

Endotracheal Tube Obstruction with Foreign Body

Dr Sara Thomas, M.D.
Associate Professor, Department of Anaesthesia,
Christian Medical College, Vellore.
Tamil Nadu

The most important role of an anaesthetist in the conduct of general anaesthesia is endotracheal intubation and confirmation of its correct placement. Failure of this can happen and it mostly occurs due to misplacement, endobronchial intubations, disconnection, leaks, and obstruction either in the tube or in the circuit.¹

We report a case where there was obstruction of the endotracheal tube with a foreign body.

An 8 month old child weighing 8 kilogram was posted for excision of cystic hygroma on the right side of neck. The size of the swelling was small and was not causing compression to the surrounding tissues. The physical examination of the infant was otherwise normal. The child was premedicated with syrup trichloryl 75mg/kg. On arrival to the operating room he was asleep. Inhalational induction with halothane was started and Inj. atracurium was given after ensuring adequate mask ventilation. Direct laryngoscopy was performed and the child was intubated with a 3.5mm ID portex endotracheal tube. A metal stylet was used to reinforce the tube which was removed with difficulty. On connecting to the Jackson's Rees modification of Ayres T piece circuit, no chest movement was noticed or breath sounds were heard.

Immediately the tube was removed and the child was ventilated by mask. After adequate ventilation the child was reintubated with the same endotracheal tube but without the stylet. This was done by the senior anaesthetist and extreme care was taken to prevent dislodgement. Since the tube was well visualized in the larynx and there was no doubt of misplacement, the tube was fixed at the lips before connecting it to the circuit. When connecting to the circuit complete obstruction to ventilation was again experienced. The end tidal monitor was not in use for confirmation. A quick check laryngoscopy revealed correctly seated tube. The oxygen saturation was maintained during this time, hence before removing the tube again, we tried passing a suction catheter which met resistance at 11cms proximal to the bevel. This corresponded to the tube length at the lips. The tube was quickly removed and child was ventilated with mask. With a properly placed tube and the inability to pass the catheter made us strongly doubt the tube patency. Afterwards the child was intubated with another new 3.5mm endotracheal tube which solved all the above problems. The surgery and anaesthesia was uneventful.

The faulty tracheal tube was examined for the cause of obstruction. On trying to pass a stylet there was resistance at the 11cm mark which corresponded to site covered by the elasoplast. On removal of the tape a small white foreign body was visible in the lumen of the tube. We pushed this out with a stylet and it was found to be a small piece of micropore. (Figure 1 & Figure 2)

The probable cause of the foreign body was sought. We realized that the anaesthesia technician had affixed a piece of micropore on the stylet. While introducing the stylet initially into the tube, this small piece would have slipped down and got pulled away from the stylet. The technician had to exert force in retrieving the stylet. The failure to ventilate in the initial instance was thought to be oesophageal intubation and hence removed the tube. When the incident recurred we confirmed the tube position with a direct laryngoscopy. This added with the inability to pass the catheter was a strong indication to change the tube. It had been suggested by other authors that using new and transparent tubes will enable one to visualize the lumen and hence prevent problems². Unfortunately the foreign body in the tube was concealed by the tape and hence it was overlooked. Not using a stylet during reintubation left the block undetected. On the other hand the foreign body would have been pushed down the airway with more serious problems. In the event of an acute airway obstruction this possibility would not have been thought of. In our case we could follow the algorithm of COVER ABCD³ (the mnemonic stands for: C1:Circulation, C2:Colour, O1:Oxygen, O2:Oxygen Analyzer, V1:Ventilation, V2:Vaporizer, E1:Endotracheal Tube, E2:Elimination, R1:Review Monitors, R2:Review equipment, A: Airway, B: Breathing, C: Circulation, D: Drugs) and analyze the problem systematically. We were not constrained by time as the child could be ventilated adequately by mask.

In conclusion we would like to stress the importance of preoperative machine and equipment checks including mask, airway, endotracheal tube and stylet. Most of the problems are preventable, readily detectable and amenable to reversal if crisis management algorithm is applied promptly in time. This needs vigilance and careful observation among the whole team which includes both the doctors and anaesthesia technicians.

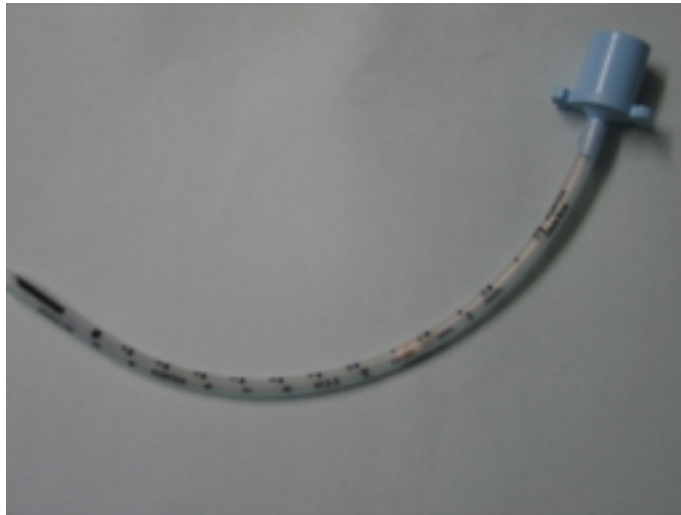


Figure - 1



Figure - 2

References:

1. Utting JE, Gray TC, Shelley FC. Human misadventure in anaesthesia. *Can Anaesth Soc J* 1979;26:472-478.
2. Foreman MJ, Moyes DG. Anaesthetic breathing circuit obstruction due to blockage of tracheal tube connector by a foreign body – Two cases. *Anesth Intens Care* 1999; 27:73-5.
3. Runciman WB, Webb RK, Klepper ID et al. Crisis management-Validation of an algorithm by analysis of 2000 incident reports. *Anesth Intens Care* 1993; 21: 579-92.