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Posterior-beveled vs lateral-beveled tracheal tube for fiberoptic intubation

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To the Editor:

The fiberoptic bronchoscope (FOB) or a gum elastic bougie are frequently used to facilitate tracheal intubation in patients with a difficult airway.¹⁻⁵ However, advancing the tube into the trachea over the flexible FOB or the gum elastic bougie may often be hindered at the level of the larynx. The present report compares the success rate of advancing a conventional left-beveled tracheal tube to that of two models of a posterior-beveled tube during oral fiberoptic tracheal intubation. The Figure depicts the bevel design of the three tubes used in the study.

Twenty-seven adult patients undergoing elective surgery were enrolled in the study. Patients having a history or suspicion of difficult tracheal intubation were excluded. Anesthesia was induced with *iv* propofol $2 \text{ mg}\cdot\text{kg}^{-1}$, fentanyl $2 \mu\text{g}\cdot\text{kg}^{-1}$, rocuronium $0.6 \text{ mg}\cdot\text{kg}^{-1}$. In all patients, an 8-mm Berman intubating airway was inserted before introducing the Olympus LF2 FOB (4.0 mm outer diameter). In Group I (17 patients), we compared ease of advance over the FOB of the standard left-beveled Mallinckrodt tube (Figure A) with the Parker Flex-Tip™ tipped tube (Figure B). In Group II, (ten patients) we compared advancing of the Mallinckrodt

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tube with the modified (by the authors) posterior-beveled tube (Figure C). In Group I, the success rate of advancing the tube on the first attempt was significantly higher with the Parker tube (13/17), than with the Mallinckrodt tube (7/17; $P < 0.05$). In Group II, the success rate was significantly higher with the modified Parker tube (10/10), than with the Mallinckrodt tube (5/10; $P < 0.05$). However, the incidence of successful advance of the Parker tube (13/17) vs the modified Parker tube (10/10) was not statistically different.

Advancing an endotracheal tube over a FOB into the trachea may be difficult in 23% to 46% of patients.² The factor implicated in the difficulty of advancement is the gap between the leading edge of the standard tube and the FOB. This gap allows the tip of the tube to catch on the right aryepiglottic fold, right vocal cord or the tip of the epiglottis. Alterations in the design of the tip of the endotracheal tube would be expected to influence the ease of advancing the tube over a gum elastic bougie or a FOB.³⁻⁵ The Parker Flex-Tip™ tube with its posterior-bevel and flexed tip is conceived to pass easily through the glottis. Our findings show that this is the case. This may be attributed to the posterior bevel of the tube per se, as was demonstrated by the success rate achieved with the modified posterior-beveled tube without the Parker tip. With the posterior-beveled tube, the tip of the tube lies anteriorly and stays in close contact with the insertion cord of the FOB, which makes the tube less likely to catch on any of the laryngeal structures.

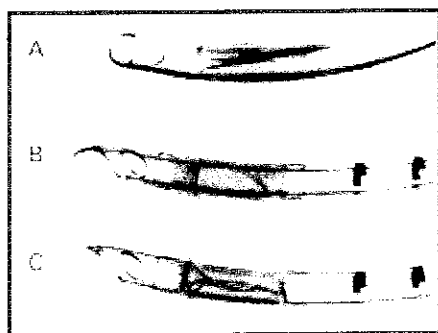


FIGURE The bevel design of the three tubes used in the study A, A standard left-beveled 7.5-mm Mallinckrodt medical tube (Athone, Ireland); B, A 7.5-mm Parker Flex-Tip™ endotracheal tube (www.parkermedical.com) which was designed to have a posterior bevel and an anterior flexible tip; C, A 7.5-mm posterior-beveled tracheal tube. The authors cut the anterior Flex-Tip of the Parker tube, the edge was then polished and the tube was resterilized.

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