Open Cardiac Surgery in a 7 Month Old with Severe Glottic Stenosis

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Introduction

Tracheostomy patients presenting for open cardiac surgery are challenging. Due to the serious risks of mediastinitis and sternal wound infection, tracheostomies are preferentially removed, oral intubation is performed, and surgical alternatives to full median sternotomy are explored. An infant with tracheostomy presented for urgent open ventriculoseptal defect (VSD) repair, pulmonary artery band removal and was found to have an undiagnosed stage IV glottic stenosis precluding oral intubation.

Our case is the first case we could find in the pediatric literature of a patient with a tracheostomy site used for open cardiac surgery. We found two other case reports of adult patients with tracheostoma for cardiac surgery. We present our case management which included intraoperative consults and finding of stage IV glottic stenosis.

Case Description

PMH: 7 month old former 26 week twin with Down syndrome, tracheostomy and h/o grade 2 subglottic stenosis


Induction: Ketamine, and vecuronium.

Intubation sequence: Grade 1 view, nasal ett advanced to the glottis with maccall forceps, glottis was closed

Multidisciplinary Collaboration: Ear nose throat (ENT) consult was called to the OR

Anesthesia team requested 2.7mm HD fiberoptic bronchoscope

Airway Findings: ENT and anesthesiology teams were not able to pass the fiberoptic through the vocal cords

Rigid bronchoscope did pass the vocal cords.

Thick >1cm grade 3 subglottic stenosis was present extending from the vocal cord to the stoma

Glottis was not dilatable because of the thickness and diameter of the stenosis

2.0 ett could possibly be inserted per ENT

Decision-making: 2.0 Ett is difficult to ventilate with for cardiac surgery

Ett inserted through the tracheostomy site was considered an infectious and mediastinitis risk

Oral or nasal intubation would have been ideal, but a complete laryngotracheal reconstruction would have been required followed by several months of recovery time.

Reinforced ett inserted into the tracheostomy site sutured away from the surgical site. The risk of delaying the surgery several months, was weighed against the risk of infection, and mediastinitis.

Procedure: Sternotomy with cardiopulmonary bypass. VSD repair, and PA band removal

Images

Discussion

Glottic stenosis: rare condition that may be congenital or acquired

May accompany subglottic stenosis, and be in a posterior or anterior location. Complete fusion of the vocal cords is extremely rare

Anterior glottic stenosis is the most common form, usually due to prolonged endotracheal intubation.

Risk Factors: Trauma, duration of intubation, oversized etts, and gastroesophageal reflux disease

Symptoms: range from a weak cry, hoarseness to respiratory distress, and aphonia

Diagnostic studies: labs, imaging, and procedures. Labs are usually performed if there is suspicion for a granulomatous disease. Cat scan imaging can assist tremendously in evaluating the length and thickness of the glottic stenotic segment. Direct and fiberoptic laryngoscopy are also essential procedures to evaluate the stenosis.

Our Case: Intraoperative fiberoptic laryngoscopy revealed severe glottic stenosis. Given the urgency to repair the patients cardiac condition, waiting several months was undesirable, and the risk of infection and mediastinitis with an ett placed through the tracheostomy site became the team’s choice.

Post-operatively: patient’s course was indeed complicated by mediastinitis, sternal wound infection, and MRSA bacteremia.

The patient’s infection was treated and he is currently in stable condition 2 months post-op.

Conclusion

This case illustrates the unusual presentation of a severe glottic stenosis for pediatric cardiac surgery. We reviewed the elements of glottic stenosis and the integration of the ENT, cardiac surgery, and anesthesia teams. Should similar findings of glottic stenosis in patients presenting for pediatric cardiac surgery occur in the future, we plan to use similar steps, diagnostic procedures, and consults.

References


