Complicated airway management in a neonate of congenital trachea-oesophageal fistula with subglottic stenosis

Sir,

Tracheo-oesophageal fistula and oesophageal atresia (TOF/OA) in neonates are known to coexist with other congenital anomalies in almost 50% of cases.[1] The congenital subglottic stenosis (SGS) rarely has been reported to occur with TOF/OA. We describe the management of a 31 weeks preterm male neonate weighing 1.1 kg who presented for surgical repair of TOF/OA (Gross C/Vogt III b type) on day 2 of life. He had respiratory distress soon after birth for which intubation was attempted; failing of which nasal continuous positive pressure (CPAP) was provided in Intensive Care Unit (ICU). On further evaluation, the baby was found to have tiny patent ductus arteriosus with ventricular septal defect, bilateral renal agenesis and vertebral defects. On arrival in operation theatre (OT), the vitals were heart rate 135/min, blood pressure 74/40 mm Hg and oxygen saturation of 96% on nasal CPAP. Anticipating difficult airway in view of previous failed attempts at intubation, difficult airway cart with available resources were prepared and availability of ENT surgeons in OT was ensured. Anaesthesia was induced with 3–4% sevoflurane with oxygen and fentanyl 2 μg intravenous (IV) was administered. After adequate depth of anaesthesia, intubation with 2.5 mm endotracheal tube (ETT) using 00 Miller blade laryngoscope was attempted but tube could not be negotiated below vocal cords. We then decided to try intubation with 2.0 mm ETT after giving injection atracurium 0.5 mg and gentle positive pressure ventilation. The intubation attempt again failed. An indigenous ETT made from 6 Fr feeding tube having an internal diameter <2 mm (cut short to match the length of 2.0 mm ETT) was then tried to pass below vocal cords. This tube was very pliable, and we could pass only tip below the vocal cords. We could not use ETT stylet to aid in intubation as the smallest available tube stylet in our OT was not able to pass through the indigenous ETT. The positive pressure ventilation through this ETT (attached to the connector of 2 mm ETT using Jackson Rees breathing circuit) was started but it soon got dislodged. The child was continued on gentle positive pressure ventilation through a face mask. As we were not able to pass even a tube of internal diameter (ID) <2 mm to the trachea, ENT surgeons performed rigid endoscopy under anaesthesia and confirmed grade 3 SGS. The surgical tracheostomy was planned after discussion with surgeons and family members of the child. The tracheostomy was performed and a tracheostomy tube of ID 3.0 mm was inserted. In view of multiple intubation attempts, it was decided to perform gastrostomy under anaesthesia and TOF/OA correction was planned for a later stage. The child was provided adequate anti-inflammatory cover and shifted to ICU postoperatively.

There are few case report of SGS associated with TOF/OA. The airway management of such patients is extremely challenging for anaesthesiologist as

the nature of surgery demands lateral positioning of patient and ETT is the only safe option of maintain the airway. The tracheal intubation may be successful in grade 1 and 2 SGS; however, in grade 3 and 4, it can be difficult even with smallest available ETT as in our case. The neonatal fibreoptic bronchoscope was not available in our hospital; it can be useful in such cases as apart from airway management, it aids in confirmation of diagnosis. Successful intubation with ETT made from feeding tube of 6 Fr size has been reported for a TOF repair.[2] However, we find the material of feeding tube to be soft and pliable compared to standard ETT and has a risk of dislodgement and occlusion of the lumen of the tube during surgery. Another proposed option for airway management in SGS is to dilate the stenotic segment with Fogarty catheter and then pass ETT. The feasibility of this intervention in emergency cases is doubtful as SGS otherwise requires multiple sessions of dilatation for success. Keeping the tip of ETT above the stenosis in a neonate of SGS, presenting for an abdominal surgery has been reported.[3] However, intra-operatively, the tube was dislodged, re-intubation attempts were unsuccessful and patient developed cardiac arrest. Laryngeal mask airway may not be feasible for major abdominal or thoracic surgeries as in our case.

Tracheostomy performed after failure of intubation is reported during TOF/OA with SGS management.[4,5] Postoperatively, the babies responded well to dilatation of stenosis at 15 months of age. Although tracheostomy in neonates is not desirable, it is the only safe option available for SGS after failure to pass smallest ETT to trachea. Other adventurous plans of keeping tube above stenosis or using sheath of IV cannula or feeding tube has a risk of dislodgement with disastrous consequences and should be used only if an emergency condition arises.

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