

# Persistent Postsurgical Idiopathic Rhinitis After Sedation Utilizing Supplemental Oxygen Via Nasal Cannula

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## Abstract

This case describes an uncommon complication of postprocedural unilateral nonallergic rhinitis in a patient who received moderate intravenous sedation (IV) for an elective oral/periodontal surgical procedure. Some authors suggest this potential problem is underreported, and may not be as rare as the literature implies. The patient, a 48-year old female, received supplemental oxygen and ventilation monitoring via a CO<sub>2</sub>/O<sub>2</sub> nasal cannula during the sedation/surgery. The procedure was completed uneventfully, but postoperatively (PO) she developed persistent rhinitis, sternutation, and rhinorrhea that peaked at day 4 PO, and then slowly started to resolve until symptoms completely gone at day 13 PO. Although the patient was in no distress, the symptoms being continual for longer than a week did interfere with her daily activities. While the rarity of this atypical reaction may be in question, practitioners who utilize sedation should be aware of this possible distressful condition and counsel patients on the risk.

**Keywords:** Sedation, Postprocedural Rhinitis, Nasal Cannula, Supplemental Oxygen

**Abbreviations:** PO: Postoperatively, ASA: American Society of Anesthesiologists, AAOMS: American Association of Oral and Maxillofacial Surgeons, ADA: American Dental Association, ASDA: American Society of Dental Anesthesiologists, IV: Intravenous, OTC: Over-The-Counter

## Introduction

Rhinitis is a widespread disorder that can significantly affect a patient's perceived everyday quality of life. In general, rhinitis is etiologically categorized as either allergic or nonallergic rhinitis (vasomotor, idiopathic) [1]. It is associated with either rhinorrhea, sneezing, itching, congestion, or all of the symptoms together [1]. Rhinitis, whether work-related or not, has been shown to have a considerable adverse impact on the physical and mental

health of patients [2]. It is usually brief and self-limiting, but could become prolonged in some patients. Symptoms that linger may become worrisome to the patient and contribute to postsurgical morbidity.

Moderate sedation (previously referred to as conscious sedation) is routinely administered by periodontists trained in this modality. The use of supplemental oxygen, usually by nasal cannula when operating intraorally, is the standard of care recommended by multiple professional organizations to



include the American Society of Anesthesiologists (ASA), the American Association of Oral and Maxillofacial Surgeons (AAOMS), The American Dental Association (ADA), and the American Society of Dental Anesthesiologists (ASDA) [3]. Postoperative rhinitis after sedation with supplemental oxygen administration through a nasal cannula has been reported by authors who also contend that this complication is highly underestimated, though not trivialized. [4-7].

We present a case of postoperative rhinitis following IV sedation employing supplemental nasal oxygen. A review of the scientific literature on this specific post-sedation complication reveals very few reports, although Li et al's 2011 study showed an incidence as high as 7.1% when normal length nasal cannula prongs were used [6]. A unique aspect with this patient's symptoms is that they persisted for almost 2 weeks. All other reports we could document revealed diminished symptoms by day 5 PO, however there are online blogsite posts of patients whose symptoms lasted "for days to months" [4]. Future investigations could shed light upon the true incidence of this uncommonly reported complication.

## Case Presentation

A 48-year old African American female was referred to the Dental College of Georgia at Augusta University, Augusta, Georgia, from a private practitioner with a chief complaint of "wanting to get a gingival graft for my recession." The medical history review was remarkable for hypertension and hypothyroidism. Current daily medications included amlodipine, levothyroxine, and occasionally aspirin as needed. The patient had confirmed allergic reactions in the past to latex and oxycodone. Her social history included occasional wine consumption, and she denied any tobacco or recreational drug use.

