force and pressure distribution using Macintosh and GlideScope laryngoscopes

editor—Carassiti and colleagues¹ are to be commended for their work attempting to compare the forces applied to the airway during laryngoscopy with the GlideScope Cobalt and the Macintosh laryngoscope. However, one issue deserves comment, there is an important difference between the two blades that was not accounted for in the placement of the force transducers or addressed in their discussion. The angulated blade of the GlideScope is different from the curve of the Macintosh blade. As a consequence of this, one might anticipate that forces generated by the blades may be in different locations of the blades. The transducers were placed in relatively similar positions on both blades. Because of the acutely angulated tip of the GlideScope and based on our clinical experience with the device, we believe that most of the force applied to the airway occurs at the very tip of the blade. This area is embedded into the soft tissue and transmits the forces generated by the laryngoscopist. This area was not covered by the transducer in the authors’ images and therefore puts into question their conclusions regarding forces generated by the two blade types. The Macintosh blade, because of its less acute curvature, has most of its force applied along the blade surface rather than the very tip as demonstrated in their paper.

Declaration of interest

None declared.

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reply from the authors

editor—we thank Drs Fiadjoé and Stricker for their comments and we are pleased to clarify some points. First, in our study, we used the GlideScope GVL, not the GlideScope Cobalt.¹ The observation is very interesting and suggests a systematic determination of the real contact surface between the blade and soft tissues in both laryngoscopy and videolaryngoscopy: as noticed by the authors, the higher curvature of the GlideScope could make the operator lift up the tissues by using the very tip. This aspect needs to be further investigated by placing a force sensor at the point of interest and monitoring the mean force or the force as a function of time during the manoeuvre. This would be original, as it has not been considered previously that the tip is the crucial point of interaction between the blade and tissues. In our present work, the suggested issue was taken into consideration at the outset, when the dimension and the placing of the area of interest were determined. The tip of the blades was not covered by the transducer for a series of reasons: the pressure film sensors used in this work to obtain a map of the pressure distribution with a very high resolution (1 mm²) cannot be folded to cover edges. Considering the authors’ comment about the covering of the tip, it would also imply the covering of the tip’s edge to measure most of the force. However, in terms of pressure, the contribution of small surfaces, like the tip, would not be negligible, but in terms of the force contributions, they are likely to be negligible. For example, we can consider the tip as a rectangular surface of 1 mm × 10 mm, that is, a surface of 10 mm². If a force of only 1 N (i.e. about 1/40 of the whole measured force) is exerted upon it, the corresponding pressure will be 1 MPa. The sensors used do not allow the detection of such a high pressure value. In the light of the previous work, in which the force acting upon the blade tip was measured exclusively, we have considered only the internal surface of the blade. Thus, our results are comparable with those described in the literature. This original observation, in respect of the previous work, could be the starting point for further investigations.

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