

## Correspondence

### *Efficacy of a combined technique using the Trachlight™ together with direct laryngoscopy under simulated difficult airway conditions in 350 anesthetized patients*

To the Editor:

Difficulty in airway management is the most important cause of anesthesia related morbidity and mortality.<sup>1</sup> This investigation aimed to evaluate the efficacy of the Trachlight™ (TL), used in conjunction with direct laryngoscopy (DL), for intubation in patients under simulated difficult airway conditions.

After obtaining Ethical Committee approval and informed written consent, 350 ASA I–II surgical patients (female/male: 181/169), aged  $47.3 \pm 15.7$  yr, without evidence of difficult intubation were enrolled. Patients affected by gastroesophageal reflux, asthma, obesity, and hiatus hernia were excluded.

DL was performed by anesthesiologists with greater than five years of clinical experience. Allowing the epiglottis to fall back and obscure the view of the cords simulated a Cormack grade 3 laryngoscopic view. Under DL, the TL was passed underneath the epiglottis. When an optimal transillumination was obtained,<sup>2</sup> tracheal intubation (TI) was achieved. If transillumination was not adequate,<sup>2</sup> the procedure was tried again. Only one additional manoeuvre (partial TL withdrawal and repositioning; TL alignment on the midline; neck flexion; external cricoid pressure) was permitted during a single attempt. A total of three attempts at TI were allowed.

Duration of intubation was defined as the time from the introduction of the laryngoscope in the mouth to the first positive capnography, excluding the time between two consecutive attempts. An independent observer recorded the duration, number of attempts, difficulties and complications of intubation.

The success rate after the first attempt at TI was 78% (273/350), with a mean duration of intubation of  $11.8 \pm 2.3$  sec. In an additional 16% of patients (56/350) TI was successful after the second attempt (total success = 94%): a faint glow was seen on the first attempt, but no additional manoeuvre was able to redirect the tip of the TL correctly so that a second attempt was needed (duration of intubation  $27.3 \pm$

2.1 sec). In an additional 6.0% of patients (21/350), TI required a third attempt (total success = 100%; duration of intubation  $38.1 \pm 3.3$  sec). No esophageal intubations were recorded.

The high rate (78%) of successful TI at the first attempt suggests that the TL may be a reliable adjunct for airway management in patients presenting a grade 3 Cormack view at DL.<sup>3</sup> In 16% of patients a second attempt was needed. In some patients, the angle of the lighted stylet was lost due to retraction of the inner stylet during the first intubation attempt. It is crucial to verify that the TL is prepared correctly and remains in this condition between attempts.<sup>2</sup> In 6% of patients a third attempt was needed, essentially because of difficulties in advancing the endotracheal tube (ET) in the trachea after withdrawal of the inner stylet. Retracting the stylet directs the ET upward and anteriorly and we think that the difficulties encountered could, possibly, be due to contact between the ET and the anterior laryngeal wall. Flexing the patient's head can help solve such difficulties.

No esophageal intubation occurred. We believe this is due to the meticulous attention paid to optimal transillumination before attempting to intubate the trachea.

In conclusion, we suggest that the use of the TL together with DL may be another useful alternative in the management of unanticipated difficult intubations.

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### References

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- 2 *Agrò F, Hung OR, Cataldo R, Carassiti M, Gherardi S*. Lightwand intubation using the Trachlight™: a brief review of current knowledge. *Can J Anesth* 2001; 48: 592–9.

- 3 Benumof JL. The American Society of Anesthesiologists' management of the difficult airway algorithm and explanation-analysis of the algorithm. *In*: Benumof JL (Ed). Airway Management. Principle and Practice. St. Louis, Missouri: Mosby, 1996: 143-56.

### *Cardiovascular responses to endotracheal intubation with the Bullard and the Macintosh laryngoscopes*

To the Editor:

Since the Bullard laryngoscope (BL) is anatomically shaped, it is considered less invasive than the Macintosh laryngoscope (ML) is. We compared cardiovascular changes following endotracheal intubation and times required for intubation between the two laryngoscopes.

After obtaining Institutional approval and informed consent, 30 patients without hypertension were studied. Endotracheal intubation was performed by BL (15 patients) or ML (15 patients), following induction of general anesthesia. Systolic and diastolic blood pressure (SBP and DBP), heart rate just before and one, two, three, four and five minutes after intubation were measured. The time required to visualize the glottis (T1), to place the tube (T2), and to complete intubation (T3) were recorded. All intubations were successful at the first attempt. The increase in SBP displayed a tendency to be smaller in the Bullard group than in the Macintosh group (12 mmHg difference, two minutes after intubation), but the difference was not statistically significant (Figure). There were no differences in DBP and in heart rate between the groups. Time to visualize the vocal cords, time required to place the endotracheal tube and time to complete intubation were significantly longer with the BL (7.7, 17.5 and 21.3 sec, respectively) than with the ML (5.3, 12.7 and 14.7 sec, respectively;  $P < 0.05$ ).

Although the time to complete intubation with the BL was statistically longer, the 6.6 sec difference does not seem clinically important. Although we were unable to demonstrate that the BL is less invasive in patients without hypertension, further studies (larger sample size; hypertensive patients) appear warranted.

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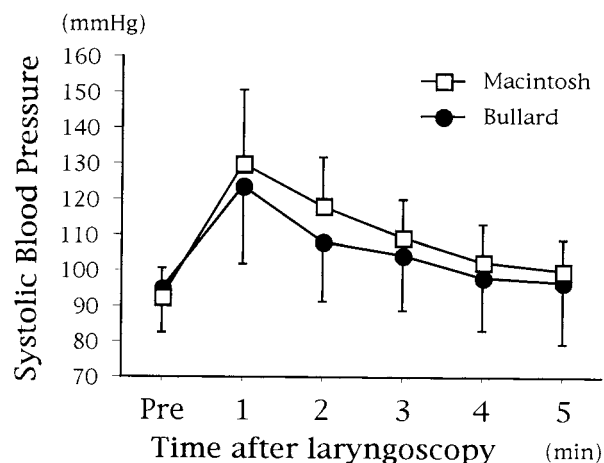


FIGURE Comparison of systolic blood pressure changes between the two laryngoscopes. Data are mean  $\pm$  SD. The difference was not significant between the groups.  $P = 0.051$  by repeated measure ANOVA. Pre = before intubation.

### *Positioning the double-lumen endobronchial tube*

To the Editor:

We read with interest an article by Fortier *et al.*<sup>1</sup> regarding new landmarks to improve the positioning of the left Broncho-Cath™ double-lumen tube (DLT). Through the bronchial tube and by transparency across the wall, the position of the DLT was adjusted so that the carina is midway between the black radiopaque line and the top of the bronchial cuff.<sup>1</sup> Through the bronchial lumen, however, the DLT appears to be located deeper relative to the black radiopaque line because the line of vision through the fiberoptic bronchoscope is almost vertical. Thus, the bronchial cuff must have been placed more proximally than intended by the authors. Figure 3 of the article<sup>1</sup> may be self-explanatory.

When a DLT is located within the margin of safety, defined as the difference between the length of the main bronchus and the length of the tube between the top of the bronchial cuff and the tip,<sup>2</sup> the DLT can be moved over the difference and still be correctly positioned. When the carina is at the level midway between the top of the bronchial cuff and the black radiopaque line, the tube length below the carina is about 35 mm, because the length of the bronchial tube of the DLT is 40 mm.<sup>3</sup> The possibility of the bronchial tube tip not being within the acceptable