Use of the Airtraq as the primary technique to manage anticipated difficult airway: a report of three cases

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Abstract

The Airtraq laryngoscope (Prodol Meditec S.A., Vizcaya, Spain) is a new disposable optical laryngoscope designed to facilitate intubation in an uncomplicated or difficult airway. Its distinctive shape and its optical system can provide a full view of the glottis without the need to align the oropharyngeal axis. The use of this device as the primary technique to manage the airway of three patients with a previous history of difficult intubation related to difficult laryngoscopy is presented.

1. Introduction

The disposable Airtraq (Prodol Meditec S.A., Vizcaya, Spain) is a recently developed optical laryngoscope that was designed to facilitate intubation during difficult laryngoscopy. Its distinctive shape provides an indirect view of the glottis while a guiding channel directs the tube through the vocal cords without the need to obtain a direct alignment of the oropharyngeal axis (Fig. 1). Previous studies have suggested that the device is both effective and easy to use in patients with normal airways and in simulated difficult airways [1-5].

We report the cases of three patients with a known history of difficult laryngoscopy in whom endotracheal intubation was easily achieved with the Airtraq laryngoscope.

2. Case reports

2.1. Case 1

A 79-year-old man with chronic peripheral arterial disease was scheduled to undergo elective left femoropopliteal bypass surgery. Despite a normal upper airway examination (Table 1), he had had a prior difficult intubation during recent right lower limb bypass surgery. At the time, the best laryngoscopic view obtained by an experienced anesthesiologist was a Cormack-Lehane (CL) grade IV. Intubation failed after three attempts with different blades. Ventilation was
always easy and tracheal intubation was achieved with a size 5 intubating Laryngeal Mask Airway (ILMA; Orthofix Intavent, Maidenhead, UK). For the subsequent left-sided procedure, the patient refused regional analgesia and was considered too anxious to undergo awake fiberoptic intubation (AFOI). After obtaining his consent, we decided to secure his airway with the Airtraq.

2.2. Case 2

A 35-year-old man was scheduled to undergo an abdominoplasty of 5 hours’ duration. He had a body mass index (BMI) of 29.7 kg/m². Four years earlier, when his BMI was 49 kg/m², he had a difficult intubation during gastric bypass surgery. At the time, the best laryngoscopic view was a CL grade IV. Intubation failed after three attempts with different blades and was finally performed with a fiberoptic bronchoscope. His preoperative airway examination at our institution is detailed in Table 1. Because the patient had lost 64 kg, direct laryngoscopic view might have improved since the last surgery. Therefore, after obtaining the patient’s consent, we documented the current CL view by direct laryngoscopy and were prepared to use the Airtraq if the direct view was poor.

2.3. Case 3

A 43-year-old woman was admitted to the intensive care unit for status epilepticus. She had thrombotic microangiopathy, malignant hypertension, and end-stage renal insufficiency. Three days earlier, she was anesthetized for placement of a peritoneal dialysis catheter. At the time, the best laryngoscopic view was a CL grade III. Intubation failed after three attempts with different blades, finally being achieved via a size 4 ILMA. The patient was now uncooperative and required rapid intubation. To secure her airway, we elected to perform laryngoscopy using an Airtraq.

2.4. Management of the three patients

All patients were placed in standard “sniffing position” and preoxygenated for at least three minutes. An ILMA and a fiberoptic bronchoscope were ready for use in case of difficulties with the Airtraq. General anesthesia was induced with propofol and sufentanil. In all three cases, adequacy of bag-mask ventilation was checked before administering the muscle relaxant. Direct laryngoscopy with a size 4 metal Macintosh was first performed to confirm difficult direct laryngoscopy (no intubation attempt was made). Thereafter, a size 3 Airtraq laryngoscope

<table>
<thead>
<tr>
<th>ASA physical status</th>
<th>BMI (kg/m²)</th>
<th>TDM (cm)</th>
<th>IID (cm)</th>
<th>MP</th>
<th>MI CL view</th>
<th>AT CL view</th>
<th>Time to view (s)</th>
<th>Time to cuff inflation (sec)</th>
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</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>III</td>
<td>26.4</td>
<td>6</td>
<td>4.0</td>
<td>II</td>
<td>IV</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Case 2</td>
<td>II</td>
<td>29.7</td>
<td>5</td>
<td>4.5</td>
<td>III</td>
<td>III</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Case 3</td>
<td>IV</td>
<td>21</td>
<td>6</td>
<td>3.0</td>
<td>III</td>
<td>III</td>
<td>9</td>
<td>14</td>
</tr>
</tbody>
</table>

