Cricothyroidotomy Skills Maintenance Program

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Case

A seven-year-old, previously healthy, child (Figure 1) presented to our emergency department with facial swelling and a fever to 39°C. He was able to tolerate PO intake, but had a sore throat and difficulty swallowing. A CT of his neck was obtained which, with clinical presentation, suggested Ludwig’s Angina. He was started on antibiotics and steroids, admitted to the Intensive Care Unit and intubated for airway protection.

The infection continued to worsen necessitating surgical drainage in the operating room (OR) by the Pediatric Otolaryngology service the following day. His postoperative course was complicated by two self-extubations over 48 hours, requiring re-intubation by the Pediatric Anesthesia call team who found it increasingly difficult.

Ultimately, the infection subsided and he was electively extubated in the OR 5 days from the initial presentation. He was discharged home 2 days after being extubated without further sequelae.

Quality Improvement

This near-miss situation highlighted a deficiency in our current practice with regards to having a standardized method of handling the cannot-intubate, cannot-oxygenate (CICO) emergency in the pediatric population. Many rationalize this deficiency is due to the low incidence of difficult airways in the ORs (0.25-3%), however, a recent study found the incidence of difficult intubation to be 10.6% in inpatient wards and the emergency department (2).

Clearly, it is essential that all anesthesiologists acquire and maintain the knowledge and skill to efficiently navigate a pediatric airway emergency. As a result of our case, as well as other recent near-misses at our institution, we are developing a Cricothyroidotomy Skills Maintenance Program (CSMP) (Figure 2).

Needs Assessment

The first step in developing our CSMP was to determine the baseline knowledge of our providers when asked how to manage a pediatric difficult airway, focusing on the final intervention: the front-of-neck access (FONA).

A Needs Assessment Questionnaire was created (Figure 3) and administered to 83% attending anesthesiologists and 67% CRNAs by a Pediatric Anesthesiologist over a 2 week period. As suspected, there was a basic understanding of how to proceed during a CICO scenario, but an uncertainty as to where the equipment was located as well as a hesitancy to initiate FONA due to infrequent exposure to the necessary equipment.

Using the information gathered by our Needs Assessment, we are now working with our Adult Anesthesia airway experts and our Pediatric ENT colleagues to standardize our algorithm in the CICO scenario as well as our CSMP. The CSMP will be a regular simulation session with a mannequin and our FONA kit.

The goal is for all potential airway emergency responders to understand the skills and equipment needed to proceed with FONA and prevent hypoxia-related morbidity and mortality in this rare circumstance.

Ongoing Efforts