Inadvertent Carotid Transection During Pediatric Endoscopic Sinus Surgery: Important Considerations for the Anesthesiologist

Jessica Meyers Husum MD, Melissa Jarrell AA, Patrick Guffey MD
Department of Anesthesia, Children's Hospital Colorado, Aurora, CO 80045

Background
• Functional endoscopic sinus surgery (FESS) and procedures involving the parasellar and paranasal regions, such as transphenoidal tumor resection and septum surgery, are associated with the rare but important complication of carotid injury.
• Surgery involving these locations can pose technical challenges secondary to the close anatomic proximities of the cavernous sinus, sphenoid sinus, optic nerve and the internal carotid artery.
• Anatomic variants can lead to potential serious complications for otherwise well-tolerated surgeries.
• We present a case of internal carotid transection during FESS in a pediatric cystic fibrosis patient and the anesthetic considerations for FESS cases.

Case Presentation
A 6yo (18.8 kg) female with a history of cystic fibrosis with recurrent rhinosinusitis and recent pulmonary exacerbation with mycobacterium avium complex presented to the operating room (OR) for scheduled possible adenoidectomy and endoscopic sinusectomy. She presented to the OR with PICC line in place and was induced via an intravenous induction. She was orally intubatedatraumatically and maintained with a mixture of sevoflurane, oxygen, and air.

The case proceeded unremarkably for the first hour and 40 minutes, until the anesthesia provider observed a copious amount of blood from the nares and mouth of the patient. The patient became acutely tachycardic then bradycardic and hypotensive, requiring aggressive resuscitation with the institution’s massive transfusion protocol.

The otolaryngologists discovered and packed a laceration near the posterior tonsillar bed, eventually exposing and tying off the left common carotid artery from an anterior approach in the neck. The anesthesia care team obtained arterial blood pressure monitoring and central venous access. Extra manpower was obtained immediately including 3 anesthesiologists, 2 anesthetists, and 4 anesthesia technicians. In total there was 2 Liters estimated blood loss and resuscitation involved 1172mL of packed red cells, 398mL FFP, 161mL platelets, and 36mL cryoprecipitate.

The patient was then transported to interventional radiology where the left internal carotid was observed to be lacerated and was coiled in turn.

Conclusions
• As carotid artery injury is a known complication of sinus surgery and procedures involving the parasellar and paranasal regions, preoperative preparation must be made by the anesthesiologist for such cases.
• The potential high-risk elective procedures should be scheduled during the normal OR schedule to allow for the presence of extra anesthesia personnel should complications occur.
• Preoperative counseling regarding this complication and the potential need for blood transfusion should be had both with patients (if age-appropriate) and their caregivers.
• Anesthesia providers should ensure that they obtain adequate large-bore intravascular access and that the high-risk patient has an active type and screen prior to the initiation of such procedures.
• As patients with cystic fibrosis and subsequent recurrent rhinosinusitis are often scheduled for repeat and/or multiple sinus procedures, this population may pose a heightened surgical risk and the steps enumerated above should be undertaken with diligent care.

Imaging: CT Angiogram

Legend: Occlusion of the left internal carotid artery just distal to its takeoff with embolization coils seen along the expected course of the cervical left ICA

References
2) Pepper. Am J Rhinol. 2007
4) Wiedenbecher. Eur Arch Otorhinolaryngol. 2005