

Surgical Management of Nonallergic Rhinitis

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KEYWORDS

- Nonallergic rhinitis • Vasomotor rhinitis • Nasal congestion • Rhinorrhea
- Vidian neurectomy • Posterior nasal neurectomy • Cryotherapy

KEY POINTS

- Vasomotor rhinitis is the most frequent subtype of nonallergic rhinitis (NAR) and is characterized by non-immunoglobulin E-mediated symptoms of nasal congestion, obstruction, and rhinorrhea.
- NAR is triggered by changes in environmental conditions, weather, strong emotions, smells, and hormones.
- Although medical management is the first-line treatment of NAR, there is a role for surgical therapy when medications fail to improve symptoms.
- Vasomotor rhinitis is due, in part, to an imbalance between parasympathetic and sympathetic inputs to the autonomic nervous system.
- Surgical targeting of the vidian nerve and its branches can result in symptomatic improvement. Options include vidian neurectomy, posterior nasal neurectomy, and cryotherapy.

INTRODUCTION

Nonallergic rhinitis (NAR) describes chronic symptoms of nasal congestion, obstruction, and rhinorrhea unrelated to a specific allergen based on skin or serum testing. NAR affects approximately 30 million Americans, and more than 200 million worldwide.¹ Although NAR can present with symptoms similar to those found in allergic rhinitis (AR), NAR tends to have an older age of onset, typically presenting between 30 and 60 years of life.² Patients with NAR are more commonly women, have decreased eosinophil response, and suffer from more frequent headaches and olfactory dysfunction, but less sneezing and pruritus.³ The predominant symptom of NAR, nasal congestion, can have a significant impact on quality of life, contributing to sleep disturbances, daytime somnolence, and decreased productivity at work. Additionally, patients may have a combination of AR and NAR, known as mixed rhinitis (MR). The

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use of an irritant index questionnaire has helped to reclassify patients with NAR, AR, or MR based on their symptoms in response to nonallergic triggers and aeroallergen skin prick tests, as well as to stratify them according to low or high irritant burdens.⁴ Patients with NAR are often misdiagnosed as having sinusitis and are treated with multiple courses of antibiotics without resolution of symptoms.

In recent years, NAR has been divided into several different subtypes, including rhinitis that is drug-induced, gustatory, hormonal, or senile; vasomotor rhinitis (VMR); NAR with eosinophilia; and atrophic rhinitis.⁵ VMR is the most frequent form of NAR and is characterized by nasal symptoms usually triggered by changes in environmental conditions, weather, strong emotions, smells, and hormones. Brandt and Bernstein⁶ developed a validated questionnaire that helps diagnose VMR. Unlike AR, VMR is a clinical diagnosis based on a patient's symptoms and triggers.

To best appreciate the treatment options for NAR, we need to first evaluate the pathophysiology of NAR. Although the etiology is not well understood, there is thought to be a dysregulation of sympathetic, parasympathetic, and nociceptive nerves innervating the nasal mucosa resulting in increased vascular permeability and mucus release from submucosal nasal glands.^{7,8} Mucus secretion is controlled primarily by the parasympathetic nervous system, whereas the sympathetic system controls the vascular tone.⁹ Acetylcholine is the main parasympathetic neurotransmitter that regulates nasal mucus secretion and rhinorrhea, a common symptom of rhinitis. Noradrenaline and neuropeptide Y are sympathetic neurotransmitters that modulate the secretions initiated by the parasympathetic system.¹⁰ In addition, sensory neuro-peptides and nociceptive type C-fibers of the trigeminal nerve contribute to mast cell degranulation and the itching and sneezing reflexes.

The first-line treatment for VMR is medical therapy in the form of topical corticosteroid and topical antihistamine sprays (which are indicated for NAR as well as AR). Ipratropium bromide (0.03%) is the only topical anticholinergic approved for treatment of NAR with no systemic side effects except for occasional dryness and epistaxis.¹¹ Topical capsaicin has been shown to be an efficacious treatment for NAR based on its modulating effects on C-fibers, but because of its irritant qualities, its use is often limited by patient intolerance.¹² There are no oral antihistamines or anticholinergics currently approved for NAR. When medical management does not adequately control a patient's symptoms, surgical interventions may be considered (Fig. 1).

INFERIOR TURBINATE REDUCTION

Inferior turbinate hypertrophy contributes to chronic rhinitis symptomatology by hypersecretion and nasal obstruction. Patients with NAR have been shown to benefit from surgical corrections of nasal obstruction with improvements in the patient-reported sino-nasal outcome test (SNOT-22), global nasal function tests, and objective nasal peak inspiratory flow.¹³

Many different surgical techniques have been developed for inferior turbinate reduction (ITR). The total inferior turbinectomy, historically performed to improve nasal obstruction, has long fallen out of favor, as it can lead to potential complications, including atrophic rhinitis and paradoxical nasal obstruction, characteristic of empty nose syndrome.¹⁴ Mucosal-sparing and turbinate-sparing techniques are now favored to preserve physiologic function of the turbinate; they include submucosal microdebrider reduction of soft tissue, submucosal resection of bone, electrocautery, radiofrequency ablation, coblation, laser ablation, cryotherapy, direct microdebridement, and

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