Case Report: Management of the difficult pediatric airway with a laryngeal mask airway, Guidewire, Cook airway exchange catheter and fiberoptic bronchoscope

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Introduction: One of the challenges faced in the management of the difficult pediatric airway is maintaining ventilation and oxygenation while securing the airway. Even though the laryngeal mask airway (LMA) addresses this issue, passing an endotracheal tube through the LMA becomes a major problem because of the short length of the endotracheal tube. In this case report of a patient with a known history of difficult intubations, we used a guidewire and a pediatric airway exchange catheter through the LMA to assist with the placement of the endotracheal tube.

Case Report: An 8 year old, 20 kilogram female was scheduled for various oculoplastics procedures (medial canthoplasty, modified Mustarde) lasting several hours. Her medical history was significant for Dubowitz syndrome, a rare genetic syndrome noted for intrauterine dwarfism, mental retardation, eczema and micrognathia. She also had multiple cervical spine abnormalities on MRI, although she had no symptoms. She had undergone multiple surgical procedures with difficult intubations accomplished by both direct laryngoscopy and fiberoptic bronchoscopy.

For this surgery, anesthesia was induced by mask with sevoflurane, oxygen and nitrous oxide. After placement of a 22 gauge intravenous catheter, a size 2.5 classic LMA was placed without difficulty. Once the position was confirmed by end tidal CO2 and breath sounds, a standard bronchoscope adapter was placed to allow ventilation during the placement of the endotracheal tube. An Olympus LF-P pediatric bronchoscope was placed into the LMA. When the vocal cords were visualized, 2ml of 4% lidocaine were sprayed on the cords. The fiberoptic bronchoscope was passed into the trachea. An Amplatz guidewire was passed through the channel of the fiberoptic bronchoscope into the trachea. After confirmation of the wire position, the bronchoscope was removed and a pediatric Cook airway exchange catheter with an internal diameter of 4.0 mm was passed over the guidewire into the airway. The LMA and the guidewire were then removed and a 4.5 uncuffed endotracheal tube was threaded over the catheter into the trachea. The position was confirmed by end tidal CO2 and breath sounds. The case proceeded uneventfully and the patient was extubated without incident.

Discussion: The LMA is an accepted means of managing the difficult airway in both adult and pediatric patients. Multiple techniques for conversion of an LMA to an endotracheal tube have been described, including blind and fiberoptic techniques for guidewire (1,2) and exchange catheter (3) placement, as well as direct placement over a fiberoptic bronchoscope (5,6). However, what we believe to be unique in our approach is the guidewire itself. The guidewire in the Cook LMA Airway Exchange Catheter Set is a 140 cm Amplatz guidewire, with one “floppy” end to reduce airway trauma (a known complication of guidewire techniques. We have found that the combined guidewire/exchange catheter technique has advantages over other techniques. One advantage of using a guidewire/exchange catheter technique versus only an exchange catheter technique is increased maneuverability of the fiberoptic bronchoscope. The rigid exchange catheters tend to decrease maneuverability of the fiberoptic bronchoscope. The Amplatz guidewire placed in the working channel of the fiberoptic bronchoscope does not have this limitation. This increased maneuverability means easier passage through the glottis with the bronchoscope—a critical maneuver for fiberoptic bronchoscopic conversion of an LMA to an endotracheal tube. The guidewire/exchange catheter technique is preferred to simply placing an endotracheal tube over a guidewire since the guidewire can “telescope” out during advancement of the endotracheal tube, causing esophageal intubation.
Conclusion: We report a case of successful endotracheal intubation via an LMA in a pediatric patient with a known difficult airway utilizing an Amplatz guidewire and an exchange catheter with a pediatric fiberoptic bronchoscope. Ventilation is maintained during airway manipulation allowing delivery of oxygen and anesthetic gases.

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