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LETTER TO THE EDITOR

Rare Event of Intraoral Kinking of Endotracheal Tube Upon Prone Positioning in a Patient Undergoing Posterior Fossa Surgery

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A 10-year-old patient (Weight-28kg, Height-150cm), diagnosed case of cystic posterior fossa space occupying lesion with hydrocephalus was posted for craniotomy and excision under general anaesthesia in prone position. The patient was previously operated uneventfully under general anaesthesia for left medium pressure ventriculoperitoneal shunt in supine position. After standard general anaesthesia induction, the patient was intubated with 6.5 mm-cuffed/poly-vinyl-chloride (PVC) endotracheal tube (ETT). Unavailability of a wire-reinforced ETT of the desired size forced us to use the PVC tube. Endotracheal position was confirmed by bilateral chest auscultation and capnography. The tube was fixed at 18 cm at oral margin after confirming the endotracheal location with flexion and extension movement of neck. The patient was ventilated on a volume-controlled mode and end-tidal carbon dioxide was maintained between 30 and 35 mm Hg. Baseline peak airway pressure was noted to be 17cmH₂O. Case specific necessary vascular access were obtained. The patient was positioned prone after taking due precautions and a peak airway pressure of 18cmH₂O was noted. Upon positioning of patient's head in Sugita head frame, peak airway pressures started to rise despite of maintaining two finger gap between chin and sternum, reaching a pressure limited peak pressure of 40cmH₂O. It was associated with a reciprocal decrease in tidal volume to around 50–70 mL and a parallel increase in end tidal CO₂ to a maximum of 60 mmHg. There was no associated

drop in saturation. The patient was immediately shifted to manual bag ventilation. Bilateral chest air entry was found to be equal but decreased and a poor respiratory compliance was observed. No signs suggestive of bronchospasm were appreciated. To rule out an obstruction in airway circuitry, we examined the whole extraoral circuit, but it was found to be patent. An attempt was made to pass the suction catheter down the endotracheal tube, but it was unsuccessful. Anticipating an endotracheal obstruction, a prompt decision was made to turn the patient back supine. The peak airway pressures reduced back to 17cmH₂O upon repositioning of the patient. A repeat laryngoscopy at this point showed the ETT to be kinked against the soft palate [Fig. 1]. The ETT was changed with a same size PVC tube and further course was uneventful.

Prone position is commonly employed for many surgical procedures including neurosurgeries, spine surgeries, urological procedures and in refractory ARDS patients. Endotracheal tube is a conduit to provide a secured airway to the patient. But in case of any equipment failure, it can cause catastrophic events. Any obstruction in ETT can cause disastrous consequences like hypoxemia, hypercarbia, pulmonary edema, and even cardiorespiratory arrest [1]. Kinking of an ETT is a known complication. Intraoral kinking is a rarer event [2,3]. It can pose a major troubleshooting standstill owing to the inaccessible view of the kinked portion and the rarity of its occurrence to cross the clinician's mind in the emergency scenario. The increased risk of kinking

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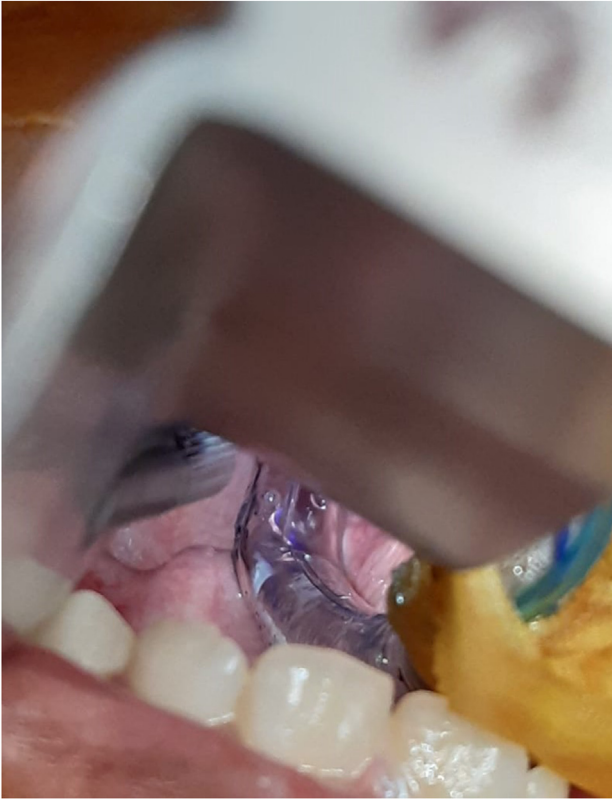


Fig. 1. Endotracheal tube kinked intra-orally in prone position against soft palate.

of the intra-oral segment of the ETT has also been attributed to the thermal softening of the tube [4]. Hariharan et al. observed that kinking of thermally softened tubes occurs more on bending it in the direction of the convexity of the tube than the concavity [3]. Similarly in our case, the prone positioning of the patient could have led to a force with the ETT impinging against the soft palate and acting in a direction perpendicular to the torque of the natural curve of the tube, thus kinking the tube. Though Ogden et al. have reported the use of a Berman airway to relieve the intra-oral kinking, its use remains limited by its availability and

accessibility [5]. We thus report this as a first such case of intra-oral kinking against soft palate in prone position.

Author contribution

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Conflict of interest

None.

References

- [1] Szekely SM, Webb RK, Williamson JA, Russell WJ. The Australian Incident Monitoring Study. Problems related to the endotracheal tube: an analysis of 2000 incident reports. *Anaesth Intensive Care* 1993;21(5):611–6.
- [2] Jain G, Barik AK, Panda S. A rare cause of intraoral endotracheal tube kinking in obstructive hydrocephalus. *J Anaesthesiol Clin Pharmacol* 2021;37(2):301–2.
- [3] Hariharan U, Garg R, Sood R, Goel S. Intraoperative kinking of the intraoral portion of an endotracheal tube. *J Anaesthesiol Clin Pharmacol* 2011;27(2):290–1.
- [4] Ayala JL, Coe A. Thermal softening of tracheal tubes: an unrecognized hazard of the Bair Hugger active patient warming system. *Br J Anaesth* 1997;79(4):543–5.
- [5] Ogden LL, Bradway JA. Maneuver to relieve kinking of the endotracheal tube in a prone patient. *Anesthesiology* 2008; 109(1):159.