

CASE REPORT

Intraoral endotracheal tube kinking – a preventable problem

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CASE REPORT

An 18-year-old female sustained large right subdural haematoma. In view of Glasgow coma score (GCS) of 6/15 anaesthesia was induced with propofol 100mg, rocuronium 50mg in the emergency department. She was intubated with an oral cuffed polyvinyl chloride (PVC) 7.5mm internal diameter endotracheal tube (Unomedical, Malaysia). This was secured at 21 cm at the angle of mouth. Satisfactory endotracheal tube (ETT) tube position was confirmed by chest auscultation and sustained capnography. Anaesthesia was maintained with isoflurane 1-2% and 60% nitrous oxide in oxygen. The patient was ventilated with volume control ventilation using an AV-S ventilator using a circle system with gas flows of 2L.min⁻¹ and peak airway pressure of 17cm of water. Decompressive craniotomy was performed in the supine position with the head turned towards the left side.

Towards the end of the surgery the patient developed a tachycardia of 120bpm, and the airway pressure increased from 17 to 34cm of water. Capnography showed normal carbon dioxide levels, but a steep increase in the phase 3 slope suggesting partial airway obstruction.

We suspected obstruction of the ETT or bronchospasm. Pneumothorax and bronchospasm were excluded by chest auscultation and normal blood gas analysis.

There were no kinks or defects seen in the ventilator tubing or its connections. We could not pass a suction catheter through the ETT. The airway pressure improved slightly to 24cm of water when neck flexion was reduced. At the end of the surgery a kink was found in the intraoral section of the ETT, specifically where the pilot tube exits the main body of the ETT (Figure 1).

DISCUSSION

As demonstrated by this case, the most common site of a kink, is the site of exit of the cuff pilot tube,

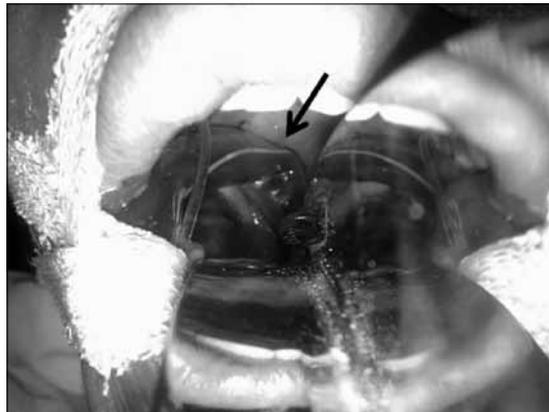


Figure 1. Laryngoscopy showing the kinked intraoral section of the ETT (arrow)



Figure 2. The ETT after extubation

usually 16cm from tip of the tube and within the oral portion of the tube. The stability of preformed curved endotracheal tubes is not usually compromised when bent along either inner concave bend or bent in the opposite side. However, if the ETT temperature is increased to 36°C, the softened tube tends to kink, even at low degrees of curvature.²

This problem may be prevented by use of armored or flexometallic ETTs where local manipulation or movement of the head is expected or if the ETT

Summary

Intraoral endotracheal tube kinking is not an uncommon phenomenon especially in the prone position¹ but there are very few reports of intraoral kinking in the supine position. We report a case where unexpected intraoral tube kinking during craniotomy caused an unacceptable increase in airway pressure.

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cannot be easily accessed during surgery (e.g. neurosurgery or facio-maxillary surgery) even in supine position. The anaesthetist should be aware of the risk of this complication, particularly if it is difficult or impossible to pass a suction catheter through the ETT. Use of lubricated Berman intubating airway, passed over the ETT, can relieve the intraoral kink during surgery.³

We propose that the design of PVC ETTs should be altered such that pilot tube exits the body of the ETT in a section of ETT that lies outside the oral cavity.

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CORRESPONDENCE

Superficial cervical plexus block for central venous cannulation

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Superficial cervical plexus block has been widely used for providing anaesthesia in procedures involving the neck region, for example carotid endarterectomy. We have experience of using this block to provide local anaesthesia for insertion of jugular central venous cannulae. It is a simple procedure in which expertise can be gained very quickly.

Anaesthetists are commonly asked to insert central catheters or dialysis catheters. These patients often have a history of repeated cannulations and the standard technique for local infiltration often involves several injections to cover the puncture and subsequent suturing. Apart from requiring multiple injections, distortion of local landmarks may also result. We have started performing these cannulations under superficial cervical plexus block and feel that patient satisfaction has improved compared with the conventional infiltration technique. It is a simple, easily-learned, safe and reliable block with relatively few complications.

Technique

With the patient's head turned away from the site intended for puncture, clean the skin with chlorhexidine in alcohol. The midpoint of the posterior border of sternomastoid is identified and using a 26G needle 10ml 2% lignocaine is injected for 2-3cm in both cranial and caudal directions along the posterior sternomastoid border. This will result in blockade of neural conduction in the ventral rami of the C1-4 nerve roots.¹

The area of anaesthesia typically spreads along the distribution of the transverse cervical (over the front of neck), greater auricular, lesser occipital (side of neck) and supraclavicular nerves (around the clavicle).

There are very few complications associated with this block as the injection is subcutaneous just like local infiltration. Avoid puncture of the external jugular vein which overlies this area in some patients. Spread to involve the phrenic, vagus, or glossopharyngeal nerve as well as the sympathetic chain is possible, but this is more frequent with a deep cervical plexus block. The same is true about the possibility of intra-arterial, epidural and intrathecal injection complicating this block.²

Because of its simplicity, ease and multiple advantages over conventional infiltration, we advocate that this block be used more often during central venous cannulation especially in patients with a history of multiple cannulations and particularly where a wide bore cannula ('vascath' for renal dialysis) is needed.

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