BMI = body mass index; TDM = thyromental distance; IID = interincisor distance; MP = Mallampati classification; MI CL view = Cormack-Lehane view with the Macintosh blade; AT CL view = Cormack-Lehane view with the Airtraq laryngoscope; time to view = time from Airtraq insertion to optimal view; time to cuff inflation = time from Airtraq insertion to inflation of the endotracheal cuff.
equipped with a video camera was inserted, and it provided a full view of the glottis in all three patients (Fig. 2). A size 7 or 8 endotracheal tube (ETT) was then easily inserted through the cords during video control on the first attempt. For all three patients, Table 1 provides details pertaining to airway parameters, direct laryngoscopic views, and intubation times with the Airtraq.

3. Discussion

We report three cases that illustrate the efficacy and the efficiency of the Airtraq to achieve endotracheal intubation in patients with a known difficult laryngoscopic view. The existing literature on the Airtraq is still scarce. Early reports suggest that it is efficient and easy to use, even by novices, in both normal and simulated difficult laryngoscopy [1,2,6]. In the clinical setting, the Airtraq appears to facilitate intubation in patients at low risk for difficult laryngoscopy and in patients with cervical spine immobilization [3,7]. Although promising, its use as a rescue device in unanticipated difficult intubation is currently limited to a report of two morbidly obese women undergoing cesarean delivery and to a case series of 7 patients [4,5]. The device may also be used to help assist tracheostomy in intubated patients with proven difficult airway [8].

The original difficult airway algorithm devised in 1991 by the ASA stated that, “If there is a good possibility that intubation and/or ventilation by mask will be difficult, then the airway should be secured while the patient is still awake” [9]. Because of its safety and its effectiveness, AFOI has thus become the “gold standard” in these situations. During the 1990s, the advent of supraglottic devices has prompted several authors to challenge this view, and supraglottic devices have been used as successful alternatives to AFOI in patients with anticipated difficult airways [10,11]. Alternative techniques such as the Trachlight (Laerdal Medical Corp., Wappinger Falls, NY) and the Bullard laryngoscope (Circon ACMI, Stamford, CT) also have been used in this context [12-14]. In 2003, the updated report of the ASA guidelines recognized the importance of supraglottic devices, but the algorithm still recommended that anticipated difficult airways be managed in an awake patient [15]. Current practice patterns indicate that most anesthesiologists who anticipate a difficult intubation due to difficult laryngoscopy will follow these guidelines and opt for an AFOI [16-18]. Nevertheless, the use of alternative techniques to secure the airway after the induction of anesthesia in such patients is slowly gaining acceptance among experts, provided that one is confident with the technique used [19]. We believe that with the recent development of videolaryngoscopic devices such as the Airtraq, this practice will become more widespread.

In contrast to other techniques, the Airtraq, the Pentax Airway Scope (Pentax Corp, Tokyo, Japan), the Glide-Scope (Verathon Medical Inc, Bothell, WA), and the McGrath laryngoscopes (Aircraft Medical Ltd, Edinburgh, UK) are easy to use and have a steep learning curve [1,20-23]. Clinical experience with the GlideScope is well documented compared with the more recent McGrath, Pentax, or Airtraq devices. However, the latter two may have some advantages over the others. The most common problem encountered with the GlideScope is the inability to direct the ETT toward the glottis, even with an excellent view [21]. The Airtraq and the Pentax, in contrast, are equipped with a guiding channel that directs the tube through the glottis once an optimal view is obtained. Their disadvantage is that they need to be perfectly lined up with the glottis, which may pose a challenge in some patients. Therefore, prospective studies comparing various videolaryngoscopes together and with other techniques are certainly warranted.

In conclusion, we describe use of the Airtraq laryngoscope in three patients with proven difficult intubation due to difficult laryngoscopy. We argue that in this situation the Airtraq may be a safe and effective primary technique to secure the airway. However, we would not recommend this alternative in patients with predictors of difficult ventilation [24], if a supraglottic device cannot be used (limited mouth opening), in those patients at high risk of aspiration, if an apneic period cannot be tolerated, or in patients with gross deformities of the upper airway.

References

Airtraq and anticipated difficult airway


