Optimizing Anesthetic Management of Empty Nose Syndrome at an Ambulatory Surgery Center

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Abstract

Aims: This report explores a case of Empty Nose Syndrome (ENS) following turbinate reduction surgery, focusing on management strategies in an outpatient setting.

Methods: We present a case of a young male with ENS and obstructive sleep apnea who underwent surgery using acellular dermal sheets to reconstruct pseudo-inferior turbinates. A multidisciplinary approach involving ENT, anesthesia, and nursing teams was utilized.

Results: The surgery was successfully performed on an outpatient basis, demonstrating the feasibility of managing ENS with careful planning.

Conclusion: This case highlights the importance of multidisciplinary collaboration and the need for further research to optimize ENS treatment strategies.

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Introduction

Empty Nose Syndrome (ENS) is a rare but debilitating condition that occurs following surgical procedures such as turbinate reduction or nasal surgeries. Despite the nasal passages appearing anatomically patent, patients experience paradoxical nasal obstruction and chronic nasal dryness, resulting in significant psychological distress. The pathophysiology of ENS remains poorly understood, making its diagnosis and management challenging [1–3]. This can lead to misdiagnosis, often those that are psychosomatic.

Dr. Steven Houser defines ENS as "paradoxical nasal obstruction despite an objectively wide, patent nasal fossa." Patients commonly report a "stuffy" or "empty" feeling, due to impaired airflow sensation, often following total or partial turbinectomy. ENS cases consistently involve some form of turbinate surgery [4].

ENS patients may experience nasal crusting, thick mucus, and occasional pain. Some report improved breathing during upper respiratory infections, adding to the complexity of the condition [3].

ENS is often mistakenly identified as synonymous with atrophic rhinitis in the literature. While they share symptoms such as congestion, dryness, and crusting, they are distinct conditions with different origins. Atrophic rhinitis, which can be primary or secondary with various underlying causes, involves the loss of turbinate and mucosal tissue. In contrast, ENS is an iatrogenic condition resulting from medical intervention. This distinction is crucial because secondary atrophic rhinitis can follow turbinate surgery or arise from trauma, infection, or immune issues, and it has known pathogens, unlike ENS, which does not have a specific associated pathogen [5].

It is still unclear as to why some patients will develop ENS and others will not. One theory is a "two hit" process that can occur. First, tissue is excised or damaged, and second, the sensory nerves to the affected area regenerate poorly. The meatuses that are formed between the turbinates provide resistance to airflow and create a laminar flow pattern. Airflow is disrupted after procedures such as a turbinectomy which destroys the relationship between the turbinates and meatal structures. The most common combination symptoms used to diagnose ENS are paradoxical airway obstruction, dyspnea, nasal and pharyngeal dryness, hyposmia, and depression [3].

The development of ENS is unpredictable; patients with complete turbinate removal may never develop the syndrome, while others with only partial resection experience significant symptoms. Symptom severity and impact on quality of life vary, with some patients experiencing a constant sense of suffocation. Depression and reduced smell acuity are also common. ENS can manifest months or even years after surgery, often due to continued tissue atrophy. The loss of nasal mucosa appears to be a key factor, leading to altered airflow and deficient sensation [2].

Traditional diagnostic tests, like rhinomanometry and acoustic rhinometry, often fail to align with the patient's subjective experience of obstruction. These tests measure airflow resistance and nasal cavity dimensions but do not fully capture the neurosensory aspects that influence nasal patency perception. Studies show that trigeminal afferents play a significant role in this perception; for instance, local anesthetics can induce a sensation of obstruction, while menthol can create a feeling of decongestion without actual changes in nasal structure [3].

Anesthesia can be challenging in patients who present for ENS repair, especially in a fast-paced outpatient surgery center. Foremost, it is imperative that anesthesiologists recognize the profound emotional and physical toll that many ENS patients endure. When these patients present for surgery, they are often frustrated and anxious as they may have already undergone multiple procedures without relief. Their fear is rooted in the debilitating symptoms of ENS, and it is vital for anesthesiologists to approach them with empathy, understanding the complexities of their condition and the profound impact it has on their quality of life. Patients are often plagued with psychological symptoms including anxiety, depression, and in extreme cases suicidal ideations. Patients are often on a myriad of medications

pre-operatively which can make the administration of anesthesia challenging in an outpatient surgical center.

As ENS is a rare condition, there are no clear anesthetic guidelines for managing ENS patients undergoing surgery. Given the complexity of ENS our case presentation underscores the importance of a multidisciplinary approach in managing this condition.

Methods

The patient was a male in his early 20s, with a BMI within the normal range. The patient had a past medical history of obstructive sleep apnea, and a condition related to nasal function. His surgical history included multiple prior nasal surgeries, including turbinate reductions performed in a different country. The patient traveled a significant distance to present to the ambulatory surgery center for a procedure involving the placement of acellular dermal sheets to create pseudo-inferior turbinates, aiming to alleviate his symptoms and improve nasal function.

