



Outer Diameter of Flexometallic Tubes: A Matter of Concern for Tube Exchange at the End of Surgery?

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To editor,

“Which tube and size?” is a common question asked during exchange of endotracheal tube (ETT). Postoperatively, we generally secure airway after multiple trials of tube reinsertion during exchange. Armoured endotracheal tubes (AETs) are generally used in head & neck and neurosurgical cases. Postoperatively, these patients are candidate for mechanical ventilation, for which the orally intubated AETs need to be replaced with polyvinyl chloride (PVC) ETT to prevent airway obstruction caused by biting.¹ Prolonged surgery causes airway oedema, and sometime, it is difficult to reinsert same size ETT. The ideal method used to change the AET is not available. Most experts first assess the airway using direct laryngoscopy, and if assume safe, it will proceed with ETT exchange directly under laryngoscopy or using bougie.

The American Society of Testing and Materials includes only internal diameter (ID) as a guide for selecting proper size of ETT.² AETs have slightly thicker wall (due to the embedded wire coil) as compared to same size PVC ETT with a difference of about 0.8-0.9 mm. For example, the outer diameter (OD) of 4.0 mm AET is 6.3 mm, whereas the OD of 4.5 mm PVC ETT is even lesser at 6.0 mm. Similarly, the OD for microcuff tubes is 0.2-0.3 mm more than that of PVC ETT. Therefore, inserting a microcuff tube of higher size or same size might become difficult while reintubation because of previous trauma. In a study by Al Mazrou et al.,³ the OD of the best fit ETT was less than internal transverse diameter (ITD) of trachea measured at the level of cricoid by 0.1-0.17 mm, and that the OD correlated better with age than height or weight. The significance of OD implicated in subglottis oedema, reintubation inflammatory oedema, long-term stenosis, subglottis oedema; however, literature is inclusive about this observation.

Appropriate size selection at the time of exchange becomes confusing as different manufacturers have different ODs, and we ultimately land up in selecting the tube after multiple trials and errors. During the time of exchange of tubes, we usually consider same ID ETT or even one size lesser ID, which has lesser OD and can result in postoperative air leak or achieving higher cuff pressures. Additionally, due to the increased airway resistance because of lesser ID, work of breathing also increases.

We recommend consideration of OD at the time of exchange of ETT, which can allow even a higher size (ID) endotracheal tube insertion.

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