Concurrent functional endoscopic sinus surgery and rhinoplasty: pros

Becky McGraw-Wall, MD, FACS*, Allison R. MacGregor, MD

Department of Otolaryngology–Head and Neck Surgery, University of Texas at Houston Medical School, 6431 Fannin Street, Suite 6.112, Houston, TX 77030, USA

As our society has become more concerned with aging and appearance, and plastic surgery has become more available to and accepted by the general public, there has been increased demand to combine elective aesthetic surgery with medically indicated procedures. This is particularly true for rhinoplasty procedures, which are often requested by patients scheduled to undergo functional endoscopic sinus surgery. Patients frequently want cosmetic changes made to the external shape of the nose at the same time functional septal or sinus surgery is being performed. Patients often reason that the surgeon will be “in the area, anyway,” so they may as well take advantage of the opportunity to make aesthetic changes to the nose.

Often these are not unreasonable requests, because many of the symptoms attributed to chronic sinusitis may also be rhinogenic in origin, and treating one without the other may leave the patient with persistent symptoms. In addition, the twisted nose and severely deviated septum are frequently so interrelated that one cannot successfully correct either the functional airway problem or the cosmetic deformity without addressing both the internal and external nasal structures. The nasal bones and cartilaginous dorsum are dependent on the midline septal support. Deviations of this supporting structure can lead to external nasal deformities, aptly described by the old adage “As goes the septum, so goes the nose.” Simultaneous surgery allows the patient to address his or her problem with one anesthetic and one recovery period, reducing the direct costs of surgery and the lost man-hours from work as well as the patient’s overall “pain and suffering.”

Traditionally, combining elective, cosmetic surgery, such as rhinoplasty, with surgery aimed at treating an acute or chronic infection, such as sinusitis, has been viewed as ill-advised and something to be avoided. The potential risk of contaminating the cosmetic surgical field or spreading infection from the infected sinus sites into adjacent areas has been considered by some surgeons as a serious threat to the favorable outcome of the elective procedure. In theory, concurrent sinus and rhinoplasty surgery may increase the chances of complications such as bleeding, hematoma, and prolonged edema, which could delay recovery from the elective procedure or even be deleterious to its aesthetic outcome.

Despite these time-worn admonitions against combining elective nasal surgery with “clean-contaminated” sinus surgery, the risks do not seem to be as significant as was once thought. With contemporary endoscopic sinus surgical techniques and appropriate medical management of chronic sinusitis, the risk-potential is significantly reduced. Sinus surgery has become less traumatic and more effective, despite less radical resection. Endoscopic techniques do not violate the supporting structures of the sinuses and nose, unlike external approaches to the ethmoids or maxillary sinuses. Surgeons encounter less bleeding and provide more precise resection of the sinonasal pathologic condition, while leaving noninvolved structures intact. Preoperative antibiotic treatment of sinusitis, as well as the standard routines of intraoperative and postoperative antibiotic prophylaxis,
has greatly reduced the risk of potential spread of infection to the nasal or facial tissues. In light of the advances in endoscopic sinus surgery, and in appropriately selected patients, most surgeons feel comfortable recommending concurrent surgery. Rhinoplasty, septoplasty, and endoscopic sinus surgery may be combined in patients requiring sinus surgery and desiring both functional and cosmetic improvements to the nose.

Review of the literature

Many reviews in the literature exemplify the safety and efficacy of concurrent rhinoplasty and sinus surgery. Endoscopic sinus surgery itself has been shown to be safe in experienced hands, with a low complication rate of 0.69% to 2% [1–3]. Minor complications of endoscopic sinus surgery include periorbital ecchymosis, nasal synchiae, infection, and epistaxis. Major complications, including disruption of the lamina papyracea with visual loss or extraocular muscle injury, cerebral spinal fluid leak, pneumocephalus, meningitis, and frontal lobe injury, occur at rates of 0.25% to 8% [1–5]. Rhinoplasty complication rates are also low, with most surgeons reporting a 5% to 15% complication or revision rate [6]. Some of the potential complications from rhinoplasty overlap with those of sinus surgery, including epistaxis, infections, ecchymosis, septal perforation, and, rarely, severe complications such as Toxic Shock Syndrome or intracranial infections.