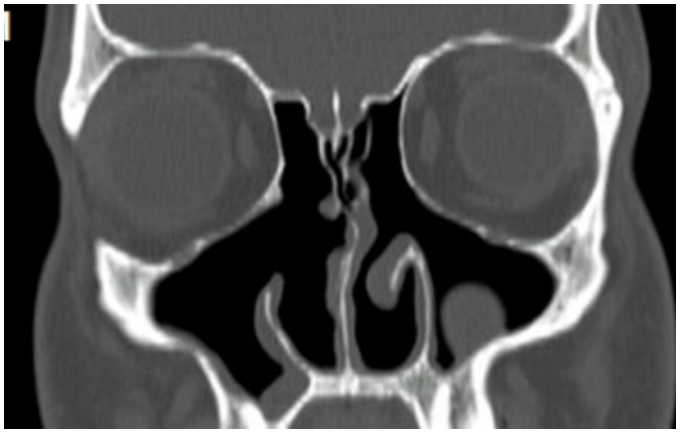
Results

Preoperative

His ENT consultation was notable for dry nasal mucosa with small inferior turbinates. An endoscopic evaluation showed a reasonably straight septum, dry mucosa, no polyps, and open maxillary sinuses with significant turbinate loss. The cotton test, simulating a submucosal implant, provided approximately 70% improvement in breathing. The patient's outside hospital computed tomography (CT) sinus data was reviewed (Figures 1, 2).

Figure 1 Coronal CT scan image of the nasal anatomy. Coronal CT view showing a noticeable absence or reduction in the turbinate structures.

Figure 2 Coronal CT scan image of the nose and turbinates



In preoperative holding, his vital signs were stable though he appeared anxious. He was verbally reassured and given time with his family and support persons prior to premedication with midazolam and was then brought to the operating room.

Intraoperative

The patient was preoxygenated with the anesthesia mask and 10 liters of oxygen near, not on, his face due to being intolerable to the feeling of the oxygen flow. General anesthesia induction included fentanyl, propofol, lidocaine, and rocuronium and an endotracheal tube was placed with a Mac 3 blade. General anesthesia was maintained with a remifentanil infusion and sevoflurane. Dexamethasone and cefazolin were also given, along with a dose of ondansetron before awakening. At the conclusion of the surgery, the patient had a smooth emergence and was taken to the recovery room.

A coronal section which shows the inferior turbinates that are significantly reduced, creating a more open nasal passageway.

Postoperative

Postoperatively the patient's vital signs were stable, including pain rated at 3/10 and no nausea nor vomiting. Due to unanticipated concerns from the support persons, the PACU course was prolonged to nearly three hours.

Discussion

ENS presents a significant challenge for both patients and healthcare providers due to its complex symptomatology, considerable psychological challenges, and impact on quality of life [1, 2]. This condition can be particularly demanding for anesthesiologists. To address the complexities of ENS, it is crucial to adopt a multidisciplinary approach. This involves coordination between anesthesiology, ENT surgery, and nursing teams to ensure comprehensive management and improve postoperative outcomes [1].

During surgery, anesthesiologists should be ready for possible challenges in managing the airway due to nasal obstruction or altered anatomy. Using flexible fiberoptic bronchoscopy or video laryngoscopy can be particularly helpful in these situations. Ensuring proper hydration and humidification of the inhaled gases is helpful to prevent further nasal dryness and crusting, which are common in patients with ENS. The selection of anesthetic agents should focus on creating a motionless surgical field for operation while also planning for postoperative pain relief and minimizing respiratory depression [6]. Local anesthetic and intravenous opioid medication were given intraoperatively by the surgeon and anesthesiology, respectively.

After surgery, anesthesia— focus should be on effective pain management, nasal hygiene, and emotional support. Using a mix of pain relief methods, including local anesthetics and non-opioid medications, helps manage pain while keeping respiratory function intact. Regular nasal saline rinses and humidification are essential for maintaining moist mucosa and preventing dryness, which is crucial for patient comfort and optimal surgical outcomes. It is vital to work closely with nursing staff for ongoing monitoring and support [7].

Preoperative planning should include contributions from all relevant specialties to create a personalized care plan for the patient including considerations for lodging, meals, post-surgical care, follow up appointments, and other social and mental health support. Ongoing communication and teamwork among all involved can help tackle any challenges that come up during the perioperative period and enhance overall patient outcomes [2,7].

This case adds to the literature by demonstrating that a patient with ENS can be managed in an outpatient setting without complications, provided that a thorough evaluation is conducted, and the team adapts to the patient's needs.

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