

When should consideration be given to referring a patient with chronic rhinosinusitis to an ear, nose, and throat specialist?

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Internists are seldom jealous of surgeons; nay, they may back up and recommend each other.

—Plutarch (46-120)

Rhinosinusitis is the most frequently reported chronic disease in the National Health Interview Survey. Restricted activity days and office visits are in the millions. The direct medical costs exceed \$2 billion per year, and this is a conservative figure because it does not include outpatient surgery and diagnostic imaging. Patients with chronic rhinosinusitis have significantly lower scores for bodily pain and social functioning than other chronic diseases such as chronic obstructive lung disease, congestive heart failure, and back pain. Establishing an accurate diagnosis of rhinosinusitis is one of the most important services allergists can perform for their patients.

The allergist is certain to encounter instances of nasal polyps and resistant or acute recurrent rhinosinusitis that do not respond to usual medical therapy, including appropriate antibiotics, intranasal corticosteroids, systemic corticosteroids, decongestants, and mucous thinners. It is then incumbent on the allergist to consider medical conditions that may underlie nasal polyps and resistant or recurrent rhinosinusitis. These conditions include allergy, immune deficiency, ciliary dysfunction, cystic fibrosis, gastroesophageal and nasopharyngeal reflux, aspirin-exacerbated respiratory disease, chronic rhinosinusitis (CRS), and allergic fungal rhinosinusitis.¹ Particular mention should be made of allergic fungal rhinosinusitis, in which early surgical intervention is warranted to confirm the diagnosis and remove all of the thick eosinophilic mucin from the sinuses.

Briefly, these underlying conditions can be diagnosed and treated in the following manner. Allergic rhinitis is diagnosed by history, physical examination, and skin or *in vitro* tests. Treatment includes environmental control, pharmacotherapy, and possibly immunotherapy.

Abbreviations used

AERD: Aspirin-exacerbated respiratory disease

CRS: Chronic rhinosinusitis

CT: Computed tomography

FESS: Functional endoscopic sinus surgery

Immune deficiency is diagnosed by history, physical examination, measurement of circulating immunoglobulins, and preimmunization and postimmunization antibody titers to antigens such as pneumococcus. Treatment is a full antibiotic course possibly followed by prophylactic antibiotics. Consideration should be given to supplementary intravenous or subcutaneous immunoglobulin.

The incidence of rhinosinusitis and nasal polyps is quite high in cystic fibrosis. Diagnosis is made by history, physical examination, sweat chloride determination, and genetic blood testing. Medical therapy includes intranasal cortisone and appropriate antibiotics. Many of these patients do eventually require surgery.

Gastroesophageal reflux disease is suggested by history, esophageal pH probe study, and/or endoscopy. Treatment includes lifestyle changes, H₂ blockers, proton pump inhibitors, and in resistant cases, fundoplication.

Aspirin-exacerbated respiratory disease (AERD) consists of the familiar triad of nasal polyps, generally associated with chronic rhinosinusitis, asthma, and aspirin sensitivity. Desensitization with aspirin followed by daily administration of aspirin has been shown to result in a significant decrease in sinus infections, decrease for the need for sinus and polyp surgery, decrease in the use of both nasal and systemic steroids, and decrease in hospitalization for asthma.²

Chronic rhinosinusitis with and without nasal polyps can be divided into 2 groups: infectious and inflammatory. The infectious type is diagnosed by positive culture from the middle meatus for anaerobes such as Gram-positive *Streptococcus*, *Bacteroides*, and *Fusobacterium*; aerobic bacteria such as *Staphylococcus aureus*; and Gram-negative rods such as *Pseudomonas aeruginosa*. There is a prominent appearance of neutrophils in the mucous and sinus tissue. Treatment consists of prolonged antibiotic treatment against aerobic and anaerobic bacteria.