Several surgeons have re-evaluated the issue of performing sinus surgery and aesthetic rhinoplasty concurrently. Shemen and Matarasso [7] first reported their experience with combined nasal and sinus procedures in 1991. In eight consecutive patients, they reported no complications. In 1994, Toffel [8] documented his results with 698 patients undergoing endoscopic sinus surgery, including 122 patients who had concurrent rhinoplasty and sinus surgery. Rhinoplasty was aborted in cases where gross purulence or mycosis was present during the sinus portion of the procedure. His complication rate was low overall, with no major complications reported. Both sets of authors recommended performing septal and sinus surgery before initiating the rhinoplasty portion of the procedure.

In a review of 40 patients who underwent concurrent functional endoscopic sinus surgery and rhinoplasty, Rizk [9] staged patients based on preoperative sinonasal symptoms and radiographic findings on computerized tomography of the sinuses. The majority of patients selected for concurrent rhinoplasty and sinus surgery were rated as having mild or moderate sinus disease, using a three-category staging system. Endoscopic sinus surgery was performed first, followed by closed rhinoplasty. No alteration was made in the rhinoplasty as a consequence of the sinus surgery. Rizk identified only one minor complication in a patient who experienced an uncomplicated epistaxis 18 days after the procedure, which required nasal packing.

Friedman [10,11] recommended combined sinus surgery and rhinoplasty in select patients, excluding those patients who had stage IV sinus disease as defined using the sinus CT staging system he had previously described. However, he identified an unusual complication of concurrent rhinoplasty and sinus surgery, which occurred in two patients. Collapse of the nasal sidewall resulted after combined rhinoplasty and ethmoidectomy. Friedman presumed that exenteration of the agger nasi cells, combined with medial and lateral osteotomies, caused loss of support for the frontal process of the maxilla, resulting in its prolapse. He suggested avoiding medial osteotomies, or placing the lateral osteotomy higher than the nasofacial line to prevent this complication. Millman and Smith [12] reported a case of sepsis and frontal abscess, associated with myocarditis, following combined rhinoplasty and sinus surgery. They reviewed their own experience with 11 cases of concurrent surgeries, during which no complications occurred. Two patients had aborted rhinoplasties due to gross purulence at the time of surgery. They concluded that although concurrent surgery is safe and effective, surgeons must use sound medical judgment in patient selection; they also recommended not proceeding with rhinoplasty in the face of active sinus infection noted during sinus surgery.

Advantages

There are many advantages to combining rhinoplasty with septoplasty and endoscopic sinus surgery. Most of these are related to patient convenience; however, they also include valid points from the medical and surgical perspective.

Need for only one manipulation of the septum

Combining cosmetic rhinoplasty with endoscopic sinus surgery enjoys significant advantages over performing two separate procedures. Correction of a deviated septum is often required during both endoscopic sinus surgery and rhinoplasty. A severely deviated septum can limit surgical access to the
sinuses and may occasionally contribute to the obstruction of the sinus outflow tract. A septoplasty to correct this abnormality is frequently required before attempting sinus surgery. In rhinoplasty, a twisted nose is generally following the direction of the crooked septum supporting it. Correction of the external nasal deformity is often dependent on straightening its septal foundation. Staging rhinoplasty and sinus surgery can necessitate a second surgical manipulation of the septum. Combining these procedures reduces the possible complications of repeat septal manipulation, including tearing of the mucoperichondrial flap with septal perforation, cartilage loss or weakening with loss of dorsal or nasal tip support, and nasal synchiae. When septoplasty during sinus surgery is performed independently, without regard for future dorsal nasal reduction, inadequate cartilage for dorsal support may be left as a result of the two procedures, leading to a potential saddle deformity if the deficit is not recognized and satisfactorily reconstructed. In addition, resected septal cartilage is generally discarded as specimen during a sinus surgery/septoplasty procedure. Combining rhinoplasty with septoplasty performed at the time of sinus surgery allows the surgeon to take advantage of this valuable autographic cartilage material, which is often needed for support and augmentation in both cosmetic and functional reconstruction of the nose.

