
Airtraq laryngoscope has an advantage over Macintosh laryngoscope for nasotracheal intubation by novice laryngoscopists

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To the editor: Nasotracheal intubation is often required for dental and oral surgery. Direct laryngoscopy with a Macintosh laryngoscope, including the use of Magill forceps, is the most widely accepted method for nasotracheal intubation. However, this technique is somewhat difficult to master, especially by novice personnel who perform nasotracheal intubation only occasionally. The Airtraq laryngoscope (Prodol Meditec, Vizcaya, Spain) is a battery-powered optical laryngoscope, which provides a high-grade, indirect close view of the glottis without the need to align the oral, pharyngeal, and laryngeal axes. Increasing evidence shows this single-use laryngoscope offers potential advantages for tracheal intubation in routine and difficult airway management [1,2].

In a clinical study, we recently evaluated the ease of use of this device for nasotracheal intubation, and compared it with conventional intubation using a Macintosh laryngoscope and Magill forceps. After obtaining the Ethics Committee approval, we studied 20 patients who required nasotracheal intubation for surgical convenience. After the induction of anesthesia and establishment of mask ventilation, an endotracheal tube (Polar preformed tracheal tube; Portex, Keene, NH, USA) was introduced into the nostril, and either the Airtraq laryngoscope equipped with an external monitor [3] ($n = 10$) or the Macintosh laryngoscope ($n = 10$) was used. Allocation to the two groups was random, using sealed envelopes. Under visualization using the Airtraq or Macintosh laryngoscope, the laryngoscopist directed the tip of the endotracheal tube into the glottis. If the tube could not be passed through the laryngeal inlet, the Magill forceps were used to grasp the tube while an assistant advanced the tube by pushing on the nasal end. Each intubation was performed by a non-anesthesia physician with 1–2 months of training in airway management. A staff anesthesiologist supervised each laryngoscopy and an independent observer recorded the duration of nasotracheal intubation. The duration of nasotracheal intubation was defined as the time from interruption of intermittent positive pressure ventilation to connecting the endotracheal tube to an anesthesia circle. If the first attempt failed, the patient's lungs were ventilated again with 100% oxygen via bag-mask ventilation to ensure adequate oxygenation, and the

duration of the subsequent attempt was added to the time of the first attempt to secure the airway.

Patients in the two groups were comparable in age, weight, and height. Nasotracheal intubation was achieved in 65 ± 24 s (mean \pm SD; range, 43–115 s) using Airtraq laryngoscopy, while it required a significantly longer time, of 123 ± 70 s (range, 58–270 s) using Macintosh laryngoscopy with Magill forceps ($P < 0.05$; Student's *t*-test). No patient in the Airtraq group experienced esophageal intubation, while one resident performed an esophageal intubation in the Macintosh group. The incorrect tube placement was identified immediately and a staff anesthesiologist successfully established nasotracheal intubation. No patient experienced oxygen desaturation during laryngoscopy.

Our study demonstrates that, in comparison with the Macintosh laryngoscope, the Airtraq laryngoscope provides superior intubation conditions for personnel who are training in airway management, resulting in less time to secure the airway. There are several potential advantages of the Airtraq laryngoscope for novice laryngoscopists. First, an unobstructed view of the glottis is easily secured without the alignment of the oral, pharyngeal, and laryngeal axes, allowing the operator to more quickly visualize the target to which the nasotracheal tube is being directed.

Second, the anatomically shaped blade of the Airtraq laryngoscope distorts the anterior airway structures less than does the Macintosh laryngoscope. Reduced airway distortion can potentially create a more direct route from the nasopharynx to the tracheal inlet, necessitating less nasotracheal tube manipulation. In the present study, Magill forceps were not needed for any patient for nasotracheal intubation with Airtraq laryngoscopy. The use of the Airtraq lessens the chance of damage to the cuff of the tracheal tube caused by the grasping arms of the forceps.

Finally, the Airtraq provides a display of the intubation procedure for both the laryngoscopist and the supervisor. The magnified monitor view of the glottis is significantly better compared with a direct laryngoscopic view and helps novice laryngoscopists to recognize the anatomical structure. It seems to be a safe and beneficial approach for teaching and supervising tracheal intubation. The unobstructed view of the glottis helped the operator to complete the nasotracheal intubation while a supervisor provided instructions and suggestions to improve the coordinated effort. These factors may affect the time needed to successful intubation.

Increasing evidence indicates that a non-line-of sight view provides a good condition for nasotracheal intubation [4,5]. Nasotracheal intubation in the present study was performed by nonanesthesia physicians, and it should be noted that the time to secure the airway would not apply to experienced op-

erators. However, the potential advantages of this new laryngoscope were highlighted for nonanesthesia physicians, being inexperienced with tracheal intubation. The Airtraq laryngoscope enabled inexperienced physicians to reduce the duration of intubation attempts compared with the Macintosh laryngoscope. The use of the Airtraq laryngoscope will provide superior intubation conditions for individuals who are required to perform nasotracheal intubation only infrequently. Because our observations were drawn from a small number of examinations, further clinical studies are required to confirm these initial positive findings.

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