Intraoperative kinking of the intraoral portion of an endotracheal tube

Sir,

Obstruction of the endotracheal tube can occur in various forms while the endotracheal tube is in situ. We report a new cause of intra-oral kinking of the endotracheal tube.

A 36-year-old, 55 kg, 158 cm patient was scheduled for modified right radical mastectomy for breast carcinoma. Anesthesia was induced with intravenous fentanyl (100 μg) and thiopentone (250 mg). Neuromuscular blockade achieved with vecuronium (5.5 mg) and trachea intubated with a 7.5 mm ID cuffed orotacheal tube (Rusch, Teleflex Medical Sdn Bhd, Malaysia). The tube was moved from the right angle of mouth and fixed on the left angle. The air entry was verified, by auscultation, to be bilaterally equal. The lungs were mechanically ventilated (volume-controlled mode with tidal volume 500 mL and respiratory rate 10 breaths/min) using Drager Primus Workstation (Drager Medical, Lubeck, Germany). The end-tidal carbon dioxide (EtCO₂) was maintained at 35-38 mmHg and the airway pressure was 16 cmH₂O. An hour after the start of surgery, airway pressures started rising and reached 44 cmH₂O. Surgery was stopped. Chest auscultation revealed normal air entry with no signs suggestive of bronchospasm. The breathing circuit and the extraoral portion of the tube were checked and no kink was observed. The cuff pressure was 22 cmH₂O. A suction catheter was passed through the endotracheal tube, but it could not be negotiated beyond the mid portion of the tube. Direct laryngoscopy was performed but no obvious kink was observed. The endotracheal tube was changed with a fresh endotracheal tube. On removal, an acute kink was observed about 10 cm above the cuff in a direction opposite to the natural curvature of the endotracheal tube (toward the convexity side) [Figures 1 and 2].

Intraoperative difficulty in ventilation may result from anesthetic gas delivery malfunction, obstruction of the breathing circuit, poor pulmonary compliance (extrinsic or intrinsic), acute bronchospasm, tension pneumothorax, or endobroncial mass lesion.[4] Kinking of the tube has been mentioned as a cause for difficulty in ventilation. Kinking of the endotracheal tube has been reported at the cuff portion and at the point of insertion of the cuff inflation tube.[3,5,6] We wish to highlight a new cause of intraoral kinking of the tube which occurred sometime after the tracheal intubation. The shifting of the endotracheal tube from the right to the left angle of mouth could have led to a force acting in a direction perpendicular to the torque of the natural curve of the tube, thus kinking the tube. Thermal softening of the tube, on exposure to body temperature, promoted the kink and lead to difficulty in ventilation.[7] We observed that kinking of thermally softened tubes occurs more on
bending it in the direction of the convexity of the tube than the concavity.

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**References**

1. Szekely SM, Webb RK, Williamson JA, Russell WJ. Problems related to the endotracheal tube: An analysis of 2000 incident reports. Anaesth Intensive Care 1993;21:611-6.
2. Gottschalk SK, Schuth CR, Quinby GE Jr. A complication of tracheal intubation: Distal kinking of the tube. J Pediatr 1978;92:161-2.
3. Singh B, Gombar KK, Chhabra B. Tracheal tube kinking. Can J Anaesth 1993;40:682.
4. Barst S, Yossefy Y, Lebowitz P: An unusual cause of airway obstruction. Anesth Analg 1994;78:195.
5. Lee YW, Lee TS, Chan KC, Sun WZ, Lu CW. Intratracheal kinking of endotracheal tube. Can J Anesth 2003;50:311-2.
6. Hubbler M, Petrasch F. Intraoperative kinking of polyvinyl endotracheal tubes. Anesth Analg 2006;103:1601-2.
7. Ayala JL, Coe A. Thermal softening of tracheal tubes. Br J Anesth 1997;4:543-5.