life-threatening condition that affects approximately one in 150,000 live births. Clinical presentation of CLC includes respiratory distress, stridor, feeding intolerance, and failure to thrive. If the cyst is large enough to cause complete obstruction of the airway, asphyxia may rapidly cause death if left untreated in a neonate. Therefore, CLC must be included in the differential in an infant or newborn with stridor and respiratory distress refractory to medical treatment. This case report describes an infant with a history of worsening stridor who was found to have a large cystic mass obstructing the airway.

CASE REPORT

A 5-week-old, 3.46 kg full term female infant, with a history of feeding intolerance and difficulty breathing at 9 days of life was admitted to the Pediatric Intensive Care Unit (PICU) secondary to an acute life-threatening event (ALTE) that involved stridor, increased work of breathing with feeds and episodes of apnea, with oxygen desaturation to the 60s for which oxygen therapy was initiated. Admission laboratory analyses including a full septic work-up were normal. As conventional treatment with humidified oxygen failed to improve her condition an ENT consultation was obtained. Flexible fiberoptic scope exam in the PICU revealed a large cystic mass obstructing the airway approximately 75% in an intermittent ball-valve fashion, and the decision was made to perform an emergent direct laryngoscopy for diagnosis and definitive treatment. On physical exam, the patient was tachypneic with inspiratory stridor, and sternal notch and intercostal retractions during inspiration.

CASE REPORT

Initial vital signs revealed a blood pressure of 97/64 mmHg, a respiratory rate of 55 breaths/min, a heart rate of 151 beats/min, and a SaO_2 of 90% while on 2 liters of oxygen by nasal cannula. The reminder of the cardiorespiratory examination was unremarkable. In the operating room, monitors were attached and anesthesia was induced with 2-6% sevoflurane in oxygen by mask. Induction of anesthesia was characterized by persistent desaturation moderate difficulty during mask ventilation. After a 24G intravenous catheter was placed, 2 µg/kg of fentanyl and 0.1 mg/kg of vecuronium were administered, and the patient was intubated with a 3.0 uncuffed ETT without difficulty, carefully maneuvering around the cystic mass. Adequate ventilation with good breath sounds bilaterally was noted. Further examination of the cyst was performed using a Parson 0 degree telescope, which defined the cyst as a laryngeal saccular cyst originating from the left anterior ventricle and protruding into the supraglottic area. Microlaryngeal scissors were used to pierce the cyst, draining thick white mucoid fluid. The entire cyst was excised using microlaryngeal scissors and forceps. The glottic structures appeared normal with no other lesions noted. The patient was transferred to the PICU for further care. Approximately 72 hours after the cyst was excised, she was extubated to room air and did not develop any difficulty breathing post-extubation. A repeat fiberoptic exam at one-and-a-half week follow-up showed a widely patent glottis with no signs of airway obstruction.

DISCUSSION

Although rare, CLC can cause sudden airway obstruction and should be considered in the differential diagnosis in newborns with worsening respiratory distress and stridor. Our patient displayed all the symptoms frequently associated with a laryngeal cyst, including worsening stridor, poor feeding, apnea and failure to thrive. Initial work-up should include lateral cervical and chest radiographs and laryngoscopy. If the origin of the cyst is still uncertain, CT or MRI scan are useful. Other laryngeal anomalies that could resemble the presentation of CLC in the newborn period include: Cystic hygroma, hamartoma, dermoid cyst, lymphangioma, thyroglossal duct cyst, thyroid remnant cyst, cervical meningocele, anterior encephalocele, congenital ranula and intraoral duplication cysts. CLC are classified based on their site of origin into thyroid cartilage (1%), ductal (75%) and saccular (24%) types. Saccular cysts is an embryological malformation in the laryngeal appendage resulting in cystic distention of the saccule while ductal cysts result from obstruction of the submucosal gland collecting ducts to cause mucous retention. Surgical management of laryngeal cysts includes aspiration, marsupialization and complete resection of the cyst. Pediatric anesthesiologists should be aware of laryngeal cysts since early emergent surgical intervention will require the expertise of rapid yet methodical management of these critical airways to achieve the best clinical outcome.

References
1. DeSanto LW, et al., Laryngoscope 1970
2. Lee WS, et al., International J Pediatric Otorhinolaryngology 2000