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MINIMALLY INVASIVE TECHNIQUES

Functional endoscopic dilatation of the sinuses (FEDS): Patient selection and surgical technique

Michael Friedman, MD,[a,b] Paul Schalch, MD[b]

From the [a]Department of Otolaryngology and Bronchoesophagology, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois; and the
[b]Division of Otolaryngology, Advocate Illinois Masonic Medical Center, Chicago, Illinois.

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Current treatment options for patients with chronic rhinosinusitis, defined by Benninger et al as a group of disorders characterized by inflammation of the mucosa of the nose and paranasal sinuses of at least 12 consecutive weeks' duration, range from medical therapy to surgical intervention in the form of functional endoscopic sinus surgery (FESS). While the potential causes of chronic rhinosinusitis are diverse, an underlying mechanism is inflammation of the mucosa that leads to edema and occlusion of the sinus ostia, which causes ineffective mucociliary clearance, mucus accumulation, and subsequent infection. Those patients without an anatomic cause for obstruction (such as polyps), who have failed medical therapy, could benefit from a procedure less invasive than FESS. Sinuplasty, a new technique of sinus ostia balloon dilatation, is specifically aimed at restoring ostium patency without removing tissue, and is performed with the patient under local anesthesia, thus decreasing the morbidity associated with FESS. In this article, we present the patient selection criteria and technical aspects of sinuplasty.

Chronic rhinosinusitis (CRS) affects approximately 31 million Americans.[1] The costs associated with medical expenditures as well as the impact on work efficiency are enormous, which makes this problem a significant priority in terms of the search for better treatment strategies supported by clinical evidence.[2] Treatment options include medical therapy, allergic management, and surgical intervention. Obviously, surgery is reserved for those patients who do not respond to medical therapy and is usually for those who have endoscopic or computerized tomography (CT) evidence of significant mechanical obstruction of the sinus ostia in the form of polyps or inflamed mucosa.[3] The goal of surgery is to reopen the sinus ostium and allow the return of ciliary function. Many patients with recurrent acute rhinosinusitis respond well to medical therapy, but sinusitis frequently recurs after treatment.

In many cases, patients have no obvious underlying mechanical obstruction affecting the ostia, or they may have mild mucosal thickening in between episodes of infection. Often, some of these patients are not considered surgical candidates because their CT findings may not justify the morbidity and risk associated with endoscopic sinus surgery. On the other hand, many are considered candidates because of the failure to control disease, but they decline surgery because of the morbidity and risks involved. Of the 37 million Americans affected by sinusitis each year (both acute and chronic),[4] approximately 31 million are affected by chronic symptoms, and approximately 330,000 undergo sinus surgery annually.[5] Thus, more than 30 million Americans continue to suffer symptoms and their associated effects on their quality of life. Some of these patients may be candidates for a minimally invasive technique to improve sinus health. Many patients who currently undergo functional endoscopic sinus surgery (FESS) may benefit from the less invasive sinus ostia balloon dilatation technique, which may be a valuable tool in conjunction with classical FESS, to cannulate the frontal sinus in difficult situations, such as revision surgery.

A Food and Drug Administration-cleared balloon catheter system has recently been introduced as a potential min-

Address reprint requests and correspondence: Michael Friedman, MD, Department of Otolaryngology and Bronchoesophagology, Rush-Presbyterian-St. Luke's Medical Center, 30 North Michigan Avenue, Suite 1107, Chicago, IL 60602.
E-mail address: hednnek@aol.com.

