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CORRESPONDENCE

Optimal size and length of the endotracheal tube for tracheal intubation via supraglottic airway devices

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To the Editor,

We read with interest and some concern the recent correspondence by Takenaka and Aoyama[1] regarding the optimizing endotracheal tube (ETT) size and length for tracheal intubation through single-use supraglottic airway devices (SADs). We believe the recommendations in this letter to the editor should be interpreted cautiously for the following reasons. First, in Table 1, the authors listed sizes 6.0 and 7.0 RAE^{TM} nasal ETTs (Mallinckrodt Medical, Athlone, Ireland). Although these ETTs are longer than the standard ETTs, they are used rarely in clinical practice for tracheal intubation through a SAD, because the distal acute curve can impede smooth insertion of the ETT through the SAD, and it can be difficult to remove the SAD along the ETT after successful intubation. In addition, RAE^{TM} nasal ETTs are generally not suitable for orotracheal intubation. Second, the authors only assessed the optimal length of ETT required for adequate endotracheal insertion through a SAD. In fact, the greatest challenge encountered when intubating the trachea through a SAD is removing the SAD after successful intubation without dislodging the ETT.[2] Since the appropriate length of an ETT is only somewhat longer than the sum of the length of a SAD airway tube and 10–11 cm, the proximal end of the ETT is about 3–7 cm above the proximal end of the airway tube when it has been inserted properly into the trachea through the SAD. With a narrow airway tube of 19–22 cm long, this can make it difficult to remove the SAD safely without dislodging the ETT. Third, other than its total length, another important factor of an ETT that can affect its smooth passage through the SAD is its outer diameter (OD). Although the internal diameter (ID) of the ETT is specified, the OD may vary between different manufacturers because of differences in wall thickness.[3] Moreover, because of the differences in design features (shape, ID, length of airway tube, and aperture bars) and manufacturers' materials, the capacity to admit passage of the ETT varies among SADs.[4,5] Therefore, the recommendations herein may be suitable only for the conditions tested by the authors.

Other than the intubating laryngeal mask airway, there are indeed important limitations of tracheal intubation through the SADs.[5] In view of these problems, we often prefer to perform tracheal intubation through the SAD using an Aintree intubation catheter (AIC) (Cook UK, Letchworth, Herts, UK) loaded onto a fiberoptic bronchoscope (FOB), as described in a previous study.[6] The AIC was designed specifically to aid fiberoptic intubation through a SAD. The device has an ID that allows it to be mounted onto a 4.0 mm FOB. At 57 cm in length, the distal 3 cm of the FOB remains exposed for unhindered manipulation. After the AIC is placed in the trachea and the FOB is withdrawn, the ETT is railroaded over the AIC into the trachea. This technique can avoid problems relating to incompatibility of the ETT with the SADs during intubation, because the 6.5 mm OD of the AIC allows railroading of an ETT with an ID $\geq$ 7.0 mm. Also, this device is likely to reduce the chance of the AIC being hindered at the cross aperture bars of the SAD, as it fits snugly over the FOB. In addition, railroading the ETT over the AIC is likely to be easier than using a FOB alone because of the greater OD of the AIC and the consequent reduction of the gap between the AIC and the ETT.[6] Some authors recommend this as a "low skill technique".[7] However, this technique does not

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allow direct placement of an ETT through the SAD and is likely to be time consuming.

Competing interests None declared.

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Reply

We thank Dr. Xue *et al.* for their interest in our recent letter to the editor.[1] It should be noted that tracheal intubation through supraglottic airway devices (SADs) is often performed in patients with a difficult airway. This is a lifesaving intubation technique, and it cannot be helped that there are several limitations regarding usable endotracheal tubes (ETTs). Alfery[2] has suggested the use of the RAE™ nasal ETT (Mallinckrodt Medical, Athlone, Ireland) for tracheal intubation through the SADs, and Benumof[3] has recognized that the preformed curve of the RAE™ tube does not present a problem. In addition, we have used the RAE™ tube for tracheal intubation through the SADs without difficulty.[4] Thus, we think that the distal acute curve of the RAE™ tube is of minor importance.

In many cases, there is no inherent reason to remove the SADs after successful intubation, except for the intubating laryngeal mask airway.[5] Leaving the SADs in place is often advantageous in case of a difficult airway.[5] Thus, we do not consider the method of removing the SADs as being important. Also, when removal was needed, we removed the SADs using 25 cm long forceps without dislodging the ETT.

We agree completely that the internal diameter and the length of the ETT are not the only important factors, as the outer diameter also affects smooth passage of the ETT through the SADs. The outer diameter of longer ETTs was shown in Table 1 of our recent letter.[1] In addition to analyzing these longer tubes, we examined passage of representative standard polyvinyl chloride ETTs (Mallinckrodt Medical, Smiths Medical, Parker Medical), and they were passed easily through the SADs that we assessed. However, attention should be paid to the outer diameter when using an ETT of different quality material, e.g., silicone. It is important to ascertain the compatibility between the commonly used SAD and ETT before using them in emergent settings for tracheal intubation.

Conflicts of interest None declared.

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