

Secondary Rhinoplasty and the Use of Autogenous Rib Cartilage Grafts

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KEYWORDS

- Rhinoplasty • Revision rhinoplasty • Secondary rhinoplasty
- Rib cartilage graft • Costal cartilage

Rhinoplasty is generally considered to be one of the most difficult procedures in cosmetic surgery, and the incidence of postoperative nasal deformities that require secondary rhinoplasty varies from 5% to 12%.¹ Deformities arising from an earlier rhinoplasty can range in severity from mild asymmetry of the nasal tip or dorsum to severe distortion and collapse of the osseocartilaginous framework. Regardless of the severity, the causes of postoperative rhinoplasty deformities are most frequently related to: (1) displacement or distortion of anatomic structures, (2) inadequate surgery resulting in under-resection of the nasal framework, or (3) over-resection caused by overzealous surgery.

Success in secondary rhinoplasty, therefore, relies on an accurate clinical diagnosis and analysis of the nasal deformities, a thorough operative plan to address each abnormality, and a meticulous surgical technique. Reconstruction of the osseocartilaginous framework is the foundation for obtaining consistent aesthetic and functional results in secondary rhinoplasty. Septal cartilage is generally considered to be the preferred grafting material for most applications in rhinoplasty, but secondary rhinoplasty frequently necessitates alternative sources of grafting material when there are severe structural deformities of the nasal framework or when insufficient amounts of septal

cartilage are available.^{2,3} In some cases, auricular cartilage may be suitable; however, rib cartilage provides the most abundant source of grafts and has proved to be the most reliable in the authors' hands when addressing major secondary deformities.

Although adequate results may be obtained with the endonasal technique in certain circumstances, the limited dissection and exposure offered by the endonasal approach often does not permit accurate assessment, intraoperative diagnosis, and appropriate treatment of complex anatomic problems. The authors, therefore, prefer addressing most secondary rhinoplasty deformities by the external approach to help ensure consistent aesthetic and functional results.

CLINICAL ANALYSIS AND OPERATIVE PLANNING

A thorough nasal analysis and precise anatomic diagnosis of each deformity (**Table 1**) is a key step for achieving optimal results in secondary rhinoplasty. Preoperative evaluation begins by defining the deformity, which is accomplished by a detailed history, physical examination, and complete aesthetic, facial, and nasal analysis. The nose should be examined and analyzed from top to bottom. Starting superiorly, the height, the

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Table 1
Common postoperative rhinoplasty deformities

Dorsum	Tip
Over-resection	Asymmetry
Dorsal irregularity	Alar collapse
"Polly-beak" deformity	Alar retraction
"Inverted-V" deformity	Hanging columella
Saddle deformity	Retracted columellar-labial angle
	Over-rotation of tip

width, and the symmetry of the dorsum should be noted. The nasofrontal angle normally begins at the supratarsal crease and may be noted to be lower in patients with an over-resected dorsum. The contour of the dorsum should be assessed and any irregularity should be noted. The width of the bony pyramid and upper lateral cartilages should be inspected for asymmetry, collapse, and for the presence of an "inverted-V" deformity. The supratip area is evaluated for the presence of a "polly-beak" deformity or absence of an appropriate supratip break. The nasal tip is evaluated in terms of its projection and its rotation. The lower lateral cartilages are assessed for their symmetry, width, position, and symmetry of the tip-defining points. The alar rims are inspected for collapse or retraction. The columella is examined for increased or decreased show. The columellar-lobular and columellar-labial angles are evaluated to ascertain the desired angulation. The internal nasal examination evaluates patency of the nasal valves, position and integrity of the septum, and state of the turbinates.

Another important aspect of the preoperative evaluation is the assessment of the patient's psychological status and stability. It has been estimated that 5% of patients seeking cosmetic surgery have body dysmorphic disorder, which is a preoccupation with a slight or imagined defect with some aspect of their physical appearance that leads to significant disruption of daily functions.⁴ It is important to distinguish patients with a legitimate cosmetic or functional concern from patients who are hyperconcerned about minor imperfections of their nose.

After the patient has been deemed a good psychological candidate and the deformities defined, the goals of the surgery should be established and an operative plan formulated to address each abnormality. The operative goals are individualized for each patient according to the deformity. The goals may be to augment the dorsum, to straighten a dorsally deviated septum, to lower

the supratip area, to correct tip asymmetry and alar collapse, to decrease columellar show, and so forth. If the existing osseocartilaginous framework is under-resected, the amount and location of further reduction are determined. If the nasal framework has been over-resected, the missing tissues and the need for augmentation are determined. Secondary surgery is usually deferred until 12 months after the previous rhinoplasty.

ASSESSMENT OF GRAFTING REQUIREMENTS

A key component of operative planning in secondary rhinoplasty includes assessment of the grafting requirements and determination of the potential source of grafting materials that will be required. Secondary rhinoplasty often necessitates significant numbers of grafts, such as spreader graft, lateral crural strut grafts, and dorsal onlay grafts when structural deformities result from previous procedures.² The authors prefer autogenous cartilage for any nasal framework replacement. Successful use of irradiated homologous rib cartilage has been reported in the past,⁵ but problems with infection, absorption, and warping have limited its routine use in secondary rhinoplasty (Dingman RO, personal communication, 1980).

Septal cartilage is generally the preferred grafting material in primary and secondary rhinoplasty. The integrity of the nasal septum, and thus its availability for use as cartilage grafts, can be assessed during the office consultation and examination by gently palpating the septum with a cotton tip applicator. There are several advantages to using septal cartilage. A large amount of septal cartilage and septal bone can be harvested from the same operative field without the morbidity of an additional donor site. Compared with auricular cartilage, septal cartilage is more rigid, provides better support, and does not have convolutions. Septal cartilage is preferably used as a columellar strut, spreader grafts between the

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