The inflammatory type of CRS is sometimes referred to as *chronic hypertrophic eosinophilic rhinosinusitis*. Diagnosis is established by history, physical examination, and nasal cytology. Culture is generally negative, and here the predominant inflammatory cell is the eosinophil. The etiology of chronic hypertrophic eosinophilic rhinosinusitis is unknown, and it generally does not respond to surgery or repeated courses of antibiotics. It has been suggested that staph enterotoxins, the so-called

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superantigens, may play an etiologic role in some patients. Another possibility is a T_H2 chronic inflammation driven by airborne fungi such as *Alternaria*. Therapeutic approaches include topical and systemic corticosteroids, topical and systemic antifungals, and leukotriene antagonists.³

Allergic fungal sinusitis is diagnosed by history, physical examination, microscopic examination of nasal mucous looking for the characteristic allergic mucin, and computerized tomography (CT) of the sinuses. Treatment after the surgery discussed consists of a protracted course of prednisone.

Once these conditions have been ruled out and/or appropriately treated without improvement, consideration should be given to referral to an otolaryngologist. It is important for the referring physician to have a certain comfort level with the referral. One should look for the degree of experience of the surgeon, a history of good results with previous patients, and a conservative attitude. Is it possible for the patient to walk out of an ENT office without an operation? The burden of disease must be considered in terms of quality of life including nasal obstruction and frequency of use of antibiotics and systemic corticosteroids. The use of antibiotics 3 times a year or more for treatment of rhinosinusitis should prompt investigation of the conditions discussed and consideration of referral.

NASAL POLYPS

In most instances, it is appropriate to treat nasal polyps with a course of oral prednisone for 6 to 10 days followed by regular use of an intranasal corticosteroid. This may be repeated 2 to 3 times a year. A CT of the sinuses should be obtained at the end of the initial treatment. The biggest fear would be missing a serious condition such as a malignancy, an inverted papilloma, or an encephalocele. These conditions generally do not respond to systemic and/or nasal corticosteroids, although one might see a modest improvement initially. Physicians should be particularly suspicious of unilateral nasal polyposis. This would be highly suggestive of one of the more serious conditions.

RECURRENT ACUTE OR CHRONIC RHINOSINUSITIS

A number of anatomical abnormalities may result in recurrent or resistant rhinosinusitis (Table I). All would have the effect of occluding the sinus ostia. This prevents mucous drainage and leads to a decrease in O_2 tension. The result is an increase in sinus acidity, impaired function of cilia, damage to the sinus mucosa, and abnormality in bactericidal function of the granulocytes. Ostial obstruction leads to negative pressure in the sinuses and, together with mucous dysfunction, the nasal flora flows against mucociliary beat patterns and enters the sinuses. The result is bacterial infection in the paranasal sinuses.

The surgical procedure of choice in resistant rhinosinusitis is functional endoscopic sinus surgery (FESS). More than 200,000 of these procedures are performed every year in this country. The operation is designed to open key anatomical areas to restore sinus ventilation and drainage. An important feature of FESS is preservation of the sinus mucosa, which has the potential to revert to normal and regenerate. Computer-assisted image-guided FESS

TABLE I. Anatomical conditions predisposing to CRS

Septal deviation
Concha bullosa
Inferior turbinate hypertrophy
Obstruction of the middle meatus
Maxillary sinus Haller cell
Adenoidal hypertrophy

allows for more accurate determination of surgical position and is particularly useful in extensive disease or revision cases in which more complete removal of disease and safety are particular issues.⁴ Postoperative care consists of regular in office endoscopic cleaning of the sinus cavities through an endoscope until healing is obtained.

Although very few randomized control studies are available, there does seem to be ample evidence that FESS reduces symptoms and improves quality of life in CRS without the morbidity associated with previously used, more invasive procedures such as intranasal sphenoidectomy and Caldwell-Luc. In a frequently cited study of CRS in which patients were followed for close to 8 years after surgery, 98.4% reported subjective improvement compared with their preoperative state. In the small group requiring revision surgery, an association with more severe preoperative disease by CT scan was seen.⁵

Several studies have looked at predictors for outcomes in patients with CRS after FESS. Most are in agreement that coexistent asthma, AERD, allergy including serum eosinophilia, nasal polyposis, and severe disease in preoperative CT scans are predictive of worse postoperative outcomes.

Referring physicians should be aware of the complications of FESS. In general they are much less common and much less severe than in previously used techniques. The major complications include orbital hematoma, blindness, diplopia, and cerebrospinal fluid leak.

In summary, cases of CRS with and without nasal polyps should be treated aggressively with medical therapy. Underlying medical conditions should be thought of with diagnostic tests and appropriate treatment. Patients refractory to medical treatment should be referred to the otolaryngologist.

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