Pediatric Dental Sedation Complicated by Severe Epistaxis, Laryngospasm, and Pneumomediastinum

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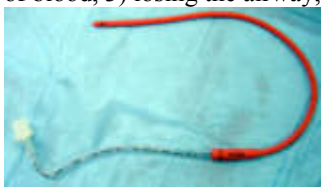
Introduction: Nasal endotracheal intubation or trumpet insertion for dental work in children offers benefits for the dentist not available with oral techniques (the tube is out of the way, the bite can be easily checked, and there is less chance of dislodgement). Many providers of sedation hesitate to instrument a child's nasal passages due to concerns about trauma to delicate vascular structures which will be displaced by tube passage and possible epistaxis even in experienced hands (1). In my experience of 3,500 sequential pediatric nasal intubations using the technique of passing an 18F red rubber catheter (2) as a guide for the non-warmed endotracheal tube, there was no clinically significant bleeding until the case described below.

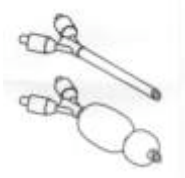
The patient was 7 years old, 19 kg, severely autistic, and had multiple congenital anomalies. Sedation in a dental facility was induced with inhalation sevoflurane. The patient breathed well spontaneously with an oral airway and mask strapped in place. Monitors and I.V. were uneventfully placed. Propofol 7 mg/kg, dexamethasone 0.15 mg/kg, and ketorolac 0.5 mg/kg were injected. The right naris was infused with oxymetazoline 0.05% 0.15 ml and then filled with glycerin jelly. Mask ventilation was moderately difficult, and one breath was given. The 18F red rubber urethral catheter was passed and used as a guide for the easy passing of a 5.5 mm preformed nasal endotracheal tube. Laryngoscopy revealed the mouth overflowing with blood. The blood was removed and immediately refilled the mouth. Intubation with continuous suction failed because the larynx was submerged in blood. The nasal endotracheal tube was removed, and ventilation by mask failed. Succinylcholine was administered and ventilation by mask was achieved with difficulty, and the bleeding rate remained brisk. After three attempts at intubation orally using a styletted 4.5 cuffed endotracheal tube, the trachea was intubated, and the bleeding stopped. Succinylcholine was given three times in total. Oxygen saturation was adequate throughout. The trachea was suctioned with minimal return of blood. The procedure was completed, the patient was extubated awake, observed for 90 minutes, and discharged home. Later that day, the patient was admitted to a hospital for observation, and chest x-rays revealed free mediastinal air. Fiberoptic endoscope examination of the larynx revealed no abnormalities. The patient was discharged home from the hospital after 36 hours of observation and antibiotic treatment.

Results and Discussion: This case illustrates the hazard of unforeseen problems in an office practice. The management of the patient's moderately difficult airway became tremendously more challenging when compounded by potentially exsanguinating epistaxis. In this case, there was probably submucosal emphysema of the oropharynx and glottis which further impaired laryngoscopy before the air decompressed, dissecting down to the mediastinum. The usual treatment for posterior epistaxis (posterior packing and possible tamponade with a Foley catheter) is impossible to implement when dealing with concurrent laryngospasm and inability to intubate because of bleeding. In a child, there may even be inadequate room to insert a forcep holding the packing in a nasal passage partially occupied by an 18F Foley catheter. The bleeding must stop or slow before intubation will be possible. If the bleeding does not stop promptly, the patient may aspirate enough blood to cause permanent obstruction of the tracheobronchial tree. Cricothyrotomy and placement of a cuffed tube would prevent this, and allow definitive management of the epistaxis, but cricothyrotomy carries its own significant risks and would need to be done early in the management to prevent aspiration of blood. One would not like to have performed the cricothyrotomy only to find the nasal bleeding stopped spontaneously.

The solution to this clinical situation is a medical device sold as "EpiStax" (3). It is an 8 cm long, 18F, hollow, latex-free tamponade device. It is small enough to fit in the nose of even a 10 month old child. According to the package insert, "The EpiStax is a two-balloon catheter with two independently inflatable balloons designed to control intra-nasal hemorrhage. The smaller balloon marked '10cc' is designed to control bleeding in the posterior chamber, while the larger balloon marked '30cc,' controls bleeding in the anterior chamber." When I find myself in this situation again, I will immediately insert and inflate the Epistax's two balloons and intubate orally thereby eliminating the risk of 1) exsanguination, 2) massive aspiration of blood, 3) losing the airway, 4) cricothyrotomy, and 5) pneumomediastinum.



Endotracheal Tube and Guide Catheter



EpiStax Deflated and Inflated

Refs: (1) Elwood T. et al., Anesthesiology, 2002
(2) Allegiance Urological Catheter, [Distributed by Cardinal Health, McGaw Park, IL 60085-6787]
(3) Micromedics, 1270 Eagan Industrial Road, St. Paul, MN 55121-1385, USA, www.micromedics.com