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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 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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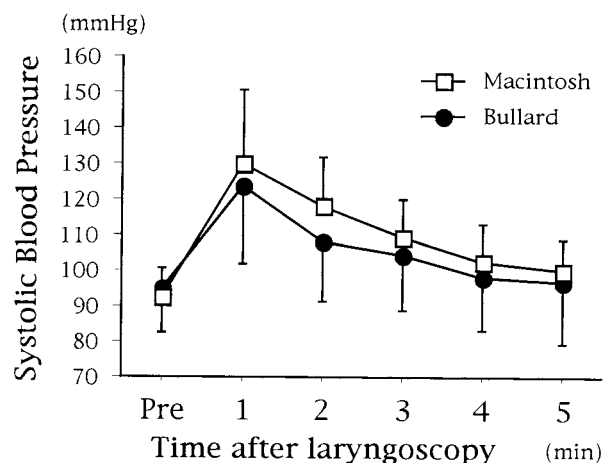


FIGURE Comparison of systolic blood pressure changes between the two laryngoscopes. Data are mean \pm SD. The difference was not significant between the groups. $P = 0.051$ by repeated measure ANOVA. Pre = before intubation.

Positioning the double-lumen endobronchial tube

To the Editor:

We read with interest an article by Fortier *et al.*¹ 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.¹ 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 article¹ 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,² 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.³ The possibility of the bronchial tube tip not being within the acceptable

range is < 2.5%,⁴ since, according to an *in vivo* fibre-optic bronchoscopic study,² the probability of occurrence of a less-than-35-mm left main bronchus is > 2 SD from the mean.⁴

It should be remembered that the new technique frequently works at the expense of the margin of safety, and that, though proximal displacements predominate, distal malpositions also occur during the positional change to the lateral decubitus.⁵ We suggest that fibreoptic bronchoscopy should be performed through both the tracheal and bronchial lumen of a DLT to check the position, and repeated after lateral positioning.

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References

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REPLY:

We thank Bahk et al. for their interest in and comments on our article.¹ Our results demonstrated that when using our new landmarks, the final position of left modified double-lumen tube (LM-DLT) seems better than with the classic positioning. We observed less need to reposition the LM-DLT proximally after turning the patient to the lateral decubitus. This technique is a reproducible and easy method to obtain these results.

Despite the fact that the vision is not always direct, we try to obtain the most perfect line of vision by curving the fibreoptic bronchoscope (FOB) as far as we can to visu-

TABLE Margin of safety of L-DLT

Tube	Position	MoS (mm)	Difference in mm
Conventional	classic	22	0
Modified	classic	25	+3
Modified	new	20	-2

Classic position is when the endobronchial is cuff just below the carina. New position is when the carina is midway between the endobronchial cuff and the black line.

Last column: the difference in mm between margin of safety relative to the conventional DLT in the classic position.

L-DLT = left double-lumen tube

alize the carina to assess the position of the LM-DLT following our landmarks. We would like to mention that Figure 3B of our publication is a schematic drawing and that the tip of the FOB should be deeper and curved in the LM-DLT to see the landmarks easily.

Our study found that the incidence of distal displacements and repositioning with our new technique is comparable to the classic technique. The new technique worked effectively at the expense of MoS (Table) but by only 2 mm. It seems quite acceptable to prevent difficult proximal repositioning of the LM-DLT after the patient has been turned laterally.

We agree with Bahk et al. that it is important to perform both tracheal and bronchial lumen FOB after the initial insertion and, mainly, through the bronchial lumen after lateral positioning, as was demonstrated in our study.

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Reference

- 1 Fortier G, Cot   D, Bergeron C, Bussi  res JS. New landmarks improve the positioning of the left Broncho-Cath™ double-lumen tube-comparison with the classic technique. *Can J Anesth* 2001; 48: 790–4.

Diagnosing endotracheal tube partial withdrawal vs cuff puncture

To the Editor:

Partial withdrawal of the endotracheal tube (ET) and cuff puncture are not rare occurrences.^{1,2} This *in vitro* study was performed to differentiate these two condi-