Endoscopic sinus surgery performed on a healthy young male could have resulted in a fatal outcome when a surgically placed nasal pack became dislodged upon extubation and unknowingly was aspirated.

Unlike the “missing” nasal packs or posterior pharyngeal packs placed intraoperatively, this particular pack was to remain in place 12 to 24 hours postoperatively, status postseptoplasty. At the conclusion of the case and after extubation, all visible knots, ties, and steri-strips appeared to be intact. However, the patient displayed signs of hypoxia and stridor. Excessively high ventilating pressures were required to oxygenate the patient with the subsequent need for an emergency reintubation.

A diagnosis of foreign body aspiration was made. Using the fiberoptic bronchoscope, it was discovered that one of the packs placed intraoperatively had indeed become dislodged and aspirated into the tracheal bronchial tree. This became a life-threatening situation with the patient showing signs of compromised oxygenation, hypercarbia, tachycardia, and hypertension. The combined efforts of the surgeon, the anesthesia team, and the operating room personnel allowed for the prompt retrieval of the foreign body using the fiberoptic bronchoscope equipment.

Key words: Aspiration, endoscopic sinus surgery, fiberoptic bronchoscope, foreign body, and nasal packing.

A 16-year-old white male presented as a same-day admission for an elective septoplasty, functional endoscopic sinus surgery, and partial turbinectomy.

Preoperative assessment revealed a 67 kg, 6 feet, 1 inch tall male, ASA physical status I with a history of asymptomatic mitral valve prolapse. Ampicillin 1.5 g intravenous (IV) was given preoperatively. Laboratory values included hemoglobin 16.0 g per 100 mL, hematocrit 46.5%, and platelet count 163,000 per µL. Prothrombin time and partial thromboplastin time were 13.1 seconds and 27 seconds respectively.

Routine monitors, including a pulse oximeter, lead II electrocardiogram, skin temperature probe, precordial stethoscope, and a noninvasive blood pressure monitor were applied. A 20-gauge IV cannula was in situ from the short stay unit. After
preoxygenation for 3 minutes, an IV induction including fentanyl 250 μg, midazolam 2 mg, followed by propofol 150 mg and rocuronium 35 mg, preceded an uneventful intubation with a 7.5 mm internal diameter (ID) endotracheal tube. Anesthesia was maintained with desflurane 6% to 8% in 100% oxygen. Intravenous ondansetron 4 mg was given as an antiemetic after induction, as well as metoclopramide 10 mg, to increase gastric motility. The patient was placed on a ventilator with settings of a tidal volume of 800 mL and rate of 10 breaths per minute with 18 cm H2O peak ventilating pressure. Vital signs remained stable throughout the 45-minute operation.

Upon conclusion of the surgical procedure, a Merocel® pack lightly coated with bacitracin ointment was inserted into the osteomeatal complex and then inflated using 1% lidocaine with 1:100,000 epinephrine. This was secured to the outside of the face with tape, and the remaining aspects of the right and left nostril were packed inferiorly using gloved Telfa® packs coated with bacitracin ointment. Silk ties (3.0) knotted to each pack were secured across the columella and knotted four times. These packs would stay in place 12 to 14 hours postoperatively to tamponade any bleeding (Figure 1).

At the completion of the operation, the rocuronium effect was reversed with neostigmine 2.5 mg and glycopyrrolate 0.4 mg. Desflurane was turned off, and the patient’s oropharynx was suctioned for small amounts of bloody mucous drainage. Spontaneous respirations returned within 5 minutes after desflurane was discontinued. The patient was extubated and an attempt was made to orient the patient. The patient became combative; he sat up, pulled on the intravenous tubing and nasal packing. Inspiratory stridor was noted, and the patient’s color became progressively cyanotic with an SpO2 reading of 60%. Oxygen (100%) via face mask was immediately applied, and attempts were made to ventilate the patient. The patient’s color continued to deteriorate, and the SpO2 monitor progressively fell to a low of 40%.

