IN REPLY

Rationale for a modified endotracheal tube for intubation using video laryngoscopy

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To the Editor,

We very much appreciate the thoughtful and constructive comments of Dr. Xue *et al.*¹ in response to our recent letter.² In that letter, we had described the problem of using a stylet to pre-shape the distal end of the conventionally designed, curved endotracheal tube (ETT) to facilitate tracheal intubation using a video laryngoscope (VL). Because of the curvature of this ETT, the tip of the ETT could become “hung up” on the anterior tracheal wall during retraction of the stylet, making advancement of the ETT into the trachea difficult. We proposed some features of a “VL tube” specifically designed for VL use that, when used together, might improve the success rate of intubations and reduce the complications associated with VL-assisted endotracheal intubation.

Dr. Xue and colleagues provided feedback and comments pertaining to our use of a C-MAC video laryngoscope (Karl Storz Endoscopy-America, Inc., Culver City, CA, USA) to investigate the degree of anterior translocation of a typical ETT *vs* a straight ETT. They rightly pointed out that other VL devices with a more angulated blade, such as the GlideScope® (Verathon Medical, Bothell, WA, USA) and McGrath® Series 5 video laryngoscope (Aircraft Medical, Edinburgh, Scotland), are more susceptible to the problem of ETT hang-up on the anterior tracheal wall. We certainly agree

and further suggest that the reduced degree of anterior ETT translocation seen with a straight ETT would be of even greater benefit when using these other devices. To that end, we are currently interested in examining the added benefit of this mode of delivery using more angulated devices such as those mentioned above. Dr. Xue and colleagues also stated that the “Macintosh-type blade of the C-MAC allows successful intubation without using a stylet,” citing the report by van Zundert *et al.*³ In that study, which involved patients with normal airways, the investigators reported that 93% of the tracheal intubations were successful using the V-MAC (predecessor of the C-MAC) without using a stylet. The investigators, however, also stated that “...presumably, this is due to the fact that the Storz VLS uses the same Macintosh laryngoscope blade as with direct laryngoscopy, providing a better view and better access, which decreases the need for stylet use....” In other words, it is likely that most of the tracheal intubations were performed under direct laryngoscopy, rather than indirect laryngoscopy (from the monitor display), using the V-MAC in that study. Nevertheless, the main point of our letter was to inform clinicians that, if a stylet ETT is used for tracheal intubation with a VL, a straight ETT would present less potential for a hang-up on the anterior tracheal wall during retraction of the stylet than the traditional, curved ETT.

Dr. Xue and colleagues had interesting questions related to the starting degree of bend that we used in our video demonstration of the degree of angulation of curved and straight tubes as they were released from a stylet. To demonstrate more fully the significantly reduced degree of potential anterior translocation of a straight *vs* a curved tube, we used an angle of 90° for both ETTs. Furthermore, in our preliminary investigations using a similar setup, the

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relative differences in potential anterior translocation were found regardless of the starting degree of bend for the two tube types.

In our letter, we proposed a variety of features that would be of benefit if incorporated into a modern “VL tube” for video laryngoscopy. They included (1) the lack of curvature “memory” (to obviate the need for warming or “reverse loading”); (2) the use of less-reflective materials to minimize glare when visualizing the tube using VL; and (3) use of a softer tip with an anteroposteriorly oriented bevel. Xue and colleagues pointed out that this third feature is commercially available in the Parker Flex-Tip® ETT (Parker Medical, Highlands Ranch, CO, USA). It continues to be our hope that all three features we identified will be brought together commercially to enhance the efficacy of VL in a variety of settings.

Conflicts of interest None declared.

Editorial Responsibility This submission was handled by Dr. Hilary P. Grocott, Editor-in-Chief, *Canadian Journal of Anesthesia*.

References

1. Xue FS, Yang GZ, Liu GP. Rationale for a modified endotracheal tube for intubation using video laryngoscopy. *Can J Anesth* 2016; 63. DOI: [10.1007/s12630-016-0663-5](https://doi.org/10.1007/s12630-016-0663-5).
2. Emsley JG, Hung OR. A “VL tube” for endotracheal intubation using video laryngoscopy. *Can J Anesth* 2016; DOI: [10.1007/s12630-016-0595-0](https://doi.org/10.1007/s12630-016-0595-0).
3. van Zundert A, Maassen R, Lee R, et al. A Macintosh laryngoscope blade for videolaryngoscopy reduces stylet use in patients with normal airways. *Anesth Analg* 2009; 109: 825-31.