Case Report: Converting an oral endotracheal tube to a nasal endotracheal tube using two airway exchange catheters in a pediatric patient.

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Few case reports in the literature describe techniques to exchange oral endotracheal tubes to nasal tracheal tubes. In this report we describe a novel technique in which an oral endotracheal tube (ETT) was converted to a nasotracheal tube utilizing two Cook Airway Exchange Catheters, (CAEC, Bloomington, IN.), sewn end to end.

A 9-year-old male with extensive congenital venous-lymphatic malformations involving his left face, underwent sclerotherapy of his lower lip and neck in anticipation of resecting this tissue. After sclerotherapy, the oral endotracheal tube was left in place due to concern for airway edema. When the patient returned to the operating room the, oral ETT needed to be changed to a nasotracheal tube for adequate surgical exposure.

Anesthesia was induced using intravenous propofol, vecuronium bromide, and 100% inspired oxygen. Numerous attempts at direct laryngoscopy failed to visualize the glottic aperture secondary to airway swelling and secretions. Since the larynx could be visualized using a fiberoptic bronchoscope, the decision was made to intubate the trachea using a nasal fiberoptic technique. A 4 mm Cook Airway Exchange Catheter (CAEC) was utilized when removing the existing ETT. This provided a means of oxygenation and the ability to reintubate the trachea should nasotracheal intubation fail. Although there was clear visualization of the laryngeal structures, the nasotracheal tube would not pass through the glottic opening. The airway was then easily secured by sliding a new orotracheal tube over the CAEC.

Since the patient was hemodynamically stable and well oxygenated, the decision was made to continue with the ETT change incorporating the alternative technique. A 5.0 mm ETT was placed through the right nares into the nasopharynx. A 4mm CAEC was passed through this ETT and pulled out of the mouth using Magill forceps. Another 4mm CAEC was passed through the oral ETT, which was then removed. A 1-0 silk suture was used to quickly stitch the two CAEC’s end to end. The CAEC residing in the trachea was manually held in place in the posterior pharynx. The nasal portion of the now elongated catheter was slowly pulled back from the nares until it was straight in the posterior pharynx. The 5.0 ETT was carefully advanced over the catheter into the trachea without difficulty. Tracheal positioning of the new nasotracheal tube was confirmed with auscultation and capnography.

Discussion: The Cook Airway Exchange Catheter, (CAEC, Bloomington, IN), is a proven method of rapidly reintubating the trachea in difficult pediatric airways and was proven effective in this case. The major problem, in changing an oral ETT to a nasal ETT using a guided technique, is removing the oral ETT with the guide located within it. The CAEC has enough length to pass through the nasal passage, out the mouth, and down an oral ETT, but removing the oral ETT then becomes a problem. In a previous case report, removal was accomplished by literally cutting the ETT length-wise so it peeled away from the CAEC. In this case we elected to stitch two CAEC’s end-to-end, once the endotracheal tube was removed. An adapter can be utilized to insufflate oxygen, monitor capnography, or for jet ventilation. Another report describes the use of a Patil extender, which is also made by Cook. The Patil adapter screws the two ends of the catheters together in the middle, similar to the described sewed technique. However both of those ETT exchanges were performed in adult patients. There have been no previous reports of this endotracheal exchange technique in the pediatric population.

Management of the difficult pediatric airway requires a combination of skill, knowledge, assistance, and appropriate airway equipment. The environment is often stressful and difficult if preparation and planning are not strictly adhered. In this case we were able to monitor the position of the endotracheal tube or the CAEC with capnography and to provide oxygenation. Care must be taken with utilization of the CAEC, as complications are still possible. There have been reports of airway trauma, bronchial rupture, desaturation, and cardiac arrest with airway exchangers. Equipment for alternate techniques to secure the airway should always be readily available.

References: