Staged extubation over airway exchange catheter of a difficult nasal retrograde intubation in patient with congenital myopathy

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Disclosures: The authors have no conflicts of interest to report.

Introduction:

Staged extubation planning for difficult pediatric intubations refers to the maintenance of access to a patient’s airway even after removal of an endotracheal tube (ETT), in order to facilitate ease of reintubation if necessary. This is a rarely described technique in the pediatric literature, but increasingly crucial for the most difficult of intubations.

Case Description:

A 19 year old female with congenital myopathy and respiratory failure who is ventilator dependent on continuous nasal BiPAP presented for emergency endoscopy for hematochezia and ultimately required an unplanned retrograde nasal intubation after several failed attempts with conventional and advanced intubation techniques. After 4 post-operative days remaining intubated in the pediatric intensive care unit (ICU) the patient was ready for an extubation trial with transition back to nasal BiPAP. However, the patient had refused tracheostomy as means of airway access in the case of ventilatory failure. The patient was brought to the operating room for extubation where she was minimally sedated with midazolam. She was then administered IV lidocaine and topicalized with lidocaine via suction catheter passed blindly through her 5.0mm nasal rae ETT as a bronchoscope was unable to make the necessary curve. An 11 Fr airway exchange catheter (AEC) was then placed through the side-port of a standard bronchoscope Y-adapter piece while maintaining ventilation, and then the ETT was removed with immediate placement of nasal BiPAP ventilation. Capnography was obtained via the AEC to monitor adequacy of ventilation and the patient was able to verify respiratory comfort on nasal BiPAP and tolerance of the AEC in place. The patient was then transported back to the ICU where she tolerated the AEC for 48 hours before it was removed due to low likelihood of requiring re-intubation as well as increased secretions.

Discussion:

Despite the widespread emphasis on intubation planning and the use of algorithms there has yet to be a set guideline for the process of extubation. However, the American Society of Anesthesiology Task Force on Difficult Airway Management does recommend a preformulated strategy for extubation of the difficult airway (1). As the difficulty of airway access increases, it seems logical that more conservative strategies should be implored for extubation planning, considering reintubation rates may approach 26% in certain settings (2). In the case of exceptionally rare airway access techniques such as retrograde intubation, extubation planning may necessitate maintenance of access to the airway via an AEC, especially in cases such as the one described here where the patient refuses a surgical airway. Having an AEC in place does not guarantee ease of reintubation but it significantly increases first-pass success rates for known difficult airways and decreases many of the complications associated with failed intubation attempts (2). The use of an AEC may also allow for earlier assessment of extubation tolerance, thus decreasing ventilator days, morbidity and cost (3).

References: