

Short communications

Orotracheal intubation with an AirWay Scope in a patient with Treacher Collins syndrome

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Abstract

Treacher Collins syndrome (TCS) is a congenital malformation of craniofacial development; in these patients conventional direct laryngoscopy is very difficult and often unsuccessful because of the upper airway malformation. A 20-year-old man with TCS was scheduled for elective tympanoplasty. The patient showed the characteristic facial appearance of TCS, and a difficult airway was anticipated. After careful anesthesia induction, direct laryngoscopy with Macintosh blade no. 4 of a direct laryngoscope failed to visualize the epiglottis, even with cricoid pressure, resulting in a grade 4 Cormack and Lehane view. Next, the AirWay Scope was easily inserted, and his glottic opening was clearly visualized. An 8.0-mm-internal-diameter tracheal tube was then advanced into the trachea without any difficulty. The AirWay Scope is a very useful airway device for oro-tracheal intubation; it provides an excellent view of the glottis without requiring alignment of the oral, pharyngeal, and laryngeal axes, and appears to be promising for use in patients with a difficult airway.

Key words Difficult airway · Airway management · Treacher Collins syndrome · AirWay Scope

Treacher Collins syndrome (TCS), a mandibulofacial dysostosis, is a congenital malformation of craniofacial development, and these patients may present with a difficult airway. The characteristic craniofacial abnormalities of TCS, which are derived from the first and second brachial arches, are hypoplasia of malar bones; palpebral fissure sloping downward and laterally with coloboma of the lower eyelids; micrognathia; malformation of the external, middle, and inner ear; and cleft palate [1]. Because of the upper airway malformation,

conventional direct laryngoscopy in these patients is very difficult and often unsuccessful.

The AirWay Scope (AWS; Pentax, Tokyo, Japan) is a novel airway device for oro-tracheal intubation that consists of the following three components: a charge-coupled device camera, a 2.4-inch built-in liquid crystal device monitor, and an anatomically curved blade (INTLOCK) that holds and guides the tracheal tube (TT). This device has been described in detail elsewhere [2,3]. Because the AWS provides an excellent view of the glottis without requiring alignment of the oral, pharyngeal, and laryngeal axes, it can be useful for managing difficult airways [4,5].

We report herein a patient with TCS whose trachea was successfully intubated using the AWS after direct laryngoscopy failed to expose even the epiglottis. A 20-year-old man, 175 cm, 40 kg, was scheduled for elective tympanoplasty for hearing disturbance due to malformation of the middle ear associated with TCS. He had no history of surgery, having been mistakenly told that surgical repair was impossible because of the difficulty of airway management during the procedure.

Routine preoperative tests showed no abnormality except for a low vital capacity (2030 ml; 46%). At preoperative examination, the patient's thyromental distance was 6 cm, his inter-incisor distance was 3.5 cm, and his oropharyngeal view was class 1 according to the classification system described by Mallampati et al. [6]. He showed the characteristic facial appearance of TCS, i.e., oblique palpebral fissure with coloboma of the lower eyelids, ear deformity, protruding teeth, and a small receding chin. A difficult airway was anticipated.

Standard monitors including ECG, a pulse oximeter, and a blood-pressure cuff were applied. His oxygen saturation by pulse oxymetry (Sp_{O_2}) was 99% in ambient air. Before the induction of anesthesia, we confirmed that the INTLOCK could pass through his oral cavity

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under topical anesthesia with 8% lidocaine spray. After preoxygenation with 100% oxygen with a face mask, 50 µg fentanyl was administered intravenously. His breathing condition was still stable, and general anesthesia was then induced with 50 mg intravenous propofol. His lungs were successfully ventilated with oxygen and 2% sevoflurane with a bag and mask, and 4 mg vecuronium was then given. Direct laryngoscopy with Macintosh blade no. 4 of a direct laryngoscope failed to visualize the epiglottis, even with cricoid pressure, resulting in a grade 4 Cormack and Lehane view. Next, the AWS was easily inserted, and his epiglottis was visualized on the monitor. The tip of the INTLOCK was advanced beneath the epiglottis and his glottic opening was easily visualized and positioned on the target mark. An 8.0-mm-internal-diameter TT was then advanced into the trachea, and the AWS was removed, leaving the TT in the trachea. His lungs were ventilated successfully. Correct placement of the TT was confirmed with capnography and bilateral chest auscultation. Throughout the process to visualize the glottic opening and to intubate the trachea using the AWS, which required less than 30 s, no difficulty was encountered and no strong upward traction of the pharyngeal structures was needed. The surgical procedure was completed uneventfully. The patient was extubated in the operating room without complication. The postoperative course was uneventful.

TCS can present one of the most challenging airways for anesthesiologists. The small and retrognathic mandible and posteriorly protruding large tongue seem to make it difficult or impossible to align oral, pharyngeal, and laryngeal axes and to directly visualize the glottic opening. Consequently, intubation with a conventional direct laryngoscope is extremely difficult. A variety of methods to maintain the airway in the patient with TCS have been described, including awake intubation [7], fiberoptic bronchoscopy [8], a laryngeal mask airway (LMA)[9], fiberoptic bronchoscopy through an LMA [10,11], a Bullard laryngoscope [12], an Augustine stylet [13], retrograde intubation [13], and tracheotomy. In addition to these methods, a lightwand, such as the GlideScope (Verathon, Bothell, WA, USA) and LMA-CTrack (LMA Inc, Singapore), might be useful.

In the present patient, after careful anesthesia induction, confirming that the lungs could be manually ventilated with a bag and mask, we successfully intubated his trachea using the AWS within 30 s, without any difficulty, as if his airway was a normal airway, despite direct laryngoscopy revealing a Cormack and Lehane grade 4 view.

The AWS is a novel airway device that has many advantages for performing rapid orotracheal intubation. First, it provides an excellent view of the glottis without requiring alignment of the oral, pharyngeal,

and laryngeal axes. Second, it is easy to operate. Indeed, Hirabayashi [3] has demonstrated that the success rate of intubation using the AWS by a novice resident is significantly higher, with a shorter intubation time (33 s on average) compared with that using a conventional direct laryngoscope. Third, the view of the glottis and the TT is maintained throughout the intubation process, which can be visually confirmed not only by the laryngoscopist but also by other people from behind and the side. Fourth, we believe that airway management can be achieved less traumatically with the AWS because the TT passage into glottic opening can be clearly observed; in contrast, a fiberoptic bronchoscope, a lightwand, and fiberoptic intubation through an LMA are “blind” techniques when we advance the TT into the trachea. Fifth, the AWS is fully portable, built all-in-one, with power supplied by 2 AA batteries, which is very handy.

There are some disadvantages to the AWS. The AWS cannot be used in patients with a highly restricted mouth opening. The cuff of the TT sometimes breaks, probably because of the friction between the cuff and the INTLOCK when advancing the TT. As the AWS has only one fixed-size blade, it can fail to reach the larynx [14]. The AWS can be used only with a TT sized 7.0–8.5 mm (8.5–11.0 mm outer diameter) so far. We hope that different-size INTLOCKS, including ones sized for children, will be available in the near future.

In conclusion, we successfully intubated the trachea of a TCS patient. The use of the AWS is very easy and it is a useful technique for orotracheal intubation, with an excellent view of the glottis, and it appears to be promising for use in patients with a difficult airway.

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