Accidental Middle Turbinectomy: A Complication of Nasal Intubation

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ORAL surgeons frequently request nasotracheal intubation for their surgical procedures. Nasal intubation may be complicated by epistaxis, sinusitis as obstruction to sinus drainage, transient bacteremia, or dislodgement of adenoids from mechanical trauma.1–3 We describe a case report of accidental removal of the middle turbinate during nasotracheal intubation. This case report demonstrates the importance of early detection and management of this potentially dangerous complication.

Case Report

An 18-yr-old, 45-kg autistic woman presented for surgical extraction of impacted wisdom teeth and full oral rehabilitation with general anesthesia. Her medical history was significant for akinesia resulting from Reye’s syndrome, which she developed as a child: autism and developmental delay. She was taking no medications and had no known drug allergies. Results of her airway and cardiorespiratory examinations were normal. Blood pressure was 95/68 mmHg, pulse rate was 73 beats/min, and room air oxygen saturation was 99%.

After informed consent was obtained from her mother, the patient was transferred to the operating room where standard monitors were placed. An uneventful induction and intubation were performed with nitrous oxide, oxygen, and sevoflurane. The patient was easily ventilated. Intravenous rocuronium 20 mg was administered, and the nitrous oxide was discontinued. A 6.0 cuffed nasal RAE (Malinckrodt Medical, St. Louis, MO) endotracheal tube was lubricated with 2% lidocaine jelly and inserted into the patient’s right nare with the bevel of the tube facing medially. The endotracheal tube was advanced posteriorly into the oropharynx. Minimal resistance was encountered during advancement of the tube. A copious amount of blood was observed in the oropharynx on direct laryngoscopy. Despite suctioning of the pharynx, the vocal cords were not well visualized. The nasal tube was removed, and the patient was ventilated by mask. The patient again underwent direct laryngoscopy to assess the bleeding. The oropharynx was suctioned, and a mass was seen at the base of the vocal cords and removed by Magill forceps. The mass was identified as a turbinet (fig. 1), and the otolaryngology department was consulted. The patient was successfully intubated with a 6.0 cuffed nasal RAE tube through the right nare using Magill forceps. The patient remained hemodymanically stable, and the bleeding was minimal after intubation. Because the nasal bleeding had minimized, the otolaryngologists postponed their endoscopic examination until after the oral surgical procedure. The patient underwent an uneventful full oral rehabilitation and surgical removal of wisdom teeth. After the completion of her surgery, the patient was placed on 100% oxygen, the nasal tube was gently removed, and she was reintubated orally with a 7.0 cuffed endotracheal tube. No further blood was noted during direct laryngoscopy. Otolaryngologists performed a bilateral endoscopic sinus examination. The left nare demonstrated a low hanging, medialized middle turbinate. The right nare revealed the stalk remains of the middle turbinate with all other structures intact (figs. 2 and 3). Minimal bleeding was noted, and no cerebrospinal fluid was seen. Endoscopic cautery of the right middle turbinate was performed, and no nasal packing was required. Estimated blood loss from the traumatic turbinectomy was 50 cc. The patient emerged from anesthesia uneventfully and experienced an uncomplicated postoperative course. She was placed on antibiotics for 1 week and nasal vasoconstrictor and saline sprays for 2 weeks. She was seen 2 weeks later at the otolaryngology clinic and suffered no further sequelae.

Discussion

To our knowledge, this is the first report of the inadvertent removal of the middle turbinate during nasotracheal intubation. This autistic patient had poor oral hygiene but no symptoms of chronic nasal infection or inflammation that might have predisposed her to "brittle" turbinates. After removal of the turbinate, the nasotracheal tube probably tamponaded the remnants of the bleeding middle turbinate as has been described.4 The inadvertent lack of topical vasoconstrictor to the nares may have contributed to the potential for injury as vaso-
constriction of blood vessels and shrinking of mucous membranes did not occur. In addition, it is possible that the nasotracheal tube was advanced more superiorly instead of posteriorly and perpendicular to the face, thereby pushing the endotracheal tube into the region of the middle turbinate.

The nasal turbinates contribute to the nasal function of humidification, warming, and filtration of inspired air.\textsuperscript{5} Intubation trauma to the inferior turbinate is more likely to occur than to the middle turbinate because of its anatomic location and closer proximity to the endotracheal tube during nasal intubation.\textsuperscript{6} This case demonstrates that despite normal inferior turbinate anatomy, middle turbinate trauma from nasal intubation may occur. To understand the implications of this injury, it is important to review the anatomy of the middle turbinate. The body of the middle turbinate is integrated into the ethmoid air cell system. Anteriorly, it is inserted into the skull base, conducting fibers from the olfactory nerve. Posteriorly, it is anchored loosely into the ethmoid bone. Destruction of the middle turbinate at its bony base near the cribriform carries the danger of tearing olfactory fibers and creating leakage of cerebrospinal fluid (CSF).\textsuperscript{7} This case demonstrates the importance of the use of topical vasoconstrictors and careful intubation technique. Despite careful advancement of the nasal tube during intubation, middle turbinatectomy occurred. Early detection of this complication
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is important because leakage of CSF and massive epistaxis may result from this injury. The sphenopalatine artery and posterior nasal artery lie within the pterygopalatine fossa, and the anterior ethmoid artery traverses the ethmoid air cells, all in close proximity to the middle turbinates. Trauma to the middle turbinates may produce massive epistaxis because these vessels become entrapped in tight osseous canals, which do not allow vessel retraction and hemostasis to occur.5 Immediate consultation of the otolaryngology department is necessary for endoscopic examination of the patient for hemorrhage and CSF leakage. Once the diagnosis of accidental turbinectomy has been established, we recommend proceeding with intubation through the traumatized nares to produce a tamponade effect. Endoscopic cauterity of the turbinates and nasal packing may be required to produce hemostasis. Ulceration of the inferior turbinate is a described complication of prolonged nasal intubation.6 This case has described the early diagnosis and management of inadvertent middle turbinectomy as a complication of nasal intubation. Initial oral intubation may be a reasonable alternative to nasal intubation in patients whose general hygiene and health care are less than optimal.

References


Ropivacaine-induced Convulsions and Severe Cardiac Dysrhythmia after Sciatic Block

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ROPIVACAINE, a recently introduced amide local anesthetic agent, is prepared as a pure S-enantiomer.1 So far, reported ropivacaine-associated adverse drug reactions were limited to central nervous system (CNS) and minor cardiovascular toxicity. The present case is, to our knowledge, the first report of severe cardiac dysrhythmia in clinical setting.

Case Report

A 74-yr-old, 90-kg, American Society of Anesthesiologists (ASA) physical status II man was scheduled for elective total hip arthroplasty. His medical history was remarkable for Forester’s disease with presence of a massive osteophytic protruding ventrally at C4–C5 level, which was known to prevent the introduction of a gastroscope. A fiberoptic nasopharyngolaryngoscopy was reported to be difficult; the glottis could be only partially exposed. The patient had no previous or concomitant cardiac disease. A regional anesthesia technique consisting of a combined sciatic nerve and psoas compartment block was

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