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Case Report

Critical airway management and weaning in neonate with large vallecula cyst: Anesthetist perspective

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ABSTRACT

Congenital laryngeal cyst is identified as a rare cause of stridor in infants. A small cyst remains asymptomatic, whereas large cyst can block laryngeal inlet and can lead to airway obstruction. In pediatric population, it is very important to make prompt diagnosis and immediate intervention to avoid respiratory distress that leads to infant morbidity and mortality. In this case report, from an anesthetic standpoint, we report a 30-day-old infant with a saccular vallecular cyst who presents with anticipated challenges with airway management and ventilator weaning. Furthermore, we would want to draw attention to the procedures that will be useful in determining when a newborn is ready to be weaned and when they can safely be removed from artificial breathing.

1. Introduction

Laryngeal cyst is identified as very rare cause of neonatal respiratory obstruction. The incidence is approximately to be 1.8 in 1 lakh newborns.[1] Minimally invasive surgery such as Marsupialization will be the primary treatment of choice for excision of laryngeal cyst in the children to avoid difficult weaning and need of prolonged mechanical ventilation.[2,3]

2. Case Report

A 15 day old girl child was referred to otorhinology team for stridor by neonate care provider in our hospital. Due to severe maternal eclampsia, mother underwent a lower segment cesarean surgery at 38 weeks gestation and baby was delivered uneventful, weighed 2.4 kg at birth. The child was fed by orogastric tube from day 1 of life. Her Apgar score was 6 out of 10 atnoted. Sepsis screening w, Empirical antimicrobials was started.

C reactive protein showed rising trends. Physical examination showed noisy breathing associated with minimal substernal and subcostal recession on inspection. She also had features of dysmorphic facial asymmetry, microcephaly, flat nasal bridge. Multiple trials of extubation were attempted but failed, so child remained intubated for 15 days. The baby underwent direct laryngoscopy examination under general anesthesia, which revealed subglottic stenosis with synchronous saccular vallecular cyst as shown (Figure 1). The decision for marsupialization of cyst was proposed (Figure 2). In order to prevent airway-related issues such as blood aspiration, ventilation leaks, hypoxia and improper gas exchange, the airway was prioritized in this case. Auscultation was used to confirm breath sounds using an uncuffed, size 4 endotracheal tube that was positioned at lip level 10 cm away and kept sealed.

Marsupialization of the cyst was done with micro laryngeal instruments.[2] Haemostasis was achieved with the application of topical adrenaline and diathermy. Post-operative analgesia was given by systemic analgesics. Pre-operative period was uneventful and the child was shifted

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to Paediatric intensive care unit for mechanical ventilation. Post-operative day (POD 1), The child was extubated and weaned with NIV bipap with no respiratory adverse events. POD2, attempted for weaning with nasal cannula 4 litres of oxygen, however child did not tolerate showed signs of respiratory distress.[3,4] Repeated flexible laryngoscopy later showed a normal larynx with no remnant of the cyst. Child was doing fine and was discharged home. On follow up after one month through phone, no events of respiratory distress was complained by parents and also child tolerate breast feeding.

