

CASE REPORT

Accidental Partial Middle Turbinectomy: A Rare Complication of Nasal Intubation

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ABSTRACT

We report a case of accidental partial avulsion of the middle turbinate during nasotracheal intubation while inducing anesthesia at the time of an elective surgery. This is a rare complication with very few cases reported until date in the literature. This case report demonstrates the importance of early detection and management of this potentially dangerous complication. Traumatic avulsion of turbinate secondary to nasal intubation may mimic presence of an abnormal nasopharyngeal mass as experienced in this case.

Keywords: Anesthesia, Epistaxis, Nasotracheal intubation, Turbinectomy.

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INTRODUCTION

The nasal intubation technique was first described by Kuhn.¹ During World War I, Rowbotham and Magill² developed the technique of "blind" nasal intubation and coined the term, which was further popularized by Magill in the 1920s. Earlier, it was popular, especially in the intensive care units for long-term ventilation, but the risk of sinusitis reduced this practice. However, with the advent of muscle relaxants, fiber optic endoscopy, and detailed knowledge of nasal anatomy, blind nasal intubations are being replaced by well-planned uneventful nasal intubation. Nasotracheal intubation is commonly preferred during oropharyngeal and maxillofacial procedures as an alternative to orotracheal intubation because

it allows for better access to the surgical field. Other indications include securing the airway in patients with cervical spine disease (using awake fiber optic intubation technique), patients with intraoral mass lesions or structural abnormalities, and patients with limited mouth opening (e.g., trismus). Absolute contraindications to nasotracheal intubation include coagulopathy, apnea or impending respiratory arrest, nasal polyps, recent nasal surgery, and history of frequent episodes of epistaxis.

There are two anatomical pathways through which endotracheal tube can be passed through nasal cavity: lower pathway along floor of nasal cavity and upper pathway below middle turbinate. Some degree of nasal trauma is inevitable even during a well-planned and prepared nasal intubation. It may be complicated by epistaxis, sinusitis secondary to sinus drainage obstruction, partial or total turbinectomy, obstruction with foreign body, and retropharyngeal trauma. Middle turbinate is attached to skull base (cribriform plate) by a thin lamella and is highly vascular. Avulsion of middle turbinate can lead to epistaxis, cerebrospinal fluid leak, or injury to olfactory nerve secondary to damage to cribriform plate.³⁻⁷ O'Connell et al⁸ reported the incidence of nasal bruising and epistaxis as 54 and 7% respectively. The other complications like partial or complete avulsion of turbinate are rare and there are very few cases being reported in literature. It is important that the diagnosis and corrective measures be prompt and adequate. This case report describes an uncommon potential complication of accidental partial turbinectomy during nasotracheal intubation, which was diagnosed and managed well.

CASE REPORT

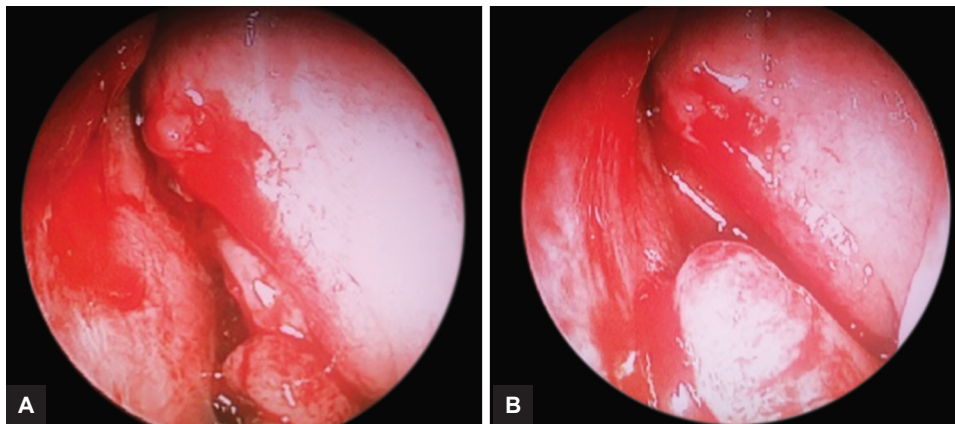
A 42-year-old male patient presented to the Department of Otolaryngology with an ulcerated lesion involving right lateral border of tongue. Patient had complaint of odynophagia, halitosis, and occasional episodes of bleeding from the lesion. There was no history of dental trauma. The patient was vegetarian by diet, a chronic smoker (30 pack-years), and occasionally alcoholic. On examination, mouth opening was normal and ulcerated growth (approximately 4 × 3 cm) was seen involving right lateral border of tongue. There was no cervical lymphadenopathy. Patient underwent complete ear, nose, and throat evaluation followed by radiological investigations

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Figs 1A and B: Endoscopic pictures showing partially avulsed middle turbinate hanging down toward nasopharynx

including ultrasound neck and magnetic resonance imaging of neck. Biopsy and histopathological examination revealed presence of squamous cell carcinoma. Partial glossectomy and supraomohyoid neck dissection under general anesthesia with nasotracheal intubation was planned.