Under intravenous (IV) sedation (fentanyl, midazolam, diphenhydramine) and local anesthesia (2% lidocaine with 1:100,000 epinephrine, 0.5% bupivacaine with 1:200,000 epinephrine), the surgical procedure was performed without incident. Supplemental oxygen was given at a flow rate of 4 liters/minute via a soft plastic nasal cannula with average prong length (10 mm), which also monitored end tidal CO<sub>2</sub>. Upon recovery the patient experienced rhinitis with sneezing,

and significant rhinorrhea that persisted. Follow-up by phone later that day revealed the patient also had developed some congestion and a slight "burning sensation in her nose." She was prescribed an over-the-counter (OTC) topical intranasal antihistamine (azelastine) and corticosteroid (fluticasone), and a topical anticholinergic (ipratropium bromide) which she did not obtain/utilize. For the "burning sensation" the patient applied cocoa butter and/or aloe gel for relief. Her symptoms gradually daily improved for over a week, with complete resolution by the end of the second week at her postoperative appointment.

## Discussion

There are very few reports in the literature on post-sedation rhinitis utilizing supplemental oxygen thru a nasal cannula, and none in the dental/dental anesthesia literature. Nonallergic idiopathic rhinitis (vasomotor) signs/symptoms can clinically resemble those of allergic rhinitis, and therefore be difficult to distinguish between allergen-induced reactions. It is usually diagnosed by excluding other possibilities with such a sudden onset as this one. The etiology behind vasomotor rhinitis is still not completely understood due to the huge variability of symptoms that can be presented [8]. Evidence suggests that a localized nasal mucosal allergic response may be the precipitating factor in some nonallergic rhinitis patients [9]. Li et al's study proposed that mechanical irritation of the nasal mucosa by average length oxygen cannula prongs could trigger the pathological reaction [6]. Mucosal injury from prong tips could stimulate the nasal mechanoreceptors promoting cholinergic efferent responses, which then may lead to rhinitis/rhinorrhea [7]. This was shown in their 2011 study by comparing normal length 10 mm nasal prongs to reduced length 2 mm prongs and to nasal masks in 836 patients. None of the nasal mask patients experienced rhinitis, only one of the trimmed (reduced length) patients had rhinitis, but twenty-one of the patients (7.1%) using normal length prong cannulas suffered from rhinitis. The disadvantage was that both the trimmed prong and mask groups had increased incidence of transient hypoxia [6].

The adverse incident described here was persistent and significant to the patient's perceived well-being. Prescribed



treatment was aimed at alleviating the patient's major symptoms. Topical nasal steroids combined with topical nasal antihistamines has demonstrated efficacy in most patients [8]. Fluticasone, beclomethasone, and budesonide have all shown significant effectiveness for vasomotor rhinitis [10,11]. Azelastine, a topical antihistamine, is approved for both allergic and nonallergic rhinitis, as well as partial effectiveness for rhinorrhea and congestion [12]. Luo et al showed that azelastine augmented the positive clinical results of topical steroids when used concomitantly [13]. A topical anticholinergic medication, ipratropium bromide, has been shown to be very effective for rhinorrhea [14].

Except for the one clinical trial by Li et al, the evidence for post-sedation rhinitis from possible mechanical mucosal injury via supplemental oxygen thru nasal prongs involves only a few published observed clinical reports. Some of these authors also believe that this postprocedural complication is vastly underreported, and that practitioners should take notice and counsel patients during the pre-operative/sedation interview. Further studies on the true incidence of this potential adverse event should be encouraged. The association of this potential complication during sedation is strong enough such that clinicians should take notice.

## Conclusion

Although post-sedation rhinitis/rhinorrhea precipitated by mucosal injury thru supplemental oxygen delivery via nasal cannula has not been absolutely confirmed with controlled trials, the reported incidence is sufficient enough to raise questions by concerned practitioners. Fortunately, most cases appear to be transient, and usually respond to topical drug therapy. Predisposed patients should be educated on this potential sedation complication.

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The authors report no conflict of interest.

## Consent

Informed verbal consent was provided by the patient for publishing this article in a scientific/medical/dental journal.

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