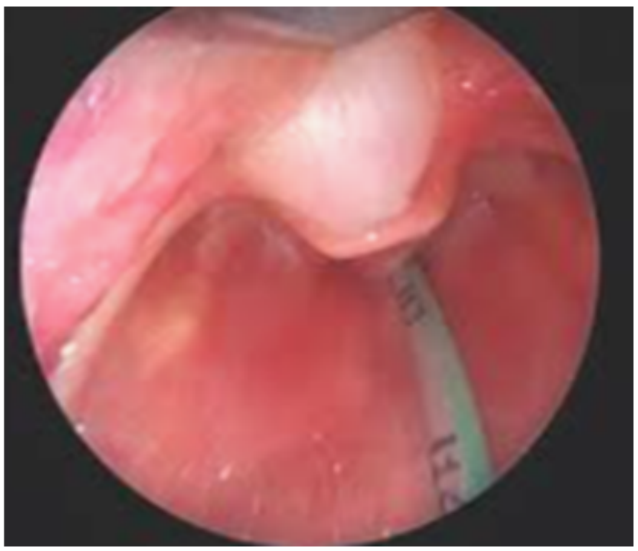

Figure 1: Saccular vallecular cyst

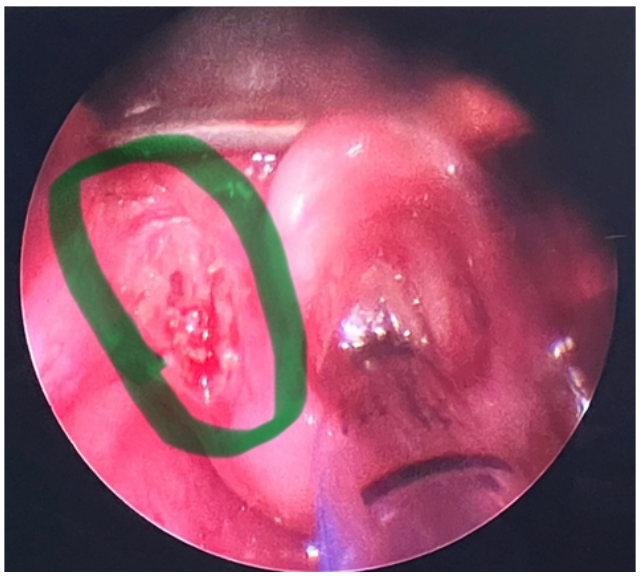

Figure 2: Excision of cyst

3. Discussion

3.1. Embryology

Larynx develops from endodermal lining and adjacent mesenchyme of foregut between 4^{th} and 6^{th} branchial arches. By end of 8 weeks larynx is clearly identifiable, epithelial lamina dissolves, resulting in patent opening into trachea.[1] Congenital anomalies occurs due to disturbance in embryogenesis as a result of intrauterine events that affects embryogenic and fetal growth.

3.2. Clinical features

Clinically manifests as Respiratory obstruction, stridor, weak cry, dyspnea, tachypnea, aspiration, cyanosis and sudden death.

Laryngeal or saccular cyst appears as small out pouching lateral ventricle and saccule shaped. No communication with airway directly, so remains only mucous. Smaller cyst are asymptomatic but when it enlarges, cyst is vulnerable for infection causing hoarse stridor and rapidly increasing airway obstruction.

3.3. Airway management

Paediatric airway anatomically differs from adolescent. Epiglottis lies at antero-posterior plane, so techniques used routinely to elevate them during laryngoscopy will be ineffective. Therefore, anaesthesiologist prefer to use of straight or semi curved blade designed to directly elevate epiglottis in children under age group of 4 to 5 years.[2,3]There are many available tools to facilitate tracheal intubation However, direct laryngoscopy remains the gold standard. And also, safe precautions primitive importance given to minimise pressure trauma to delicate paediatric airway.

The elliptical shape of the cricoid leads to possibility that an uncuffed tube with an acceptable leak pressure may still be causing pressure trauma to subglottic mucosa.[3]

3.4. Weaning and extubation

Different modalities are available to assess readiness for weaning and extubation in pediatric age group. It is important to know the difference in the terminologies like weaning failure and extubation failure for taking prompt decision. Extubation failure is defined as reintubation within 48 hours of extubation.[5] In children, presently there are only limited clinical works available regarding weaning and extubation. Due to least available data till now, low extubation failure rate that have been reported.[6,7]

Readiness of extubation in neonate can be assessed by conducting checklist in the past 24 hours. This includes implementation of trials on CPAP, stopping feeding, Spontaneous breathing trials (optional) and changing to pressure support two hours before extubation plan. These

protocols will help to reduce the stressful experience of extubation and re intubation, however there are no generally accepted guidelines for these checklist. [8]

4. Conclusions

An essential competency for an anesthesiologist is airway management. Handling the pediatric airway safely and effectively requires knowledge of the available techniques and instruments, due to anatomical and physiological variances and critical clinical disorders affecting children.

5. Source of Funding

None.

6. Conflicts of Interest

None.

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