Title: Iatrogenic Endotracheal Tube Obstruction with Foam Face Padding

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ABSTRACT BODY:

Introduction: Obstruction of endotracheal tubes by foreign bodies has been reported in the past. A variety of mechanisms have been described, including dislodged pieces of equipment such as lighthwands, suction catheters and carbon dioxide sampling tubing. We present a case of iatrogenic endotracheal tube obstruction from a piece of foam face padding.

Case Report: A 23-month-old, 14 kg boy presented for circumferential release of left clubfoot. He was otherwise healthy with normal growth and development. Past surgical history was significant for posterior medial release for the same problem approximately ten months prior to this operation. On preoperative evaluation, the patient was noted to have an upper respiratory infection (URI) that was considered mild. He had no fever, cough or rhinorrhea and lungs were clear to auscultation bilaterally. The rest of his preoperative exam was unremarkable.

He was taken to the operating room, standard monitors were placed and he underwent mask induction with sevoflurane and nitrous oxide. A 22-gauge IV was started in the left hand. Propofol was administered, and direct laryngoscopy with a WisHipple 1.5 blade revealed a grade I view. A 4.0 cuffed endotracheal tube (Mallinckrodt, St. Louis, MO) was inserted and sustained end tidal CO2 (ETCO2) was noted. The patient was placed on pressure-controlled ventilation (PCV). Shortly thereafter decreased tidal volumes were noted. We had difficulty ventilating the patient upon attempting assisted ventilation, and auscultation revealed coarse breath sounds. Albuterol was administered via the endotracheal tube, and passage of an 8F soft suction catheter (Airlife Tri-Flo with port, Cardinal Health, McGaw, IL) returned a small amount of clear-yellow secretions. ETCO2 and tidal volumes returned to normal.

The patient was disconnected from the anesthesia circuit and positioned prone for the procedure. His face was placed on a foam pad (Pediatric Gentletouch 4”, Orthopedic Systems, Inc., Union City, CA), and the circuit was reconnected (see photo 1). Shortly after reconnecting the circuit, ETCO2 and tidal volumes decreased to zero, and breath sounds were absent. Positive-pressure ventilation by bag was ineffective. A kink in the tube was suspected, and the patient’s head was repositioned, with no improvement in ventilation. An 8F soft suction catheter was again inserted and upon withdrawal of the catheter, a white foreign body was noted in the endotracheal tube. The foreign body migrated distally with attempts at ventilation, and could not be withdrawn with the 8F catheter. A 10F soft suction catheter was passed, and the foreign body was retrieved. The patient’s oxygen saturation remained above 96% and his heart rate above 100 throughout this time. Tidal volumes and ETCO2 returned to normal, and the rest of the case was uneventful. Upon further inspection, the foreign body was a 12 x 4 x 5 mm piece of white foam (see photos 2,3). At the end of the procedure, a small gouge in the foam face pad, near the premade passage for the endotracheal tube, was noted and was equal in shape and size to the foreign body (see photo 4).

Discussion: There are numerous case reports of foreign bodies recovered from airways, endotracheal tubes, and anesthesia circuits. There are fewer reports of anesthesia equipment obstructing the endotracheal tube. There may be a higher risk with smaller pediatric tubes, as demonstrated by this incident and those cited above. The step of disconnecting and reconnecting the endotracheal tube to the circuit always entails the risk of subsequent complications as the integrity of the circuit is temporarily disrupted. Visual inspection of the circuit should always be undertaken after any disconnection. However, in our situation, only the connector piece of the
endotracheal tube was readily visible.
The foreign body was initially thought to be a mucus plug, since our patient did have a recent URI and mild ventilatory difficulty at the beginning of the case. We were fortunate that positive pressure ventilation did not push the foam into the bronchial tree, which could have caused more serious complications and required bronchoscopy for retrieval. We are not aware of another instance of this specific complication, despite foam pads being used commonly for surgery in the prone position.

Refs: