



New Approaches To Management Of Sinusitis

By Robert A. Guida, M.D.

Sinusitis affects more than 30 million people in the United States. Conventional ideas of sinus disease have changed with better understanding of the anatomy and physiology of the paranasal sinuses. Acute sinusitis is initially treated with antibiotics and decongestants. Surgery is reserved for patients with impending complications or chronic sinus disease.

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Is the patient predisposed to sinus disease?

1.

For many years, maxillary sinusitis was thought to be the most common cause of acute & chronic sinusitis. Now, with the availability of nasal endoscopy and computed tomography (CT), we understand that infection in the maxillary sinus is most often due to disease in the anterior ethmoid-middle meatal complex, often called the ostiomeatal complex. Location is more significant than extent of sinus disease, both diagnostically and symptomatically. Even minor edema in a critical area can cause obstruction, leading to sinusitis. In recent years, rec-

ognition of predisposing factors in the development of sinusitis has improved. When sinusitis is severe and presents early in life, disorders such as serious immune deficiencies, immotile cilia syndrome, or possibly, cystic fibrosis must be considered. Sinusitis is also seen in approximately 30 percent of patients with acquired immune deficiency syndrome. Other predisposing factors may not be as easy to identify. Allergic rhinitis causes swelling and blockage at the ostiomeatal complex; this may lead to sinusitis. Smoking can cause edema and ciliary damage of the nasal mucosa. Many patients with chronic sinusitis have a family history of nasal polyposis or sinusitis, suggesting a familial tendency toward this disease.

Does the patient have acute sinusitis?

2.

Acute sinusitis is generally not difficult to diagnose, despite its varied and often nonspecific symptoms and signs. Acute sinusitis commonly occurs after an upper respiratory tract infection. Most often, the patient complains of pain and facial tenderness radiating over the involved sinus. Ethmoid sinusitis elicits pain or pressure in the periorbital or medial canthal area, while maxillary sinusitis presents either as pain over the cheekbone on one side of the face or as a unilateral toothache. Sphenoid sinusitis typically causes deep-seated headaches with multiple foci. Frontal sinusitis often presents as severe frontal pain and can pose a medical emergency, putting the patient at risk for intracranial

complications. Other common symptoms of acute sinusitis include nasal congestion, purulent nasal drainage, anosmia, pain on mastication, and halitosis. Fever occurs in 50 to 60 percent of patients. The most common pathogens found in patients with acute sinusitis are *Streptococcus pneumoniae*, *Hemophilus influenzae*, and *Moraxella catarrhalis*. Acute sinusitis lasts from one day to three weeks. An accurate description of the patient's disease should include the name and location (right, left, or bilateral) of the infected sinus. Subacute sinusitis is defined as any sinus infection that lasts from three weeks to three months, during which time the epithelial damage in the sinuses may be reversible. After three months, the disease is considered chronic and may involve irreversible mucosal damage requiring surgery for ventilation and drainage. Of course, acute sinusitis may be superimposed on chronic sinusitis.

Does the patient have chronic sinusitis?

3.

Chronic sinusitis is generally more difficult to diagnose than acute sinusitis and is probably under diagnosed. The pain pattern is not as obvious as in acute disease. Often, symptoms are poorly localized and mild and may mimic other conditions. One common symptom is simple nasal obstruction. In addition, the microbiology of chronic sinusitis is different from that of acute disease. Infection in chronic sinusitis tends to be polymicrobial and is most frequently associated with streptococci,

Veillonella organisms, corynebacteria, and other anaerobes. With advances in nasal endoscopy and CT imaging, the care of patients with chronic sinusitis has improved dramatically. Nasal endoscopy, using either rigid or flexible fiberoptic endoscopes, provides a superb view of the nasal anatomy and, most important, of the ostiomeatal complex. Nasal endoscopy may eliminate the need for repeated radiographic studies during and after medical therapy or after surgery. CT imaging provides excellent visualization of the sinus anatomy and the ostiomeatal complex, often demonstrating limited, yet clinically significant, disease of the ethmoid region that frequently goes unseen on plain films of the sinuses.

What diagnostic modalities are most useful?

4.

