

Anaesthetic considerations for slide tracheoplasty for the management of recurrent tracheo-oesophageal fistula

Sir,

Recurrent tracheo-oesophageal fistula (rec-TEF) occurs in 5 – 10% of cases after the repair of congenital tracheo-oesophageal fistula (TEF) and oesophageal atresia.^[1] Slide tracheoplasty is a corrective surgery for the rec-TEF. Here, we present anaesthetic management of a 13-year-old male patient diagnosed with rec-TEF, who had presented with recurrent respiratory tract infection, occasional cough aggravated by supine position, and by ingestion of both liquids and solids. A TEF repair for a type C TEF was performed on day 3 of life followed by an uneventful post-operative period. At 4 years of age, he was hospitalised for recurrent lower respiratory tract infection and pneumonia. Recurrence of TEF was evident on a computed tomography (CT) scan of the chest, which was not amenable to repair by electrocauterisation and fibrin glue treatment. After the next few days, he underwent endoscopic tracheobronchial Y-stent insertion.

At present, bronchoscopy had revealed oval-shaped TEF 1 cm above carina and gastro-duodenoscopy had confirmed the same in the corresponding site in oesophagus. This patient had CT scan findings suggestive of pneumonia [Figure 1]. Based on the clinical assessment and CT scan report, the patient was considered a suspected case of coronavirus disease (COVID)-19.

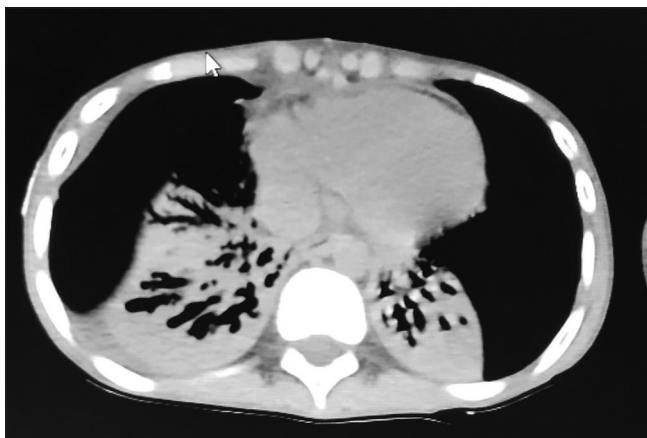


Figure 1: Preoperative chest CT scan

Open surgery was necessary for this patient to ensure complete repair as the patient had undergone multiple unsuccessful interventions previously (TEF repair, fibrin glue injection and electrocauterisation). Tracheo-bronchial Y-stent removal and rec-TEF repair with slide tracheoplasty under general anaesthesia with cardio-pulmonary bypass (CPB) were planned. Institutional protocols for COVID-19 prevention were followed. Personal protective equipment kits were used by the peri-operative team. Preoxygenation was done for 5 minutes and was supplemented with oxygen by nasal prongs to prevent desaturation during the apnoea period of intubation. Anaesthesia was induced with intravenous fentanyl 4 µg/kg, intravenous propofol 1.5 mg/kg and intravenous pancuronium 0.1 mg/kg; and maintained with sevoflurane and oxygen. To prevent aerosolisation, it was decided to avoid bag ventilation unless oxygen saturation lowered to 90%. Under direct laryngoscopy, endotracheal intubation with a 5-mm internal diameter (ID) cuffed endotracheal tube (ETT) was done and ETT position was confirmed with capnography. The position of ETT below the TEF and above the carina was not necessary due to the presence of a stent blocking the TEF.

The ventilator detected a leak due to TEF of around 40%. The peak inspiratory pressure on the pressure control ventilation mode of the anaesthesia machine was adjusted to achieve the desired tidal volume. A midline sternotomy and initiation of CPB were done. After the initiation of full CPB, the ETT was withdrawn and bronchoscopy was performed with a flexible 3.5-mm bronchoscope to remove the tracheobronchial Y-stent [Figure 2]. Slide tracheoplasty was performed, the oesophageal rent was closed and reinforced with



Figure 2: Tracheo-bronchial Y-stent

a pericardial patch. Flexible bronchoscopy visualised the anastomotic site and ruled out any obstruction due to blood clots. Under direct laryngoscopic vision, the patient was re-intubated with 6 mm ID cuffed armoured ETT. The Valsalva test did not demonstrate any air leak. The mean bypass time was 227 minutes, which included evaluation under bronchoscopy, Y-stent removal and slide tracheoplasty. Weaning from CPB was uneventful with the infusion of dobutamine 5 µg/kg/min. The patient was shifted to intensive care unit and nursed in a neck flexed position till extubation, which was planned after 48 hours of surgery. A postoperative CT scan was done after 8 days to rule out any deformity.

A negative recombinant polymerase chain reaction result does not exclude COVID-19 infection and chances of false-negative results exist.^[2] Maintaining uninterrupted ventilation and oxygenation is a challenging task for airway surgeries.^[3] High-frequency jet ventilation was not feasible because there was a risk of rapid aerosolisation of severe acute respiratory syndrome coronavirus-2 during manipulation of the airway. CPB is a lifesaving modality of oxygenation.^[4] CPB prevents repeated airway manipulations, aerosolisation and interference by ETT or tracheostomy tube in the surgical field. Although inflammatory response and coagulopathy are complications of CPB, it is useful in cases of involvement of the distal third of the trachea due to the need for retraction of the innominate artery during slide tracheoplasty.^[5] CPB is useful as slide tracheoplasty is done in proximity to ascending aorta and superior vena cava. 'Prevention is better than cure', an age-old teaching, needs to be followed in this pandemic by all healthcare workers for managing all patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Submitted: 10-Mar-2021

Revised: 21-Apr-2021

Accepted: 24-Aug-2021

Published: 29-Oct-2021

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Access this article online	
Quick response code	Website: www.ijaweb.org
	DOI: 10.4103/ija.IJA_163_21

How to cite this article: Bangal K, Senniappan K, Joshi SS, Murthy K. Anaesthetic considerations for slide tracheoplasty for the management of recurrent tracheo-oesophageal fistula. *Indian J Anaesth* 2021;65:763-4.

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