

Accidental transection of flexometallic endotracheal tube during partial maxillectomy

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ABSTRACT

We report a rare case of an 18-year-old female patient in whom accidental sectioning of flexometallic endotracheal tube occurred during partial maxillectomy for mass lesion under general anaesthesia. She was managed successfully by tracheostomy.

Access this article online
Website: www.ijaweb.org
DOI: 10.4103/0019-5049.82689
Quick response code


Key words: Flexometallic tube, tracheostomy, transection

INTRODUCTION

An airway compromise can prove fatal during surgery under general anaesthesia if not recognised and managed in time. Rupture of cuff, damage to endotracheal tube (ETT) by surgical instruments, kinking of ETT and accidental extubation can compromise the airway. Transection of ETT is an extremely rare cause.

CASE REPORT

An 18-year-old female presented with gradually progressive intraoral swelling over the left palate since childhood. Apart from the swelling, she did not have any other complaint like pain or difficulty in swallowing. This was possibly the reason why she presented late. On local examination, the swelling was measuring 8 × 3 cm in size, hard in consistency, and nontender with irregular surface and margins.

The patient was assessed preoperatively as American Society of Anaesthesiologists (ASA) grade I. Preoperative investigations were as follows: Haemoglobin 13.2 g%, blood urea 14 mg/dl, serum creatinine 0.7 mg/dl

and blood sugar level (BSL) 70 mg%. X-ray paranasal sinuses was within normal limits.

She was posted for surgery under general anaesthesia. She was pre-medicated with injection Glycopyrrolate 0.2 mg intramuscular 45 minutes prior to surgery. All the preoperative vital parameters were normal. An intravenous line was secured with a 20-gauge cannula. She was pre-oxygenated with 100% O₂. Injection Ondansetron 4 mg, injection Ranitidine 50 mg, injection Midazolam and injection Fentanyl were administered as preinduction drugs. General anaesthesia was induced with Sodium Thiopentone and intubated under the effect of Scoline. Nasal intubation was done with 32 FG flexometallic ETT. After inflation of cuff, throat packing and fixing of ETT, anaesthesia was maintained on O₂ + N₂O and Isoflurane with Vecuronium as long-acting muscle relaxant. The patient was kept on intermittent positive pressure ventilation. All vital parameters were maintained in normal range during surgery. Injection Voveran was given intramuscularly to maintain analgesia.

During surgery, while cutting the portion of palate involved by the mass lesion with a Giglisaw, it was

How to cite this article: Ladi SD, Aphale S. Accidental transection of flexometallic endotracheal tube during partial maxillectomy. Indian J Anaesth 2011;55:284-6.

observed that the reservoir bag of Bain's circuit collapsed fully. Both the surgeon and the anaesthetist realised at the same time that this was due to complete transection of the flexometallic tube with the Gigli saw. There was difficulty in removing both the proximal and distal ends of the transected tube because of intact nylon rings. Hence, tracheostomy was performed by the surgeon within 90 seconds. We continued 100% O₂ through the same circuit. The oxygen saturation had dropped to 82% during tracheostomy. Portex 8 mm ID cuffed tracheostomy tube was used and the cuff was inflated with 6 ml of air. Intermittent positive pressure ventilation was continued with 100% oxygen. The patient stabilised within 3 minutes with oxygen saturation of 99%. Once the airway was established, cuff of the transected ETT was punctured and remnants of the flexometallic ETT were removed [Figure 1]. The surgery was continued and completed uneventfully in the next 30 minutes. All vital parameters remained normal during the procedure. The patient was reversed with injection Neostigmine and atropine intravenously and monitored for 30 minutes.

Postoperatively, the patient was conscious, responding to pain and obeying verbal commands with a pulse rate of 108/min and a BP of 126/80 mm of Hg. SaO₂ was 98% on air. She was shifted to ICU for observation and tracheostomy care.

On the 2nd postoperative day, she was transfused with one pint of blood as there was haematemesis on the same day that she was shifted to the ward.

On the 4th postoperative day, tracheostomy tube was removed. Further recovery was uneventful.

On the 9th postoperative day, the patient was discharged.

DISCUSSION

We faced an unexpected complication of ETT transection in a young patient. Airway compromise can be recognised by various signs. Collapse of reservoir bag or ventilator bellow is suggestive of a major leak in the anaesthetic breathing circuit. Other signs are smell of anaesthetic gas and sound of gas leak. Inadequate air entry on auscultation and absence of chest inflation are important monitoring signs. Hypoxemia and hypercarbia is seen.

Transection of ETT has been reported only once before in the literature. Murthy *et al.* have reported accidental



Figure 1: Transected flexometallic endotracheal tube

transection of 5.0 mm armoured nasal ETT with osteotome during surgery for Crouzon syndrome.^[1] In this case, transection was not immediately suspected and thorough examination of anaesthesia machine, circuits and laryngoscopy revealed no abnormality. The anaesthetic team decided to replace the ETT, and when it was pulled out, it was found to be transected. The remaining part was removed by doing a laryngoscopy and by using Magill's forceps. Reintubation was done with oral flexometallic ETT. The duration of partial ventilation was reported to be 10 minutes. The surgical time was 9 hours and the patient made an uneventful recovery with no hypoxic damage.

ETT cutting during neurosurgical operation has been reported by Chalkeidis *et al.*^[2] This involved a 32-year-old man posted for T12 to L3 spondylodesis surgery in prone position. The airway was secured with 8 mm internal diameter armoured oral ETT. Four hours after induction, there was a leak alarm at the ventilator. The cuff of the ETT was found deflated. After inflation of the cuff, the leak disappeared momentarily but reappeared in less than a minute. As the oxygenation was not compromised and the surgery was about to end, it was decided to carry on with the procedure. The leak disappeared as soon as the anaesthetist put his finger on the ETT inside the patient's mouth. The operation ended after 30 minutes with the anaesthetist's finger inside the patient's mouth. The ETT was replaced with a new one once the patient was in supine position. The tube was found to be bitten and cut at two points, one of them over the cuff's inflation tube. Unexpected intense contraction of the masseter muscle had caused cutting of the tube. The patient made an uneventful recovery.

In our case, it was difficult to remove both pieces of the ETT due to intact nylon rings; hence, it was decided to proceed with tracheostomy. As this was performed within 90 seconds, surgery could be completed and the patient did not suffer any hypoxic brain damage. Hasty attempts of ETT removal with intact but distorted nylon rings could have led to consequent hypoxia, aspiration and trauma to airway; hence, we proceeded for tracheostomy immediately.

In conclusion, transection of ETT is a rare complication which is potentially fatal due to airway compromise.

Early recognition is crucial for management. Immediate tracheostomy or replacement of the ETT is the option for successful management.

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Source of Support: Nil, **Conflict of Interest:** None declared