Operative Techniques in Otolaryngology (2008) 19, 72-78

ELSEVIER

Operative Techniques in

Otolaryngology

Augmentation rhinoplasty with silicone prostheses

John A. McCurdy, Jr, MD, FACS

From the University of Hawaii, Honolulu, Hawaii.

KEYWORDS:
Augmentation rhinoplasty;
Asian rhinoplasty;
Nasal alloplasts

Augmentation rhinoplasty using silicone prostheses is a procedure that has gained wide acceptance, particularly in Asia, but has been met with resistance among Western surgeons. Much of the reluctance to employ this method is related to misconceptions regarding planning and executation of the operation. The basic principles of nasal augmentation stressing operative philosophy as well as technical principles that contribute to safe and esthetically pleasing results are presented.

Augmentation rhinoplasty is a challenging procedure that demands focused attention to achieve consistent esthetic results. The choice between autogenous or alloplastic materials remains a topic of intense controversy which has been discussed in detail elsewhere.[1] As a relative contraindication to alloplastic augmentation, particularly with regard to silicone prostheses, related to inadequate skin coverage, use of such implants is generally reserved for the Asian noses as well as the occasional black nose and other non-White hypoplastic noses* rather than in White patients who generally exhibit thinner nasal skin.

Assuming that silicone elastomer has been chosen for augmentation, the challenge is the same as for all surgery: formulation of a surgical approach that minimizes potential problems. Such an approach to augmentation rhinoplasty rests on a foundation consisting of four key pillars: (1) implant design and fabrication, (2) surgical technique per se, (3) adequate postoperative follow-up enlisting the patient as a partner in early detection of potential problems, and importantly, (4) the surgeon's conception (or "mindset") of the precise goals of surgery.

Regardless of whether a nose requires reduction or augmentation, the esthetic goals of rhinoplasty are the same: creation of a strong, smooth dorsum exhibiting a prominent origin at the nasion but not competing with the tip as the leading point of the nasal profile. Ideally, the lobule should be delicate and well-defined with definite columellar "show" and an oblique anterioposterior orientation of the nares.

In the West, rhinoplasty is taught as a progressive series of steps, by far the most important of which is modification of the nasal lobule. Young surgeons are taught to first fix the position or projection of the tip and then alter the dorsum to complement tip position. Inadequate or excessive surgical manipulation of the lobule constitutes a virtual "kiss of death" for the entire rhinoplasty procedure. Surgery of the dorsum, in contrast, is relegated to the "back burner," being virtually an afterthought, consisting of a mundane series of maneuvers that are relatively easy and forgiving of all but the most glaring of errors.

When, however, a Western surgeon conceives of augmentation of the hypoplastic nose, his primary consideration is modification of the dorsum, lobular esthetics playing a secondary role. Early versions of dorsal prosthesis produced in the West provide graphic evidence of this observation. Attempts to refine and sculpture the lobule with conventional Western tip plasty techniques rarely bear fruit as a consequence of the anatomy of the lower lateral cartilages, a fact that contributes to the relative neglect of this area.

I attribute whatever success I have achieved in performing and teaching augmentation rhinoplasty in the hypoplastic nose largely to my persistence in retaining the western concept of modification and enhancement of the lobule as a primary goal of this procedure, just as I do when performing reduction rhinoplasty.

A collateral benefit of this mindset is the additional margin of safety provided by virtue of the fact that the

Address reprint requests and correspondence: John A. McCurdy, Jr, MD, FACS, University of Hawaii, 1188 Bishop Street, Suite 2402, Honolulu, HI 96813.

E-mail address: johnmccurdy@hotmail.com.

*In an effort to avoid confusion, I refer to those noses that benefit from augmentation with alloplastic prostheses as "hypoplastic," ie, exhibiting hypoplasia of the dorsum. In most such noses, the lobular skin and subcutaneous tissue is thick and the lower lateral cartilages are thin.

1043-1810/$ -see front matter © 2008 Elsevier Inc. All rights reserved.
doi:10.1016/j.otot.2008.01.001

physical limitations of lobular augmentation are easily visualized intraoperatively if this area is the surgeon's primary focus. If the primary goal is dorsal augmentation, there is a temptation to "fit" the lobule to a more aggressively modified dorsum, a prescription for disaster as lobular augmentation is the "weak link" of this procedure.

