

## CORRESPONDENCE

7. Thiel A, Russ W, Zeiler D, Dapper F, Hempelmann G: Transcranial Doppler sonography and somatosensory evoked potential monitoring in carotid surgery. *Eur J Vasc Surg* 4:597-602, 1990
8. Kearse LA, Brown EN, McPeck K: Somatosensory evoked potentials sensitivity relative to electroencephalography for cerebral ischemia during carotid endarterectomy. *Stroke* 23:498-505, 1992
9. Rampil IJ, Holzer JA, Quest DO, Rosenbaum SH, Correll JW: Prognostic value of computerized EEG analysis during carotid endarterectomy. *Anesth Analg* 62:186-192, 1983

10. Silbert BS, Kluger R, Cronin KD, Koumoundouros E: The processed electroencephalogram may not detect neurologic ischemia during carotid endarterectomy. *ANESTHESIOLOGY* 70:356-358, 1989

11. De Vleeschauer P, Horsch S, Matamoros R: Monitoring of somatosensory evoked potentials in carotid surgery: Results, usefulness and limitations of the method. *Ann Vasc Surg* 2:63-68, 1988

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## Intubation through the Laryngeal Mask Airway

**To the Editor:**—The laryngeal mask airway (LMA) has achieved widespread popularity as a device for airway maintenance during routine procedures performed under general anesthesia.<sup>1</sup> Other uses for the LMA include its ability to allow blind or guided intubation of the trachea through its shaft with a high degree of success.<sup>2,3</sup> Unfortunately, most standard endotracheal tubes (ETT) are too short to guarantee tracheal intubation in all cases, because, when fully inserted, they often do not protrude far enough beyond the distal grille bars of the LMA to position the TT cuff safely below the vocal cords.<sup>4</sup> This problem is commoner in males than in females. We wish to report a solution to this conundrum that might be useful in situations when a cuffed tube must be used to secure the airway.

The size 3 and 4 LMA can accommodate a well lubricated uncut cuffed ETT up to 6.0 mm ID. Both sizes 3 and 4 LMA have the same shaft lengths (19 cm) and internal diameters (10 mm). A standard Mallinckrodt 6.0-mm oral/nasal ETT (St. Louis, MO) measures 28.5 cm from its tip to its proximal end. When fully inserted through a size 3 or 4 LMA *in vitro*, the upper border of its cuff lies 3.7 cm below the grille bars. Asai *et al.* reported that the distance from these grille bars to the vocal cords *in vivo* ranged from 2.5 to 4.7 cm in adult males and from 2.0 to 4.2 cm in adult females.<sup>4</sup> This suggests that the cuff of an uncut ETT often would lie between the vocal cords when fully inserted through the LMA, especially if the head were extended, leading to an incomplete seal or possible laryngeal trauma.

However, by employing a 5.0-mm Mallinckrodt Microlaryngeal Tube (MLT), with a length of 33.3 cm, successful tracheal intubation can be assured when using a size 3 or 4 LMA. This tube protrudes 13.2 cm beyond the LMA grille bars, allowing a distance of 8.2 cm from the bars to the upper border of the cuff. This should be adequate to allow placement of the MLT cuff completely below the vocal cords in all patients. Interestingly, the MLT packaging wrapper states that the tube length is "320 mm," but our measurements of one batch consistently revealed the true length to be 33.3 cm. Use of the 5.0-mm MLT may be even more appropriate in conjunction with the newly introduced size 5 LMA, which is 1 cm longer than the size 3 and 4 and has an internal diameter of 11.5 mm. If a 6.0-mm Mallinckrodt oral/nasal ETT were passed through the size 5 LMA, an

insufficient length would extend beyond the LMA grille bars to reliably position the ETT cuff distal to the vocal cords.

Other suggested solutions to the vexing problem of intubation through the LMA have included use of a Mallinckrodt Endotrol tube, use of a 5.0-mm Portex microlaryngeal tube (Hythe, Kent, UK), a shortened version of the LMA, the so-called ST-LMA (Intavent International SA, Henley-on-Thames, England), cutting off approximately 2 cm from the proximal shaft of the LMA and reinserting the connector, and deflating the LMA cuff after intubation, allowing about 0.7 cm further advancement of the ETT.<sup>4</sup> All these maneuvers have their limitations. The Endotrol tube is the same length as a regular 6.0-mm oral/nasal ETT. The Portex 5.0-mm microlaryngoscopy tube, although slightly longer at 30.5 cm, may not guarantee complete intratracheal placement of its cuff when passed through the LMA in some patients. The ST-LMA is 2 cm shorter than a conventional LMA but is not readily available in many institutions. Cutting 2 cm off the proximal end of the LMA shaft may not permit the tube to be successfully used subsequently on other patients. Resorting to the 5.0-mm MLT provides one further addition to the anesthesiologist's armamentarium when confronted with a difficult airway. Although the resistance to gas flow through this long narrow tube is higher than when using a conventional 6.0-mm TT, it permits oxygenation in these life-threatening scenarios and reliably protects the airway from aspiration.

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## CORRESPONDENCE

## References

1. Pennant JH, White PF: The laryngeal mask airway: Its uses in anesthesiology. *ANESTHESIOLOGY* 79:144-163, 1993
2. Heath ML, Allagani J: Intubation through the laryngeal mask: A technique for unexpected difficult intubation. *Anaesthesia* 46:545-548, 1991
3. Silk JM, Hill HM, Calder I: Difficult intubation and the laryngeal mask. *Eur J Anaesthesiol* 4(suppl):47-51, 1991
4. Asai T, Latta IP, Vaughan RS: The distance between the grille of the laryngeal mask airway and the vocal cords: Is conventional intubation through the laryngeal mask safe? *Anaesthesia* 48:667-669, 1993

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