Reduced hospital stay and operative time

Patients undergoing simultaneous procedures require only one induction of and emergence from general anesthetic. This combination decreases overall anesthesia time, as well as decreasing the overall time spent in the operating and recovery rooms when compared with two separately scheduled procedures. Preparation of the nose and operating room set-up need only be performed once, also reducing operating room time. Many of the instruments used are common to both procedures, so that performing them simultaneously reduces instrument sterilization time and expense.

Reduced cost

Many patients request simultaneous rhinoplasty and endoscopic sinus surgery to decrease their total out of pocket costs. Many insurance companies will cover the costs associated with the endoscopic sinus surgery and septoplasty portions of the procedure, thereby decreasing the anesthesia and surgery center/hospital costs to the patient.

Reduced healing/recovery time

Patients undergoing simultaneous procedures need only recover from surgery once. There is only one postoperative recovery period necessitating time off from work, school, or normal physical activities. The degree of postoperative edema and nasal congestion is similar in both rhinoplasty and septoplasty/sinus surgery. Likewise, nasal packing is generally required in both functional and cosmetic procedures. Combining the two means that nasal obstruction due to postoperative edema or nasal packing is limited to a single episode, decreasing overall patient discomfort. Moreover, the nose itself need only repair itself once, decreasing potential scar formation.

Overlapping symptomatology

Functional airway problems can be related to external nasal deformities and nasal valve deficiencies, as well as to the nasal septum and turbinates. Addressing the septal, turbinates, or sinus abnormalities without correcting the external nasal deformities may leave the patient with persistent nasal airway obstruction, requiring subsequent surgery with all the disadvantages outlined above. It is well recognized that adequate correction of external nasal deformities generally entails correction of any underlying septal deviation. The converse is also true, in that external nasal deformities may contribute to functional airway obstruction. If the septum is brought to anatomic midline without correcting the adjacent nasal bone or upper lateral cartilage collapse, this procedure can result in a relative decrease in the functional airway. Likewise, repositioning of the nasal septum and nasal bones may be hampered by a concha bullosa of the middle turbinate, or even by an overly enlarged ethmoid air-cell system filling the void space resulting from the concavity of the severely deviated septum [13]. Simultaneous correction of each of these intranasal and external nasal anomalies may be required to address the functional concerns of the patient.

Patient selection

It is apparent from the literature review that combined rhinoplasty and endoscopic sinus surgery for chronic rhinosinusitis can be performed safely in most patients who have clear medical indications for endoscopic sinus surgery and a desire to improve the aesthetics of their nose. Caution should be taken in individuals with acute exacerbations of chronic si-
nusitis or gross purulence encountered during endoscopic sinus surgery. The surgeon should warn the patient about the possibility of cancellation and exercise the option of aborting the rhinoplasty portion of the procedure in the event of such findings. To help reduce the possibility of gross purulence, patients with chronic infectious sinusitis requiring endoscopic sinus surgery should be placed on an appropriate course of preoperative antibiotics, particularly if combined rhinoplasty is planned. Likewise, patients should be advised that the rhinoplasty portion of the procedure may be cancelled in the event of any complications that arise during sinus surgery. It is particularly prudent to abort cosmetic nasal surgery if orbital or skull base injury occurs during sinus surgery, or if excessive epistaxis with blood loss complicates the sinus surgery. It is essential that the sinus surgery precede the elective rhinoplasty procedure to give the surgeon the opportunity to exercise his or her sound medical judgment regarding the feasibility of continuing with the cosmetic surgery.

