Solving extubation puzzle with Intubating fibrescope

Madam,
We report a case of extubation failure following combined mandibulectomy and neck dissection) with free anterolateral thigh flap reconstruction. The airway was secured uneventfully with 7.0 mm nasal flexometallic endotracheal tube (ETT) and fixed at 25 cm. During surgical resection, constant oozing from pterygoid venous plexus warranted blind hemostatic suturing of pterygoid muscles in the infra-temporal fossa for haemostasis. Postoperatively, patient was kept on spontaneous respiration with retention of ETT. Morphine infusion (0.5-1.5 mg per hour) was monitored by Ramsay sedation score and visual analogue scale for sedation and analgesia respectively. On 1st post-operative day, after tapering morphine and inserting airway exchange catheter, resistance was felt while attempting extubation. To ascertain the cause behind the resistance, fiber optic bronchoscopy (FOB) examination revealed a suture passing through the ETT at 22 cm from the proximal end [Figure 1]. The further exploration of oral and nasal cavity and cutting of suture was planned under general anesthesia.

After oxygenation patient was anesthetized with sevoflurane and fentanyl. Laryngoscopy ruled out possibility of intraoral cutting of the retaining suture passing through the ETT due to the presence of another sutures and tissue edema. Hence, endoscopic removal of suture was planned. During the procedure, frequent and brief disconnections of breathing circuit was required, as opening of swivel connector was narrow and inadequate for concurrent insertion of fiberscope and endoscopic scissors. The endoscopic scissors forceps was passed deep down till the suture and negotiated across the suture for cutting it [Figure 2]. Thereafter, the ETT was rotated to ensure free movement over FOB and replaced 4 cm above the carina. Patient was shifted to post-surgical recovery area for further management.

The probable causes enumerated for unsuccessful extubation are: patient related factors like unrecognized subglottic stenosis or airway edema,[1,2] thick fibrous strands of mucous or organized retained blood clots, deviated nasal septum (DNS) causing resistance during the removal of endotracheal tube (ETT). Anesthesia related factors like kinking of ETT, incomplete deflation of the ETT cuff due to the malfunctioning of pilot balloon. Surgical factors like Krischner’s pins and sutures passing through the ETT could be rare possibilities. Likelihood of patient related factors could be easily excluded on CT scan examination and by the ease of passage of ETT through the nasal cavity during intubation. Fibrinous or mucous strands and organized clots were the least possible reasons, as extubation was attempted within the 24 hours of intubation, moreover, these weak strands could be easily broken out with minimal pressure. Malfunctioning of pilot balloon was ruled out as the inflation and deflation of the pilot balloon was possible. As, K-wire was not used intraoperatively, so it could not be the reason for resistance, hence passage of suture through the ETT was most likely possibility, which was confirmed on FOB. The routine passage of suction catheter down the tracheal tube lumen, intraoperative testing for tracheal tube movement and routine fibreoptic bronchoscopy through the tube when K wire fixation or blind surgical procedures occur in the vicinity of a tracheal tube have been recommended.[3,4]

Being a less invasive technique, and inability to localize the suture on direct laryngoscopy examination, endoscopic removal of the suture was planned. The prerequisite’s for endoscopic suture removal includes endoscopic instrument, clinician expertized in handling endoscopic instruments and a fine coordination between the clinician performing the endoscopy and anesthesiolist in the shared airway. The main concerns related to anesthesia management were, giving ample time to endoscopist for surgical

Figure 1: Suture passing across the lumen of endotracheal tube

Figure 2: Suture after cutting with endoscopic scissors
procedure and simultaneously prevention of the hypoxic episodes due to frequent disconnection of the breathing circuit. We prevented the hypoxic spells by using the 100% oxygen sevoflurane mixture, maintaining spontaneous respiration and facilitating the para-oxygenation by providing oxygen during instrumentation.

Extubation failure could be related to myriads of causes, suture through ETT is rare, but should be promptly addressed to prevent any untoward complication or injury to the airway. We also emphasize early use of check FOB for diagnosis and management of extubation difficulty, especially in the shared airway.

**Financial support and sponsorship**
Nil.

**Conflicts of interest**
There are no conflicts of interest.

**References**
1. Hartley M, Vaughan RS. Problems associated with tracheal extubation. Br J Anaesth 1993;71:561-8.
2. Divatia JV, Bhowmick K. Complications of endotracheal intubation and other airway management procedures. IJA 2005;49:308-18.
3. Yazbek-Karam VG, Haswani RW, Karam HS, Haddad WM, Youssef PS, Hachem BF, et al. Unusual case of difficult double-lumen endotracheal tube removal. J Clin Anesth 2009;21:514-6.
4. Lee C, Schwartz S, Mok MS. Difficult extubation due to transfixation of a nasotracheal tube by a Kirschner wire. Anesthesiology 1977;46:427.