

Letter to Editor

# Straighten the neck when the tube is bent: Tackling endotracheal tube kink in the supine position

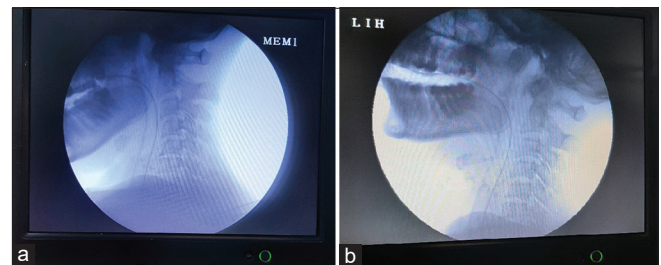
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Dear Editor,

A 45-year-old man with no prior history of any lung disease was operated on for a high parietal calvarial tumor. Intubation was done with a fresh size 7.5 polyvinyl endotracheal tube (ETT) -Portex manufactured by Smiths Medical. After anesthesia, the surgeon positioned the patient supine but with significant neck flexion to make the operative area the highest part of the surgical field. At the start of surgery, the airway pressure was 18 cm of water. About 50 min into the surgery (as the closure was starting), it was noted that there was difficulty in ventilating the patient, and the airway pressure was steadily beginning to rise and had reached 42 cm of water. The depth of anesthesia was adequate. Auscultation showed a decreased air entry in both lungs with no evidence of any bronchospasm. Obstruction in the external ventilatory circuit was ruled out. The cuff pressure of the ETT was also normal. A suction catheter was passed through the ETT to remove any possible secretions in the airway but could not be passed beyond 16 cm. Then, an X-ray was taken by the “C-”arm, which showed that the ETT was kinked at the posterior aspect of the tongue with significant narrowing of the lumen [Figure 1a]. Partial neck extension was then done without compromising the sterility of the operating field, and this opened up the tube somewhat although not fully [Figure 1b]. It was possible to achieve adequate ventilation without resorting to changing the tube, and the procedure was completed uneventfully.

ETT kinking is a known complication when *non reinforced* tubes are used in neurosurgical procedures done in the prone position with significant neck flexion.<sup>[1]</sup> Using armored (flexometallic) tubes may obviate this complication;<sup>[1]</sup> however, these tubes are not routinely used in surgeries done in the supine position. Even though airway pressures may be normal at the initial part of the surgery, it is known that with rising temperatures, the walls of the polyvinyl ETT get softened with a propensity to get kinked at areas where the



**Figure 1:** Initial intraoperative X-ray (a) with full-neck flexion showing endotracheal tube kink at the posterior aspect of the tongue and subsequent X-ray showing (b) opening up of the lumen partially with the extension of the head.

curvature changes<sup>[2]</sup> (as happened in this case at the back of the tongue) with resultant difficulty in ventilating the patient. In dire circumstances, the procedure needs to be stopped, and the literature describes either changing the tube,<sup>[3]</sup> passing a Berman intubating airway over the ETT,<sup>[4]</sup> or externally reinforcing the ETT with a shorter armored tube<sup>[5]</sup> placing over it to relieve the kink and achieve adequate ventilation.

While other causes leading to problems in ventilation, such as obstruction of the circuit, poor pulmonary compliance, bronchospasm, and tension pneumothorax,<sup>[6]</sup> need to be excluded in surgeries in a supine position, it must be remembered that intraoperative kinking of the ETT too may be the culprit. This can be easily confirmed by X-rays using the “C-”arm. Since the correction of the excessive neck flexion will not return a deformed tube to its original shape ideally, the surgery must be stopped, and the tube must be changed. However, the extension of the neck also may open up the tube lumen to allow adequate ventilation to proceed with the surgery<sup>[1]</sup> without any additional intervention as happened in our case. It is imperative that the surgeon always inform the anesthesiologist about how the patient will be positioned before the induction of anesthesia as good communication can prevent such a complication.

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### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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### Conflicts of interest

There are no conflicts of interest.

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