Anesthetic management for aortopexy in an infant with tracheomalacia

Dear Editor,

Primary tracheomalacia is a congenital disorder that causes weakening of tracheobronchial cartilaginous bridges. This leads to severe narrowing of tracheal lumen during inspiration. It is often associated with esophageal atresia, tracheoesophageal fistula, and gastroesophageal reflux.[1] Aortopexy helps in the surgical correction of severe tracheomalacia, where the aortic arch is fixated to the sternum, which pulls the pretracheal fascia, thereby opening the tracheal lumen.[2,3]

We report a case of a 3-month-old male child who had history of recurrent cyanosis while crying. He had been operated for esophageal atresia and tracheoesophageal fistula at day 1 of life, following which he was on mechanical ventilation for 10 days. Preoperative bronchoscopic examination revealed severe tracheomalacia just above the carina [Figure 1a and b]. Computed tomography (CT) scan was done to rule out any vascular compression. The child was posted for aortopexy after midline sternotomy.

An intravenous line was secured in the ward, and premedication was avoided. After taking an informed consent, the child was taken to the operating room and ASA standard monitors were attached. Difficult airway cart with rigid bronchoscope and cardiopulmonary bypass

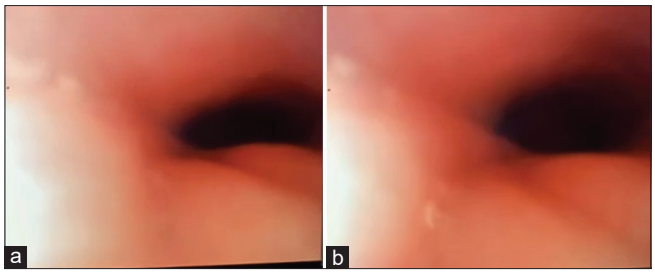

Figure 1: (a and b) Preoperative fiberoptic bronchoscopic images of trachea showing narrowing of tracheal lumen during inspiration and normal lumen during expiration, respectively

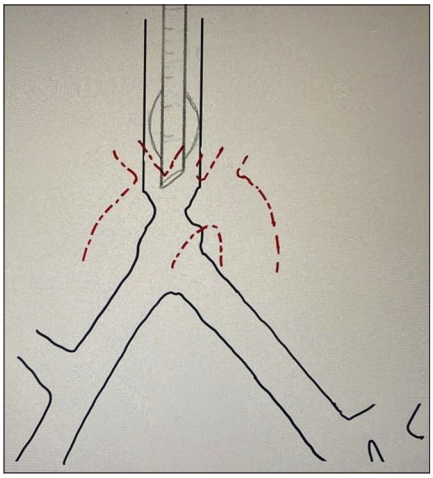

Figure 2: Line diagram showing positioning of endotracheal tube just proximal to the tracheomalacia

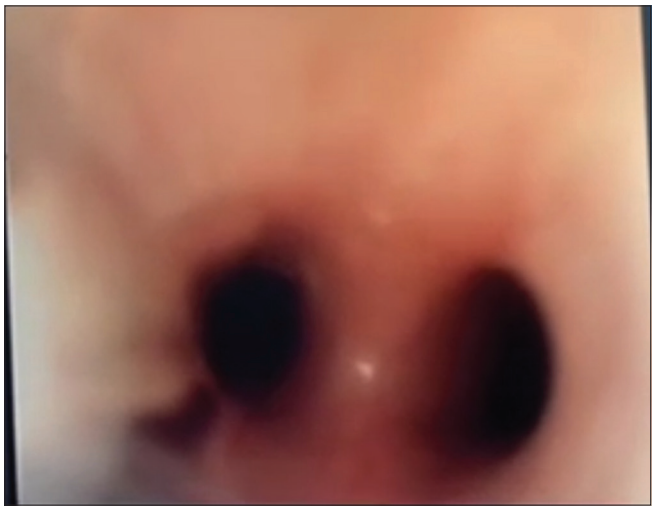

Figure 3: Fiberoptic bronchoscopic image showing tracheal lumen after corrective surgery

machine were kept on standby. The child was induced with sevoflurane and intubated using C-MAC videolaryngoscope with 3.5-mm cuffed endotracheal tube. After confirming bilateral air entry, tube was fixed and neonatal fiberoptic bronchoscope was introduced through the endotracheal tube to assess dynamic airway collapse during spontaneous respiration.[4] The fiberoptic bronchoscope was designed by Olympus. It measured 2.2 mm in outer diameter and 1.8 mm in diameter at the distal tip. It allowed rotatory and angulation movements. The tube was positioned just proximal to the site of constriction and fixed [Figure 2]. Anesthesia was maintained with oxygen: air, sevoflurane, and atracurium. Invasive lines including right internal jugular vein and right radial arterial line were secured in view of anticipated hemodynamic perturbations associated with surgery involving major vessels. The surgery was uneventful. At the end of the procedure, adequate tracheal decompression was confirmed with fiberoptic bronchoscope [Figure 3] and the patient was shifted to pediatric intensive care unit intubated.

Besides pediatric anesthetic concerns, it required careful securing of airway under inhalational anesthesia while maintaining spontaneous respiration, as neuromuscular blockade could lead to airway collapse due to loss of muscle tone. Maintaining adequate anesthesia depth is a challenge, as inadequate depth could precipitate spasm and excessive depth could lead to loss of muscle tone and airway collapse. Neonatal fiberoptic bronchoscope was used to assess dynamic airway collapse and to guide the degree and position of aortopexy.[5] Manipulation of aorta could lead to hypotension and bradycardia or catastrophic bleeding, necessitating emergent cardiopulmonary bypass. Patient should be adequately preloaded. Good anesthesia depth and atropine can prevent majority of vagal stimulations. In case of severe hypotension, relieving compression on the vascular structures can prevent such episodes.

Conclusion

Anticipated difficult airway requires careful planning and due preparation for any catastrophic possibilities, which becomes even more challenging for the anesthetist when it involves a pediatric case.

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Conflicts of interest
There are no conflicts of interest.

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