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Success Rate of Orotracheal Intubation *via* GlideScope® *versus* Direct Laryngoscopy in Manikin-Only–Trained Medical Personnel

To the Editor:—Nouruzi-Sedeh *et al.* demonstrated that diverse medical personnel who received only manikin training for tracheal intubation using the GlideScope® (GVL, Verathon Medical Europe, Ijsselstein, Netherlands) and Macintosh laryngoscope had significantly higher intubation success on a limited number of patients using the former technique (93% *vs.* 51%, respectively).[1] At first glance, this result may appear surprising, but a closer look provides an explanation and may provide some direction for future research on the subject.

In a study that examined learning of direct laryngoscopy (DL), Mulcaster *et al.* demonstrated that "proper insertion and lifting of the laryngoscope" are crucial to performance of tracheal intubation using DL.[2] They also concluded that teaching DL and tracheal intubation using manikins only is inadequate. In the current study, Nouruzi-Sedeh *et al.* point out that the main difficulty encountered by their inexperienced operators was attaining a Cormack and Lehane (C&L) Grade I or II view of the glottis.[1] Once attained, tracheal intubation was successful. When the operators only attained a C&L Grade III or IV view, intubation failed.[1]

Two studies comparing the Macintosh laryngoscope and the GVL have demonstrated improvement by one C&L grade laryngoscopic view in most patients using the GVL.[3,4] This difference seems to be exaggerated by manikin-only trained operators, and it was crucial for their success or failure of intubation in the current study.[1] In table 1, the authors report that operators have obtained C&L Grade I or II views in 92% of patients using the GVL, and only 50% of patients using DL. Because the figures of intubation successes and failures mirror the laryngoscopy figures, inability to display the glottis using DL resulted in a significant number of intubation failures in that group. However, when the attending anesthesiologists took over the intubations, they were able to obtain Grade I and II C&L views in all but one patient in each group, and were able to intubate all those patients. It seems that as soon as study candidates performed three laryngoscopies and successful intubations of a single manikin airway using each device, they qualified for study participation without exposure to simulated difficult airway situations that would eventually provide more experience before their exposure to real airways. Depending on the specific criteria for these variables, there may have been different final study results.

The real question raised by the results of this study is: "What methods should we use, and when should we introduce them to teach tracheal intubation to anesthesia trainees and nonanesthesiologists?" Intubation using DL has been a standard of care procedure for more than 60 yr. The availability of equipment is ubiquitous, it is less expensive, and its maintenance is easier and simpler than the GVL. Since introduction of the GVL in airway management, it has been demonstrated that DL provides the same success rate of orotracheal intubation within a shorter timeframe than the GVL when used by experienced operators.[3] However, two previous studies examining the pattern of learning DL, along with this study, have demonstrated that learning tracheal intubation using DL requires a longer training period than intubation using the GVL to achieve an intubation success rate of 90% or more.[2,5,1]

Based on their results, Nouruzi-Sedeh *et al.* conclude that use of the GVL may provide significant improvement in the rate of successful intubation for those who are learning how to intubate or those who only occasionally perform tracheal intubation. The authors may be raising a real dilemma here. I would agree that introduction of a videolaryngoscope early in training may provide an early additional airway management experience that temporarily provides better intubation success, and may enable attending physicians to guide tracheal intubation while observing the monitor. However, it may be concerning that there are nearly a dozen published reports regarding oropharyngeal soft tissue injury while intubating with the GVL.[6] To me, as a long-time DL user and an experienced GVL user, the latter device has been excellent as either the initial, backup, or rescue tool for anticipated difficult or failed intubation using DL. Early use of a videolaryngoscope in training of anesthesia personnel, however, may potentially cause slower and/or poorer development of DL skills because of limited exposure to difficult laryngoscopies using DL. Similar concerns have been voiced in Great Britain because of widespread use of the laryngeal mask airway. The other dilemma is whether we should teach the use of the GVL and laryngeal mask airway instead of DL to medical personnel who cannot get extensive airway management training on patients to master DL, and who perform tracheal intubations only on occasion. I believe that both these questions remain open until further research provides more scientific evidence.

In conclusion, use of DL for tracheal intubation is effective and efficient by experienced users, but requires a longer training period than the GVL for intubation success of more than 90%. Conducting further research into the issues raised by Nouruzi-Sedeh *et al.*'s study may inspire us to develop new and appropriate airway teaching models for anesthesia trainees and nonanesthesiologists.

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