References

- 1 Weiss BM, Zemp L, Seifert B, Hess OM. Outcome of pulmonary vascular disease in pregnancy: a systematic overview from 1978 through 1996. *J Am Coll Cardiol* 1998; 31: 1650–7.
- 2 Smedstad KG, Cramb R, Morison DH. Pulmonary hypertension and pregnancy: a series of eight cases. *Can J Anaesth* 1994; 41: 502–12.
- 3 Sandham JD, Hull RD, Brant RF, et al.; Canadian Critical Care Clinical Trials Group. A randomized, controlled trial of the use of pulmonary-artery catheters in high-risk surgical patients. *N Engl J Med* 2003; 348: 5–14.
- 4 Ermakov S, Hoyt JW. Pulmonary artery catheterization. *Crit Care Clin* 1992; 8: 773–806.
- 5 Tongers J, Schwerdtfeger B, Klein G, et al. Incidence and clinical relevance of supraventricular tachyarrhythmias in pulmonary hypertension. *Am Heart J* 2007; 153: 127–32.

Angled or curved stylet for intubation with the GlideScope®?

To the Editor:

I read with interest the study by Jones *et al.* evaluating effect of stylet angulation and endotracheal tube (ETT) camber on time to intubation (TTI) with the GlideScope® (GVL; Verathon Medical Inc., Bothell, WA, USA).¹ I commend the authors for their interesting study and comment on two aspects of the report.

The authors state that they compared 90° *vs* 60° angled stylets. The Figure in their manuscript displays two styletted ETTs studied. The first ETT has a straightforward shape with a 90° stylet angle. However, the second ETT gives the impression that the stylet was curved rather than angled, and that the angle within the curve is 90° and not 60°. The authors modeled this stylet by matching the angulation of the distal half of the GVL blade first (Figure A). At this stage, the stylet resembles the 60° stylet recommended by the manufacturer (Figure B).² The authors then added at least 30° of angulation by reproducing the proximal half of the GVL blade (Figure C). Even though the most distal part of this stylet has a 60° angulation, the angle contained within this stylet is a 90° angle. The logic for this lies in the differential positioning between the GVL blade and the stylet. The glottic view is obtained and the GVL blade is held static within the vallecula. The stylet is advanced alongside the blade until the tip reaches the glottis, which is in front of the GVL blade. This gives the impression that both the distal and proximal parts of the stylet curve are actively used in

FIGURE A) The initial 60° stylet angulation. Two tangential lines, one along the shaft and the other along the distal part of the endotracheal tube (ETT) curvature form a 60° angle. B) An ETT is loaded with the manufacturer's rigid steel stylet [GlideScope® (GVL - ST1), Verathon Medical Inc., Bothell, WA, USA]. This stylet is curved at a 60° angle. C) The curved stylet resembles the entire GVL blade, as used in the study.¹ Two tangential lines form a 90° angle.

the process of tracheal intubation. Therefore I believe that the authors actually studied the difference in TTI between a 90° angled and a 90° curved stylet.

My second comment relates to the experience mix of the anesthesiologists who performed tracheal intubations with the GVL. In the 90° group, 76% of operators were experienced and 24% were not.¹ In the 60° group, 65% of operators were experienced and 35% were not. In the absence of TTI for the experienced and non-experienced operators within each group, it is possible that the 13% reduction in the TTI in the 90° group could have been due in part, to the greater experience of operators in that group. It would be interesting to know the TTI for both the experienced and non-experienced operators. These additional data may help guide future investigators when planning similar studies.

Mirsad Dupanovic MD
University of Rochester, Rochester, USA
E-mail: Mirsad_Dupanovic@URMC.Rochester.edu
Accepted for publication February 7, 2007.

References

- 1 Jones PM, Turkstra TP, Armstrong KP, et al. Effect of stylet angulation and endotracheal tube camber on time to intubation with the GlideScope®. *Can J Anesth* 2007; 54: 21–7.
- 2 The GlideScope® Video Intubation System Operator and Service Manual. Available from URL; <http://www.virox.com/protocols/pdf/ManufacturersGlideScopeManual.pdf> (accessed January 26, 2007).

Reply:

We thank Dr. Dupanovic for his interest in our study. As mentioned in our manuscript,¹ we chose the two stylet angles to be studied based on the most common angulations used by anesthesiologists in our local practice. The distal 60° angulation used at our centre and in the study was heavily influenced by an expert in airway management who described using a stylet shape that closely approximates the shape of the GlideScope® blade.² We believe that these are clinically relevant stylet angulations that merit comparison to each other. Based on our study and the observations of others,³ we believe that the initial stylet configuration for orotracheal intubation using the GlideScope® should be 90°, as described in detail in our study.

We agree that experience is a potential confounding variable in airway instrumentation research, and this emphasizes the importance of randomization to equally distribute potential known or unknown confounders among the groups being studied. Since analyzing times to intubation (TTI) based on experience was not a pre-specified secondary outcome (and is therefore subject to the perils related to subgroup analysis),⁴ it was with hesitance and caution that we re-analyzed the data to

see if experience improved times to intubation in either the 90° or 60° groups (Table). Interestingly, experience of the operator did not seem to influence TTI in the 90° group, but markedly influenced TTI in the 60° group. If anything, this would tend to confirm the conclusion that the 90° stylet configuration is superior to the 60° configuration, especially when dealing with an inexperienced practitioner performing tracheal intubation with the GlideScope® videolaryngoscope.

Philip Jones MD FRCPC
Timothy P. Turkstra MD FRCPC
Christopher Harle MBChB FRCA
Kevin Armstrong MD FRCPC
London Health Sciences Centre – University
Hospital, London, Canada
E-mail: philip.jones@lhsc.on.ca

References

- 1 Jones PM, Turkstra TP, Armstrong KP, et al. Effect of stylet angulation and endotracheal tube camber on time to intubation with the GlideScope®. *Can J Anesth* 2007; 54: 21–7.
- 2 Cooper RM. Videolaryngoscopy in the management of the difficult airway (letter reply). *Can J Anesth* 2004; 51: 95–6.
- 3 Doyle DJ. Awake intubation using the GlideScope video laryngoscope: initial experience in four cases. *Can J Anesth* 2004; 51: 520–1.
- 4 Oxman AD, Guyatt GH. A consumer's guide to subgroup analyses. *Ann Intern Med* 1992; 116: 78–84.

Airway management for intra-oral surgery - airway first!

To the Editor:

We read with interest the airway management of a patient with an intra-oral dermoid cyst as described by Raveenthiran and colleagues.¹ While the authors should be congratulated for their successful management of an anticipated difficult airway, we seek some clarifications from them. The aspiration of contents of any oral swelling should be preceded by appropriate radiological evaluation, which has not been mentioned. It is not clear whether the large size of the needle used required local or topical anesthesia. It is also not clear if the aspiration was carried out using an extra-oral (e.g., submental) approach. Furthermore, these authors' conclusions and recommendations require a word of caution. Based on the experience from a single case, the conclusions may not be extrapolated to all intra-oral cysts. There are intra-oral

TABLE Comparison of 90° and 60° degree groups by level of experience

Comparison	Mean difference (95% confidence interval of difference)	P
90° experienced vs 90° inexperienced	- 0.01 sec (-14.85 to 14.83)	> 0.05
60° experienced vs 60° inexperienced	-17.1 sec (-30.6 to -3.6)	< 0.01

One-way ANOVA with Tukey-Kramer post test. Calculated in GraphPad Prism version 4.03 for Windows.