Succinylcholine 100 mg IV was given followed by immediate endotracheal reintubation with a 7.0 mm ID endotracheal tube. Attempted hand ventilations via the breathing circuit after reintubation became almost impossible with airway pressures greater than 70 cm H2O, breath sounds absent over left chest, and very distant breath sounds over right chest wall. The SpO2 monitor increased from 85% to 87%, while the ETCO2 continued to increase, rapidly approaching 60 mmHg. Blood pressure (BP) was 170/100 mmHg and heart rate (HR) was 120 beats per minute. Attempts to ventilate the patient were extremely difficult. Using two hands for ventilation and approaching dangerously high peak pressures of 70 cm H2O, the anesthesia team was able to maintain an SpO2 of 85%

The initial diagnosis made was bronchospasm. Halothane 1% was started, a metaproterenalin inhaler 6.5 mg was instilled through the endotracheal tube, and hydrocortisone 100 mg was administered IV, all with no alleviation of symptoms. The fiberoptic bronchoscope equipment cart was ordered to the room immediately. Vital signs at this time were BP 170/100, HR 130, SpO2 80%, and ETCO2 55 mmHg. Labetolol 5 mg was given IV and repeated again in 5 minutes to treat hypertension. Midazolam 3 mg was also given at this time. A pediatric fiberoptic scope was used initially because of the 7.0 mm ID endotracheal tube already in place. Upon passage of the scope, a foreign body was identified just beyond the endotracheal tube and above the carina. The surgeon identified the foreign body as one of the gloved telfa packs placed intraoperatively. This pack was one of the two packs consisting of a finger cut off a latex glove filled with telfa and sutured with a 3.0 silk and knotted at the base of the nose externally (Figure 2).

Manual ventilation through the anesthesia circuit remained difficult secondary to high peak pressures ranging from 60 to 70 mmHg. Progressive and persistent hypercarbia became a problem, prompting the decision for diagnostic bronchoscopy. The potential of compounding the problem...
with a pneumothorax or barotrauma secondary to the high ventilating pressures was a definite concern.

The decision was made to change the 7.0 mm ID endotracheal tube to an 8.0 mm ID endotracheal tube to allow the passage of a 20 mm ID fiberoptic bronchoscope to facilitate instrumentation with forceps to retrieve the foreign body. At this time, the patient was given rocuronium 20 mg to provide a quiet field to allow instrumentation.

Vital signs remained unchanged, other than a persistent elevation of $\text{ETCO}_2$ to 78 mmHg during the changing of the endotracheal tube size to an 8.0 mm ID size. Because of the size of the dislodged pack, should the surgeon grasp it with the forceps through the bronchoscope, it would not fit through the 8.0 mm ID endotracheal tube. It was decided to remove the pack and the endotracheal tube together, then immediately reintubate the patient. It took three attempts of grasping the pack before it was removed with the forceps through the bronchoscope. Magil forceps were positioned at the glottic opening in anticipation of dislodgement of the pack from the forceps at this time.

Immediately upon retrieval of the foreign body, the patient was reintubated with another 8.0 mm ID tube. At this time, airway pressures immediately returned to normal levels (20 cm H$_2$O), SpO$_2$ was 99%, the $\text{ETCO}_2$ was 40 mmHg, BP was 120/70 mmHG, and the HR was 94 beats per minute. A chest x-ray was done at this time which was negative. The total time from initial emergent intubation to foreign body retrieval was 45 minutes.

Halothane was discontinued and the patient was given a reversal of neostigmine 2.5 mg along with glycopyrrolate 0.4 mg IV. Spontaneous respirations resumed, and the patient was suctioned for small amounts of mucous drainage. The patient was reactive to verbal commands and was extubated. No respiratory difficulty was observed, and the patient was transferred to the recovery room and later discharged to his room after 50 minutes.

Discussion

Endoscopic sinus surgery is being performed on a routine basis in the operating room. Nasal packing of all types is being used, left in place postoperatively, and is being removed in the surgeon's office, usually the following day. The actual positioning and the potential complications of these packs in the postoperative period requires a vigilant eye.

It is also imperative that anesthetists become competent with the use of the fiberoptic bronchoscope. In this particular case, without the prompt use of the bronchoscope, a delay in the differential diagnosis could have lead to a life-threatening event.

SUGGESTED READING


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