In the past, diagnosis of acute sinusitis involved transillumination of the maxillary sinus. The procedure has low sensitivity and specificity and contributes little to the evaluation by the physician who has access to modern fiber optic rhinoscopy. Ultrasonography of the maxillary sinus also has low sensitivity and specificity and has little importance in the evaluation except for follow-up of pregnant patients or those in whom radiation exposure is contraindicated. Conventional plain sinus films provide noninvasive, fast, and inexpensive evaluation of the lower third of the nasal cavity and are helpful in determining the extent of the acute disease. However, plain films underestimate the presence and extent of ethmoid or ostiomeatal complex in-

fection and are of limited use in the evaluation of chronic disease. Nasal endoscopy helps to provide information regarding the presence of ethmoid or ostiomeatal complex disease. When patients respond poorly to antibiotics, sinus irrigation should be considered to obtain an accurate culture specimen. Irrigation is also indicated for persistent infection with an underlying immunologic deficiency. CT imaging (axial and coronal cuts) is the diagnostic test of choice for patients with recurrent or chronic sinusitis. Magnetic Resonance Imaging (MRI) has limited value because during the edematous phase of the nasal cycle on T2 weighted images, normal mucosa appears to be pathologic. MRI is more sensitive than CT in detecting fungal infections, possibly because calcium is present in the fungal concretions. In addition, MRI can differentiate between neoplastic processes and inflammatory diseases in 90 percent of cases.

What medical management should be considered?

5.

To assure appropriate management of sinusitis, the effect of treatment on the ostiomeatal complex must be understood. For therapy to be effective, it must achieve control of the infection, reduce swelling of tissue to facilitate drainage, and maintain patency of the sinus ostia. Because cultures of secretions obtained from nasal swabs are known to be unreliable, it is appropriate to initiate empiric antibiotic therapy directed at the most common pathogens. Antral puncture is not indicated prior to initiating antibiotic therapy. First-line treatment of acute sinusitis consists either of ampicillin 500mg every six hours for 14 days or amoxicillin 500mg every eight hours for 14 days. A two week course of effective antibiotic treatment is usually adequate for acute sinusitis, but three to four weeks may be necessary to control chronic sinusitis. Trimethoprim (160mg)/sulfamethoxazole (800mg) one tablet twice daily is the recommended treatment for patients who are allergic to penicillin. When therapy with ampicillin or amoxicillin alone is ineffective, the combination of amoxicillin and clavulanate potassium 500mg every eight hours should work well. This combination is effective against *Staphylococcus aureus* and β -lactamase-

producing strains of *H. influenzae* and *M. catarrhalis*. In children, the combination of erythromycin and sulfisoxazole is the treatment of choice. For patients who are sick enough to require intravenous antibiotics, a second-generation cephalosporin, such as cefuroxime, should be used.

Decongestants are used to reduce tissue edema, facilitate drainage of the sinus, and maintain patency of the sinus ostia. Locally active vasoconstrictors, such as phenylephrine hydrochloride nasal spray 0.5 percent and oxymetazoline hydrochloride nasal spray 0.05 percent, should be administered for no longer than three to four days; more frequent usage of these agents may result in significant risk of rebound vasodilatation. When decongestion therapy is required for longer than three days, an oral systemic agent such as phenylpropanolamine or pseudoephedrine should be used. These decongestants reduce nasal blood flow, potentially affecting deeper levels of the ostiomeatal complex where topical agents are ineffective. Antihistamines have not been shown to be helpful in the treatment of acute sinusitis, and their use may actually interfere with drainage of purulent secretions because of the excessive dryness they cause.

When is surgery indicated for treatment of sinusitis?

6.

One of the main goals of therapy for sinusitis is to restore normal ventilation. This allows proper mucociliary clearance and, ultimately, a reversal of mucosal disease. In the past, it was believed that the lining of the sinus

becomes irreversibly damaged in sinusitis and should be completely removed, especially in cases of maxillary sinusitis. Nasal endoscopy has shown that chronic sinusitis is primarily a disease of obstruction and secondary bacterial colonization. This has led to an alteration in surgical management, away from radical stripping of the sinus mucosa and toward reestablishing ventilation and drainage, which permits the diseased mucosa to normalize over time. Surgery is focused on the area of the middle

meatus and the ostiomeatal complex, allowing disease in the maxillary and frontal sinus mucosa to eventually resolve. The fiberoptic endoscope allows excellent visualization unobtainable with a headlight or microscope so that the operation is more focused and precise in the area of involvement. The endoscope is also a valuable tool for monitoring postoperative healing. Endoscopic sinus surgery is indicated for chronic sinusitis that fails to respond to medical management. Surgery is also indicated in cases of recurrent acute sinusitis known to be related to obstruction or disease at the ostiomeatal unit. Surgery in acute sinusitis is generally limited to patients with impending complications. Other indications include removal of mucocoeles in diffuse polypoid disease; intranasal closure of cerebrospinal fluid leaks; and orbital decompression, as in cases of thyroid ophthalmopathy.

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