Case report

Pediatric video laryngoscope rescue for a difficult neonatal intubation

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Summary
Management of the airway in neonatal patients with craniofacial abnormalities or facial dysmorphism presents a challenge to health care providers. These patients may require specialized equipment and techniques to secure the airway safely. Video laryngoscopy with standard pediatric sized blades is a newly available and emerging technology and may serve as another tool when a potentially difficult airway is encountered. We report the use of a Miller 1 video laryngoscope for the intubation of a neonate with Desbuquois syndrome who had a poor glottic view by direct laryngoscopy.

Keywords: intubation: difficult airway; Desbuquois syndrome

Introduction
Management of the airway in neonatal patients with craniofacial abnormalities or facial dysmorphism presents a challenge to health care providers. These patients may require specialized equipment and techniques to secure the airway safely (1–3). There have been multiple case reports on the use of various laryngoscopes for direct visualization and the use of flexible fiberoptic scopes or rigid stylets for assistance with difficult intubations in neonates (4–7). Video laryngoscopy with standard pediatric sized blades is a newly available and emerging technology and may serve as another tool when a potentially difficult airway is encountered. (8) Pediatric video laryngoscopy may also be a valuable teaching tool for trainees learning intubation skills in neonates and infants (9). We report the use of a Miller 1 video laryngoscope for the intubation of a neonate with Desbuquois syndrome who had a poor glottic view by direct laryngoscopy. One other case of anesthetic management for a neonate with this syndrome has been reported; the patient was not intubated and the airway was controlled with a supraglottic device (10).

Case report
A 3-week-old neonate born at 36 weeks gestation (birth weight 2.2 kg) presented for trabeculectomy for congenital glaucoma requiring general anesthesia. The infant was diagnosed with micromelic dwarfism consistent with Desbuquois syndrome (Figure 1). The patient was receiving supplemental oxygen 1–2 L for desaturation and tachypnea. He had not been intubated during his first 3 weeks of life.

The patient was 2.1 kg on the day of surgery with physical exam notable for mid face hypoplasia,
microstomia and short neck. A small shoulder roll was placed to optimize head position. Mask induction with sevoflurane was performed with maintenance of spontaneous ventilation that was improved with bilateral continuous jaw thrust. With an equilibrated end-tidal concentration of sevoflurane equal to 1.5 MAC was obtained, 2.5 mg of propofol was administered intravenously. Direct laryngoscopy was attempted by a CA-I anesthesiology resident with a Miller zero laryngoscope resulting in a grade IV view. A faculty pediatric anesthesiologist attempted a second laryngoscopy with the same blade and had a grade III view. An endotracheal tube was passed but noted to be esophageal and removed. Laryngoscopy was then performed with a Miller 1 pediatric video laryngoscope (Karl Storz, Tuttingen, Germany) which displayed a grade I view of the glottis by video and a grade III view by direct vision. A 3.0 I.D. endotracheal tube was passed under video guidance and confirmed by auscultation and end-tidal CO₂ production. The surgical procedure was completed uneventfully and the patient was returned to the Neonatal ICU intubated.

Discussion

Desbuquois syndrome is an autosomal recessive form of micromelic dwarfism. It is characterized by the presence of short stature of prenatal onset, joint laxity, proptotic eyes, mid face hypoplasia, broad proximal femurs with enlarged lesser trochanters and advanced carpal and tarsal bone age. Additional findings include microstomia, micrognathia, short neck, small vertebral bodies, and thoracic hypoplasia. This patient also had unilateral, right-sided choanal atresia. Cardiac and urinary tract abnormalities may also be associated but were not present in this patient. Severe, potentially lethal respiratory insufficiency secondary to small thorax is not uncommon. Without aggressive respiratory and nutritional interventions, including tracheotomy and G-tube insertion, early death usually occurs. Joint hyperlaxity, including the cervical spine, requires attention while positioning and avoidance of extension as a potential cause of spinal cord injury (11).

Video laryngoscopy has been widely available for use with adult patients. Smaller devices that allow use of this technology in infants and neonates are now available. Two devices are currently commercially available: the pediatric video laryngoscope (Storz) and the GlideScope (Verathon, Bothell, WA, USA). There is one report of five cases of laryngoscopy with the neonatal GildeScope resulting in three successful intubations (12). There are no published reports for the use of either device as a rescue for a failed direct laryngoscopy in a neonate. One advantage of the video laryngoscope is that it allows visualization both by direct and video laryngoscopy. We decided to utilize the video laryngoscope early as a rescue technique, rather than attempt a third direct laryngoscopy, which may or may not have been successful. This provided a grade I view throughout insertion of the endotracheal tube that could be viewed by all. Previously, options for unsuccessful intubation by direct laryngoscopy in neonates have included flexible or rigid fiberoptic stylet intubation, use of an alternate (i.e. Bullard) direct laryngoscope, and intubation via an LMA or tracheostomy.

Conclusion

Video laryngoscopy may become a useful alternative when a neonatal difficult airway is encountered, as well as for training purposes in neonatal and infant airway management.
References


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