

Acquired tracheoesophageal fistula with undiagnosed tracheal stenosis: A simple innovation to avoid tracheostomy!

Sir,

Acquired tracheoesophageal fistula (TOF) is a rare but serious complication of malignancy and trauma. Endotracheal (ET) cuff-related trauma in patients subjected to prolonged mechanical ventilation constitutes more than 75% of the non-malignant cases of acquired TOF.^[1]

We report a case of acquired TOF in a 24-year-old male of average built with adequate nutritional status, listed for repair through cervical incision. The patient had a history of prolonged mechanical ventilation in the past. Barium swallow, fibre-optic bronchoscopy and upper gastrointestinal endoscopy showed one 8–10 mm sized fistula at 9 o'clock position, approximately 4.0 cm below the vocal cords [Figure 1a and b].

Since the fistula was located in the upper trachea, we planned for a fibre-optic-guided distal to fistula (DTF) intubation and ensuring, at the same time, a safe distance between tip of ET tube and carina. Routine general anaesthesia with preservation of spontaneous respiration was performed. Fibre-optic bronchoscopy (FOB)-guided oral intubation using a no. 8 armoured ET tube was attempted. Marked difficulty was observed in negotiating the tube DTF on two attempts. The ET tube cuff could be placed

only marginally DTF. Suspecting stenosis DTF and to prevent any damage to ET cuff during repair and a potential tracheostomy, we resorted to a simple method. The cuff length of ET tube was approximately halved by winding sterilized surgical suture (braided silk black) around it and securing it to proximal end of the tube using a sterile tape.

After successfully placing the tube DTF, anaesthesia was maintained with oxygen, air and desflurane with intermittent boluses of rocuronium and fentanyl. After intubation and thereafter, cuff pressure was monitored at regular intervals using aneroid manometer. Intracuff pressure <30 mm of Hg was observed on all occasions. Apart from objective assessment of cuff pressure, we employed the principle of minimal occlusion volume, wherein cuff was inflated with a volume only slightly greater than what is required to achieve a seal with no evident leak at peak inspiratory pressure. Rest

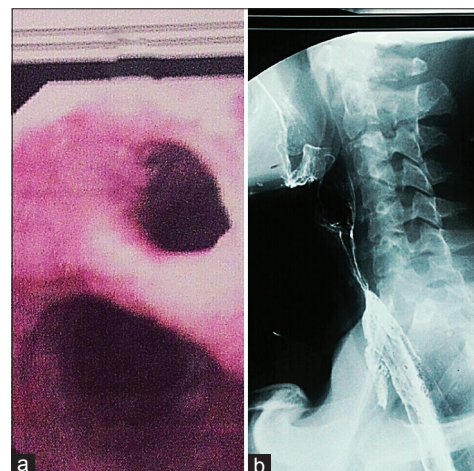


Figure 1: (a) Upper gastrointestinal endoscopy showing tracheoesophageal fistula. (b) Barium swallow study

of the course was uneventful. On completion of the procedure, the patient was reversed and trachea extubated. An expert opinion of interventional pulmonologist was sought for further management of tracheal stenosis.

Acquired TOF and tracheal stenosis share a similar risk factor profile, which includes a history of prolonged intubation (>24 h), history of traumatic intubation, unrecognized cases of malignancy, infections, inflammation or collagen vascular diseases. History of prolonged intubation is the most common cause of tracheal stenosis.^[2] The usual site of TOF and tracheal stenosis secondary to prolonged intubation is the site of cuff inflation^[3]. However, in our case, tracheal stenosis was encountered approximately 1–2 cm DTF.

Anaesthetic management of cases involving TOF repair always poses a challenge to anaesthesiologist with considerations such as sharing the airway, prevention of pulmonary soiling and intubation into fistula. Such an airway challenge can be further compounded by undiagnosed and asymptomatic tracheal stenosis, thereby making a detailed preoperative evaluation, including FOB essential to successful management of TOF.

A carinal or bronchial TOF usually requires one-lung ventilation for isolating and repairing TOF. However, proximal TOF requires DTF intubation for isolating fistula and preventing gastric insufflation.

We reduced cuff length using a suture [Figure 2a] and secured it to the proximal end of the ET tube using a sterile tape, thereby converting a high-volume low-pressure cuff to a low-volume high-pressure cuff [Figure 2b].

Reduction of cuff length ensured adequate ventilation and helped in preventing any damage to the cuff during repair. Post-cuff length reduction of an armoured ET tube is ruled out as this part carries inflation lumen. Using braided silk black suture to reduce cuff length is a safe and effective method and can prove to be a useful innovation in scenarios like this to avoid a potential tracheostomy. However, converting a high-volume low-pressure cuff to high-pressure low-volume cuff may further compromise vascularity of already stenosed and fibrotic trachea making cuff pressure monitoring a must with this innovation.

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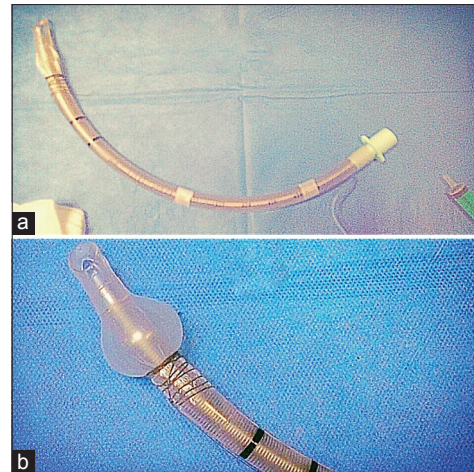


Figure 2: (a) Suture to reduce cuff length. (b) Inflated reduced cuff length

Conflicts of interest

There are no conflicts of interest.

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