



Diagnostic Criteria for a Curable Form of Chronic Rhinosinusitis: The Mucous Recirculation Syndrome

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ABSTRACT

In clinical practice, nonallergic rhinosinusitis (rhinopathy) is a common diagnosis of exclusion. The mucous recirculation syndrome is one incompletely defined condition that masquerades as nonallergic rhinopathy. Mucous recirculation syndrome, a curable condition, should be differentiated from nonallergic rhinopathy. The underdiagnosis of this condition is due in part to a lack of diagnostic criteria. In this article, we review the medical literature to better characterize mucous recirculation syndrome and to establish diagnostic criteria for it.

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Nonallergic rhinosinusitis (rhinopathy) is a default diagnosis for chronic rhinosinusitis with no detectable cause. This heterogeneous syndrome previously has been called vasomotor rhinitis, nonallergic rhinitis, and idiopathic rhinitis.¹⁻³ Our group has worked to define conditions responsible for incompletely defined syndromes of rhinopathy and to establish diagnostic criteria for them.⁴⁻⁶

In this investigation, we studied a form of chronic rhinosinusitis underappreciated in the clinical literature. The mucous recirculation syndrome, first noted as a phenomenon in 1978 by Messerklinger and reported in 1996 and 1997 to cause chronic sinusitis, can be a confounder if not excluded in clinical studies of chronic rhinosinusitis.⁷⁻¹⁰ Unlike many other forms of chronic rhinosinusitis, it is curable. In this study, we sought to better characterize and develop diagnostic criteria for the mucous recirculation syndrome.

METHODS

We searched the medical literature to construct a study cohort with adequate clinical data to complement that of 4

unreported patients with mucous recirculation syndrome from our university referral practice. Using the PubMed and Scopus search engines, we performed separate computer-based searches on “mucous OR mucous AND recirculation” and “mucoïd AND rhinitis” We used MeSH terms limited to the English language only. Inclusion criteria for patients in this cohort were: a diagnosis of Mucous Recirculation Syndrome in a peer-reviewed journal; data on age and sex; documentation of one or more symptoms of chronic rhinosinusitis to include paroxysmal sneezing, rhinorrhea, nasal congestion, or postnasal drainage; and mucous recirculation visualized on nasal endoscopy (**Figure 1**).

RESULTS

Study Cohort

Computer-assisted searches produced 21 articles from PubMed and 37 from Scopus that identified 30 distinct publications (**Figure 1**). These 30 publications were reviewed, and reports in 6 articles were identified that provided information on patients who met inclusion criteria. In the process of reviewing these 6 articles, we found 2 additional reports with 2 more patients who were included in our analysis. With the addition of our 4 patients, 12 patients with mucous recirculation formed the study group (**Table 1**).

Of the 12 patients in our cohort, 7 were female, 3 were male, and the sex was not reported in 2 patients (**Table 1**).

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The patients ranged from 28 to 80 years old, with an average age of 53 years. Our 4 patients were of Caucasian descent, but the races of the study subjects were not provided in any of the case reports. The most common presenting symptoms were persistent postnasal drainage and nasal obstruction. Five of 12 patients had received antibiotics without resolution of symptoms.

Eleven of the 12 patients had previous sinus surgeries for “maxillary sinusitis,” identified as 7 on the right, 3 on the left. One patient had surgery on the sphenoid sinus. Six of 12 patients had a “misplaced middle meatal antrostomy” such that recirculation occurred between the natural ostium of the maxillary sinus and the middle meatal antrostomy. Recirculation between the natural ostium or antrostomy and an accessory (nonsurgical) ostium was the second most common mechanism and occurred in 3 of 12 patients (25%). For the remaining 25% of patients, recirculation occurred between a middle meatal antrostomy and an inferior meatal antrostomy, between the natural ostium of the maxillary sinus and an iatrogenic maxillary ostium, or between the natural ostium of sphenoid sinus and a sphenoidotomy.

Patients not Included

We believed that exclusion of patients in reports where they did not meet inclusion criteria was important as we sought to identify only those patients who were symptomatic from mucous recirculation. This is important, as mucous recirculation could theoretically occur without symptoms. Therefore, we included only 2 of 44 patients from 3 large studies of mucous recirculation syndrome. However, the data from these 3 studies were carefully reviewed.

One of these studies reported 7 patients, of whom 5 were male and 2 were female (Table 2).¹¹ They ranged from 14 to 55 years of age, with an average age of 35 years. Mucous recirculation occurred between the natural ostium and an accessory ostium in all 7 patients. In the second study, all 31

patients had previous sinus surgeries.¹⁰ Seventeen patients had recirculation between a middle meatal antrostomy and the natural maxillary ostium. Of the remaining 14 patients, 12 had recirculation between a middle and inferior meatal antrostomy. Six patients in a third study all had previous sinus surgeries as well.¹² All 6 patients had recirculation between middle and inferior meatal antrostomies.

CLINICAL SIGNIFICANCE

- Without established diagnostic criteria and an unknown prevalence, the mucous recirculation syndrome is an under-diagnosed condition.
- The possibility of the mucous recirculation syndrome should be considered in patients with chronic rhinosinusitis.
- Unlike many forms of rhinitis, the mucous recirculation syndrome is curable.

DISCUSSION

From Phenomenon to Clinical Syndrome

For many years, inferior surgical antrostomy to produce nasoantral windows was performed with the intention to “drain” chronically infected sinuses by gravity through the nose. It was not until the studies of Messerklinger demonstrated that secretions in the sinuses were directed by cilia around these surgically placed ostia to the natural ostium that the ineffectiveness of inferior antrostomies became apparent.⁷

The clinical significance of the mucous recirculation was not identified until mucous recirculation was noted to cause symptoms of chronic rhinosinusitis and that recirculation between 2 prior surgical antrostomies could be the mechanism for it.^{9,12} Since then, aberrant mucous recirculation has been noted between surgically or spontaneously occurring accessory sinus ostia.¹³⁻¹⁶

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Mechanism

Mucous recirculation occurs when mucous propelled by respiratory epithelium deviates from normal mucous circulatory pathways. Under normal conditions, mucoid secretions from the frontal sinus, maxillary sinus, and the anterior ethmoidal complex are transported out of the sinuses to join in or near the ethmoidal infundibulum and travel to the nasopharynx to be swallowed (Figure 2).¹⁷ Secretions from the posterior ethmoid and sphenoid sinus also are transported out of their respective ostia by ciliary

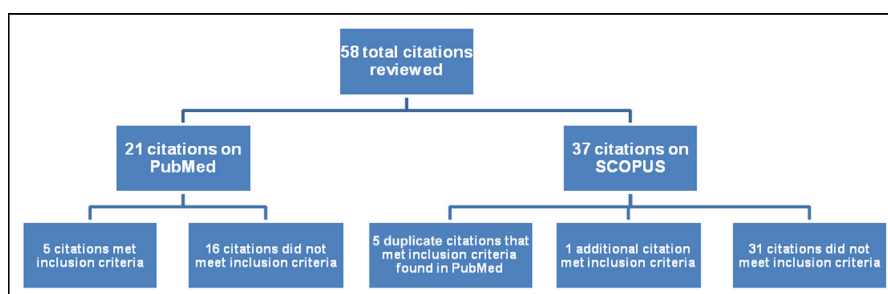


Figure 1 Flowchart used to select patients for inclusion in this study.

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