Thus, dorsal augmentation is rarely performed in isolation, ie, without consideration of lobular modification, these two goals being accomplished with an L-shaped silicone prosthesis rather than a dorsal prosthesis alone. Some surgeons advocate use of silicone implants for dorsal augmentation while recommending that lobular modification is "probably" best performed using classical tip rhinoplasty techniques or enhancement with autogenous materials if necessary. However, techniques of tip rhinoplasty that are highly successful in the White nose are usually unsatisfactory in hypoplastic noses because the attenuated lower lateral cartilages lack sufficient strength to accentuate tip projection and support, and the overlying skin and subcutaneous tissue is too thick to reflect sculpturing of the delicate cartilage. Thus, if tip projection is to be enhanced, the surgeon must generally reinforce or buttress lobular cartilage with cartilage grafts. Whereas such techniques often prove satisfactory for lobular enhancement alone, when accompanied by a dorsal alloplast, discontinuity between the dorsum and lobule is all too common, frequently being unapparent until final resolution of postoperative edema or later in the postoperative period. In contrast, continuity between dorsum and lobule is a major advantage of L-shaped silicone prostheses. Also, dorsal prostheses not stabilized proximally by a continuous columellar component are more likely to drift from the midline (generally as a consequence of asymmetrical scar contracture) in the postoperative period. One final consideration is the fact that the dismal results associated with poorly designed silicone dorsal implants manufactured and sold in the United States for correction of "saddle nose" deformities in the late 1970s rank as a leading cause of the disrepute of silicone nasal prostheses.

Implant design

The silicone implant that I designed and currently use consists of three segments each having distinct characteristics and functions: a dorsal component, a lobular component, and a columellar strut (Figure 1). All three components are made of soft silicone elastomer, of particular importance in that softness and flexibility translates into diminished pressure at the tissue-prosthesis interface resulting in less stress on the overlying skin. Historically, the first generation of silicone nasal implants designed in Asia were fabricated from hard elastomer and tended to be of excessive size, factors which contributed to complications, most notably implant exposure.

The soft, flexible dorsal component has a groove on its posterior surface allowing apposition to the dorsum. All edges are tapered to facilitate inconspicuous blending, thus minimizing prosthesis palpability or visibility.

The soft lobular component is smooth and broad (as opposed to narrow and pointed), a configuration designed to minimize and diffuse pressure on the overlying lobular skin. Anterior projection of the lobular component is 2 mm greater than that of the dorsal component. The final relative projection of these two components is generally adjusted on an individual basis by intraoperative sculpting of the prosthesis. Lobular projection is achieved by a cantilever mechanism of the combined dorsal and lobular components rather than by a tent-pole mechanism involving the columellar strut.

Figure 1 The L-shaped soft silicone prosthesis. (Color version of figure is available online.)

The most misunderstood component of the L-shaped nasal implant is the columellar strut. Perhaps because surgeons who utilize struts of autogenous material teach that postoperative lobular position is a function of the thrusting action of these struts, it is assumed that the alloplastic strut functions in a similar manner. Utilization of the strut as a tent pole to increase tip projection, however, is a prescription for disaster.

In actuality, the columellar strut has two functions. First, it stabilizes the proximal (lobular) segment of the implant in the midline, thus providing resistance against displacement and malposition. Secondly, the strut allows sculpturing of the columella by displacing the characteristically retracted columella of the Asian nose inferiorly, thus increasing its "show." An understanding of these two functions of the columellar strut allows the surgeon to resist any temptation to extend the strut the full length of the columella thereby producing an undesirable "tent-pole" effect, because to perform its two functions, the columella strut need only extend 50% to 75% of the columellar length.

In earlier years, I believed that a columellar strut fabricated from firm elastomer was preferable as it could be relatively short and thin because of the resistance of the firm elastomer to deformation. This belief, however, proved to be erroneous because contraction of the fibrous capsule that naturally forms around the prosthesis often exerts a rotational force which occasionally results in displacement of the strut laterally. Pressure from such displacement may result in perforation in the vestibular aspect of the columella, ie, the site of the incision, by far the most common site of implant exposure. The rotational forces are less likely to be effectively transmitted to a columellar strut fabricated from soft elastomer because of the flexibility at the lobular–