Preanesthetic evaluations including routine blood investigations were found to be within normal limits. Deviated nasal septum and hypertrophy of the turbinates were excluded by preoperative diagnostic nasal endoscopy. Patient was placed supine on the operation table. Blood pressure was 110/78 mm Hg, pulse rate was 78 beats/min, and room air oxygen saturation was 99%. He was sedated with intravenous propofol (2.5 mg/kg). Patient was given oxygen by face mask for 3 minutes and oxygen saturation was maintained at 100% for 3 minutes. Induction of anesthesia and neuromuscular blockade was achieved using fentanyl 1.5 mg/kg, atracurium 0.5 mg/kg, and anesthesia maintained with 2% isoflurane. A 2% xylocaine jelly was introduced using nozzle in the left nostril. A 7.0 Portex cuffed tracheal tube, lubricated with 2% xylocaine jelly, was introduced into the left nostril with the bevel facing the turbinate, passing all along posteriorly toward nasopharynx. A slight resistance to the free movement of the tube into the nasal cavity was encountered by anesthetist. Brisk hemorrhage was encountered during this procedure, which was subsequently controlled by external pressure on the nostril and using topical vasoconstrictor (xylometazoline). Direct visualization using Macintosh blade revealed hemorrhage trickling down into the nasopharynx, and suspicion of mass in nasopharynx was made by the anesthetist. To arrest hemorrhage, left nostril was packed with gelfoam after removal of tube, and simultaneous suction of the blood from nasopharynx was done. Oral intubation was done, cuff inflated, and tube was secured. The anesthetist confirmed equal air entry bilaterally using a stethoscope, and capnography

showed 100% oxygen saturation. Evaluation of the nostril showed complete hemostasis and the surgery was completed with no further hemorrhage intraoperatively. Nasal endoscopy was again performed at completion of surgery and there was partial avulsion of middle turbinate, which was hanging down into nasopharynx. This answered the reason for resistance to nasal intubation and nasal bleed while intubation (Fig. 1). The middle turbinate was removed later using a forceps and merocele was placed on that side. The patient recovered from general anesthesia uneventfully. Pack was removed after 2 days and there was no bleeding. Patient was kept on antibiotics and nasal drops (both topical vasoconstrictor and saline drops). Patient was discharged uneventfully and is on regular follow-up.

DISCUSSION

Nasotracheal intubation is one of the preferred methods used to secure airway in surgery of maxillofacial or oropharyngeal region, as it gives good accessibility and visibility of the surgical site. Several complications may be encountered while inducing anesthesia ranging from minor ones like mucosal trauma to major ones including epistaxis, partial or total turbinectomy, and retropharyngeal trauma. Deviated nasal septum is the commonest intranasal abnormality, which is considered a risk factor for trauma during intubation.³⁻⁷ Anesthetists with experience learn to apply the accurate threshold pressure required to advance the tube into the trachea. However, if more than the threshold pressure is required for intubation, then the other nostril is used for intubation. This article reports of a partial avulsion of middle turbinate, which occurred at the time of nasotracheal intubation and discovered after nasal endoscopy and was well managed. To understand the implications of this injury, it is important to know the detailed anatomy of the middle turbinate. Middle turbinate is attached to the skull base (cribriform plate) by a thin lamella and is highly vascular. Avulsion of

middle turbinate can lead to epistaxis, cerebrospinal fluid leak, or injury to olfactory nerve secondary to damage to cribriform plate. Early detection of this complication is important because leakage of cerebrospinal fluid and massive epistaxis from anterior ethmoid or sphenopalatine artery may result from this injury.⁹ Endoscopic cautery of the turbinates and nasal packing may be required to produce hemostasis as done in this case.

The exact cause for the avulsion is not known, but above threshold pressure application while introducing the nasotracheal tube is suspected. 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. Such complications can be avoided by¹⁰

- Identification of correct nostril for intubation and excluding the presence of nasal spurs in the nostril selected for intubation by fiber optic or rigid nasal endoscopy.
- Application of below threshold pressure at the time of intubation.
- Lubrication of the nostril and tube prior to intubation.

CONCLUSION

Nasotracheal intubation is the preferred alternative to orotracheal intubation during oropharyngeal and maxillofacial procedures because it allows for better access to the surgical field. However, complications during the process of nasotracheal intubation are not rare and range from minor mucosal tear to major epistaxis. Partial or complete avulsion of the turbinate (middle or inferior) during nasotracheal intubation is rare and very few cases have been reported

in literature. This case report demonstrates the importance of early detection and management of this potentially dangerous complication. However, these complications can be minimized with judicious use of available preanesthetic evaluation methodologies and fiber optic endoscopic techniques to achieve predictable and safe results.

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