Patients with severe disease are less desirable candidates for concurrent rhinoplasty. Preoperative CT scanning of the sinuses more clearly identifies sinonasal anatomy and the extent of pathologic conditions. CT staging systems [11,14,15] help define the severity of rhinosinusitis and assist surgeons in identifying patients who can safely undergo concurrent surgery. There are many different proposed CT staging systems currently published in the literature. The American Academy of Otolaryngology–Head and Neck Surgery has adopted the modified Lund-Mackay system of staging chronic sinusitis as a simple, unified system for grading the extent of sinus disease (Table 1). Patients with limited sinus disease or disease isolated to one or two sinuses per side and patients without widespread mucosal inflammatory or polypoid changes are better candidates for combined rhinoplasty and endoscopic sinus surgeries. Patients with extensive opacification of most or all of their sinonasal cavities are not ideal candidates for simultaneous rhinoplasty. Concurrent rhinoplasty should be discouraged in patients with diffuse polyps because of the greater likelihood of intraoperative bleeding and other complications.

Friedman [10] identified Stage IV disease as a contraindication for concurrent surgery using his classification system; Stage IV includes those patients with contiguous mucosal thickening involving the ethmoid labyrinth with massive involvement of other sinuses (not necessarily all sinuses), who are clinically unresponsive to medication. In particular, frontal sinus disease and the need for endoscopic frontal sinusotomy may be a relative contraindication to simultaneous rhinoplasty, because of the instability of the frontal process of the maxilla that may result from removal of the agger nasi and frontal recess cells when the procedure is performed in combination with medial and lateral osteotomies.

Patients with chronic rhinosinusitis in the face of systemic illnesses such as nasal sarcoid, cystic fibrosis, primary ciliary dyskinesia, or Wegener’s granulomatosis should not be considered for simultaneous surgery, because of the chronic, generally unremitting nature of their mucosal disease. Likewise, patients who have systemic medical conditions that make them less desirable candidates for surgery or who have poor wound healing capabilities, such as patients with poorly controlled hypertension or asthma, diabetes mellitus, or immunodeficiencies, should be advised against concurrent rhinoplasty procedures.

### Table 1

<table>
<thead>
<tr>
<th>Sinus</th>
<th>Left</th>
<th>Right</th>
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<tbody>
<tr>
<td>Maxillary (0,1,2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anterior ethmoid (0,1,2)</td>
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<td></td>
</tr>
<tr>
<td>Posterior ethmoid (0,1,2)</td>
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<tr>
<td>Sphenoid (0,1,2)</td>
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<td></td>
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<tr>
<td>Frontal (0,1,2)&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ostiomeatal complex (0,2)&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>Total points</td>
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Each sinus cavity is scored based on the extent of sinus opacification. 0, no abnormalities; 1, partial opacification; 2, total opacification. Total score ranges from 0 to 24, with a maximum of 12 on each side.

<sup>a</sup> 0, absent frontal sinuses receive a score of 0.

<sup>b</sup> 0, not occluded; 2, occluded.


### Summary

There are no absolutes in life, and this is certainly mirrored in the practice of medicine. Despite historical concerns about the spread of infection from the sinuses to the nasal tissues, concurrent septorhinoplasty and endoscopic sinus surgery may be performed safely in most patients who meet the criteria for sinus surgery and who desire realistic aesthetic alterations to their external nasal appearance. However, otolaryngologists should use good medical judgment in selecting patients appropriate for the combined procedures. Patients with extensive sinus pathology or systemic illness are not the ideal candi-
dates for concurrent surgery. It is recommended to perform the septal and sinus surgery first, so that the surgeon may postpone the elective rhinoplasty procedure if unfavorable intraoperative circumstances develop. Staging the rhinoplasty procedure is advised in the event of gross purulence found during the sinus dissection, or in the event of an untoward complication of the functional sinonasal procedures. The generally low complication rate of endoscopic sinus surgery, as well as the practice of preoperative antibiotic prophylaxis, makes this an unlikely occurrence; however, surgeons should prepare patients for this possibility during preoperative counseling. Overall, when performed in carefully selected patients, contemporaneous rhinoplasty and endoscopic sinus surgery is safe and effective and offers many advantages for the patient.

References