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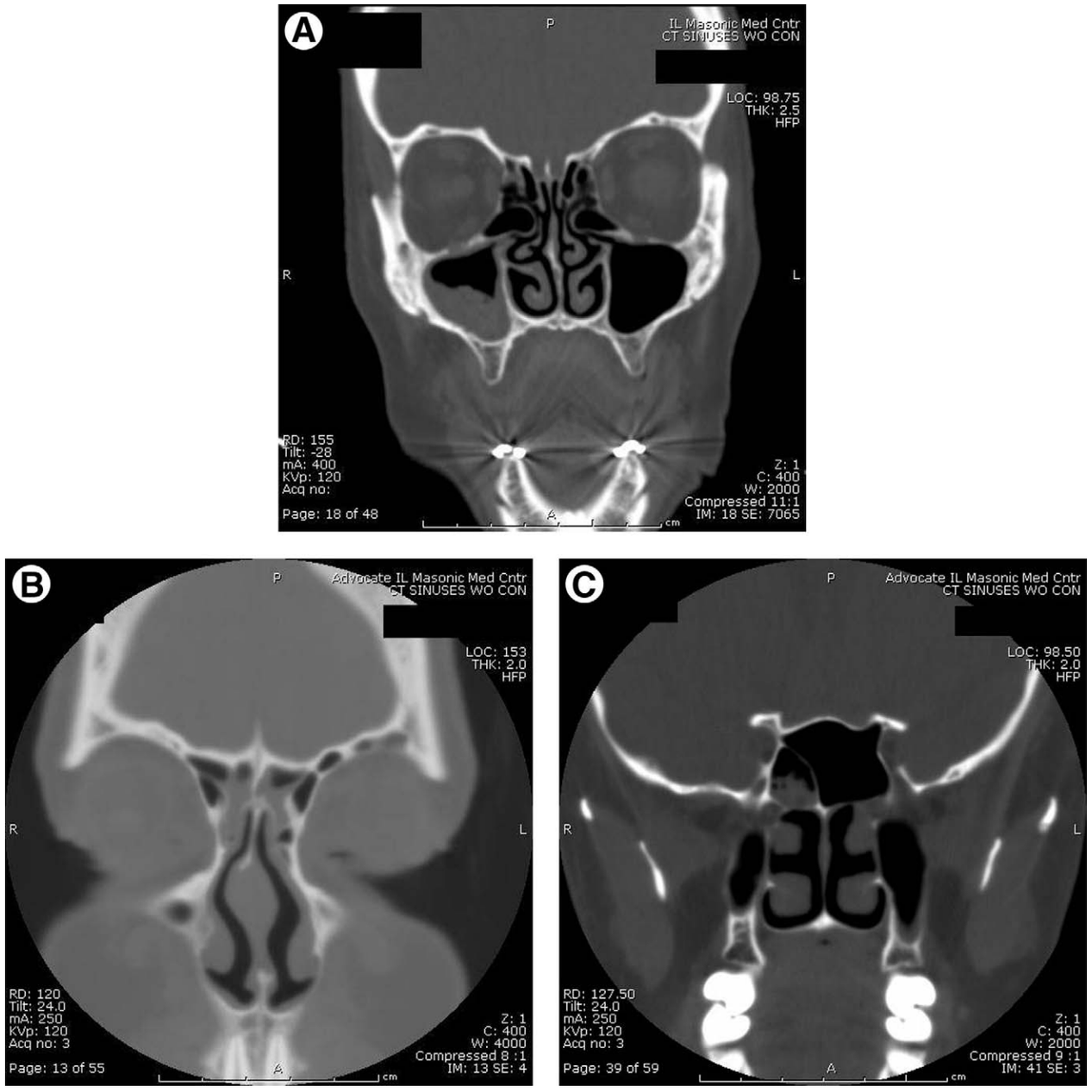

Figure 1 Noncontrast CT of the sinuses showing sinusitis of the right maxillary sinus (A), sinusitis of the bilateral frontal sinuses (B), and sinusitis of the right sphenoid sinus (C).

imally invasive, ambulatory strategy for the treatment of CRS. The system follows the principles of over-the-wire, catheter-based balloon dilatation, commonly used in vascular and urologic surgery, as well as in interventional cardiology. What this system accomplishes specifically for CRS is the dilatation of the sinus ostia by advancing balloon catheters under fluoroscopic guidance to the narrowed segment and inflating them with high pressure. This system is designed for the insertion of special catheters for sinus lavage, drainage, and antibiotic irrigation as well. The dilatation of the ostium also allows for biopsies in situations in which intrasinus masses may represent a neoplasm.

Sinuplasty provides a new set of tools, designed to dilate the natural ostia without tissue removal but with some possible tissue injury. It is not a substitute for FESS but may be an attractive option in select patients.[6] This article describes patient selection and operative technique for functional endoscopic dilatation of the sinuses (FEDS). Obviously, only long-term studies will be able to determine its efficacy and establish its ultimate place in the treatment scheme of CRS. We describe the technique for fluoroscopic-guided sinuplasty with the Relieva™ Sinus Balloon Catheter System (Acclarent, Inc, Menlo Park, CA).

Patient selection

Patient selection, as with any other surgical intervention, is an essential starting point in testing the efficacy of new surgical devices. Inclusion criteria for sinuplasty include history of recurrent rhinosinusitis, despite antibiotics, topi-