Reconstruction of Nasal Tip and Columella

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KEYWORDS

• Nasal reconstruction • Skin cancer • Nasal tip • Columella
• Inner lining • Nasal defect

TIP RECONSTRUCTION

Tip defects are common, bearing a potential for considerable aesthetic and functional deformity. Of the 850 nasal defects treated in the authors' department, 325 involved the nasal tip, of which 70 were through-and-through defects. Because of its unique individual characteristics, reconstruction of the nasal tip is a challenging endeavor. The range of reconstructive options varies in complexity from simple grafting to 3- or 4-stage reconstruction with regional flaps. To sculpture a structure that simulates the nasal tip while allowing normal nasal function, the reconstructive surgeon is impelled to turn to current rhinoplasty knowledge and expertise. This expertise involves the application of both functional and aesthetic nasal analysis and modern rhinoplasty techniques to the reconstructive problem. Indeed, nowhere is the line between nasal reconstruction and rhinoplasty so blurred than in rehabilitation of defects of the nasal tip.

Tip Anatomy

The nasal tip is a biconvex structure. It is unique in that it is the only nasal subunit that shares a common border with all remaining subunits of the nose (columella, dorsum, ala, soft triangle, sidewall) (**Fig. 1**).

The shape and position of the nasal tip is determined both by the structure and position of the alar cartilages and by its skin, soft-tissue covering. Differences in skin characteristics, even within the nasal tip, can be appreciated. The majority of the nasal tip lies within a thicker skin zone, richly populated with sebaceous glands. The lower portion of the infratip lobule and soft triangle (separate subunit but juxtaposition to the tip subunit) lie within a zone with skin that is thinner, smooth, nonsebaceous, and adherent to the underlying cartilage.[1] Obviously, as the replaced alar cartilage must mimic normalcy, the choice of skin covering must fit the preexisting state.

In frontal view, the nasal tip unit consists of 2 halves or subunits. In profile, one may discern the supratip and infratip lobule. The lower lateral cartilage (LLC) largely determines these transitions from one area to another and thus contributes to the development of the double break, tip defining point, and supratip break point (**Fig. 2**). The transition of the medial crus to the intermediate crus forms an angle, which translates as a double break. This point is the most anterior point of the columella in profile and determines the transition from columella to infratip region. The highest point of the domal segment corresponds to the tip-defining point on each side. This pair of tip defining points is usually manifested externally by light reflexes. The supratip lobule ranges from the tip-defining point to the supratip break point. As the cephalic edge of the lateral crus slopes posterior it meets the dorsal septum producing the supratip breakpoint. This landmark defines the junction of the nasal dorsal and tip subunit. The transition from ala to nasal tip may best be assessed in basal view and is marked as the deepest point in this concave area (**Fig. 3**).

It may be clear that the shape of the cartilages translate as surface characteristics with, in

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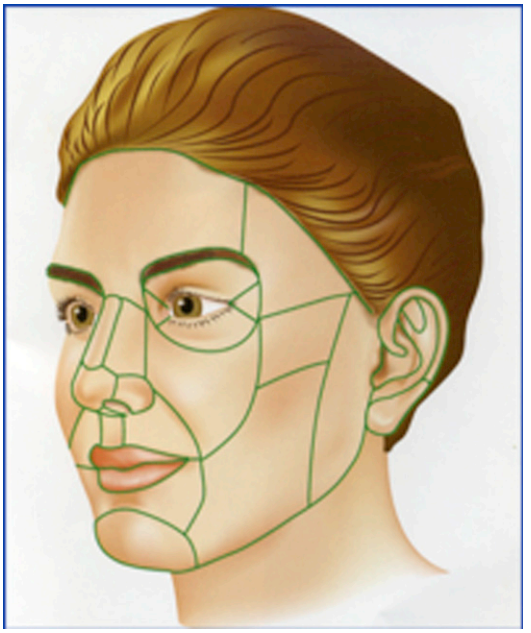

Fig. 1. Facial subunits. (*From* Vuyk HD, Lohuis, PJFM. Facial plastic and reconstructive surgery. 1st edition. Hodder Arnold; 2006. No. 1; with permission.)

general, gently flowing hills and valleys. The transition in shape from convex to concave does represent the borders of the nasal tip subunit. The delineation of the boundaries on the nose between concave and convex surfaces, which results in differences in light reflection and shadowing,

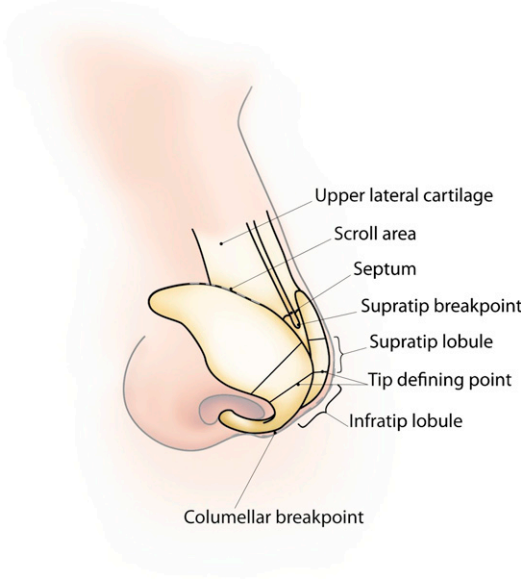

Fig. 2. Oblique view showing cartilaginous framework of nasal tip.

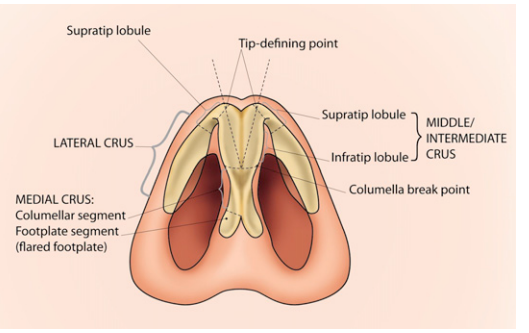

Fig. 3. Basal view showing relationship to underlying cartilaginous framework.

may be clear or sometimes less defined. However, they present opportunities to hide the reconstructive scars in areas where a transition is expected, making them less readily apparent to the eye.

Placing the scar in the previously mentioned areas might imply enlargement of the defect. Indeed, given the advantage of scar camouflaging one may go so far that if 25% to 50% or more of the nasal subunit is involved, the excision of the remaining subunit is considered.[2,3] For example, smaller defects limited to one-half of the nasal tip may be converted to a hemi-tip unit defect. The unaffected other half remains, and can be used as a template to mirror exactly the reconstruction. The vertical midline scar naturally divides the tip into an equal left and right half. For more extended tip defects, the whole nasal tip may be resurfaced. It must be stressed that if the transitions of the subunit are not clear, the aesthetic sense helps to delineate a further resection so that the size of the tip remains in harmony with the remaining nasal dimensions. Defects of the nasal (hemi or total) tip unit dictate more extensive reconstruction with the forehead flap. This point is subsequently discussed in more detail.

Tip Dynamics

In reconstruction of the nasal tip, a basic understanding of tip dynamics is helpful to appreciate the changes that occur by resections and of the steps one should follow in reconstructing the changes in nasal tip shape, position, and function. For example, skin-only resection may lead to loss of tip projection. Similar to external rhinoplasty, the skin has been lifted off the alar cartilages and thus one of the minor tip support mechanisms (skin-cartilage attachment) is damaged. Specifically in large resections, when part or all of the alar cartilage is missing, the reconstructed LLC must bear the weight of the whole reconstruction and withstand the retractile forces that will inevitably