Nasal Tip Refinement in Primary Rhinoplasty: The Cephalic Trim Cap Graft

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Background: Commonly used techniques for achieving nasal tip projection and refinement are adequate for most primary rhinoplasty patients, but they may result in undesirable tip bifidity and visible lower lateral cartilage angularity, especially in patients with thin skin.

Objective: We report the use of “like” local tissues, cephalic trim cartilage remnants of the lower lateral cartilages, as invisible tip grafts to soften any angular cartilage edges or tip bifidity.

Methods: The cartilaginous framework was exposed by using the open rhinoplasty approach. Lower lateral cartilages were separated from upper lateral cartilages, the caudal septum at the anterior septal angle, and from each other. A cephalic trim was performed as necessary, with the cartilaginous segments preserved for use as a cap graft. Interdomal sutures and transdermal sutures were used either alone or in combination to set the desired tip projection. If tip bifidity was visible through thin nasal tip skin, a cephalic trim cap graft was placed.

Results: The procedure can achieve a well-unified nasal tip with no evidence of bifidity, angularity, or cartilage graft visibility.

Conclusion: Use of this technique to improve nasal tip projection can avoid undesirable tip bifidity and visible lower lateral cartilage angularity in patients with thin nasal skin. (Aesthetic Surg J 2002;22:39-45.)

During the past 15 years, a dramatic shift has occurred in the approach to the nasal tip in rhinoplasty. The use of destructive cartilage resection and routine placement of tip grafts have led to incremental techniques that are nonpalpable and nondestructive and rely on precisely selected and placed tip alteration and definition sutures performed through the open rhinoplasty approach.1-7 For most primary rhinoplasty patients, suture techniques combined with columellar strut grafts should be all that are required to achieve the desired changes in tip projection and refinement. In the patient with thin nasal skin, however, suture techniques alone may lead to undesirable tip bifidity and angularity of the domal cartilages. Furthermore, standard tip grafting techniques can lead to palpable and visible tip deformities, which are clearly undesirable.
This article presents our approach to this common problem, using “like” locally available tissues (ie, cephalic trim remnants) as tip cap grafts. Cephalic trims are frequently necessary in the patient with thin skin who desires nasal tip refinement. The patient with a bulbous or boxy tip will usually require a cephalic trim to allow domal repositioning with suture techniques. Furthermore, patients with lateral supratip fullness are treated with cephalic trims. The resulting cartilage remnants are uniquely suited as tip grafts because they are unusually thin and pliable and have no angular edges. They are essentially invisible even through thin nasal skin, and can be used to soften any edges or bifidity after tip refinement with suture techniques.

**Aesthetic Analysis**

Aesthetic analysis of the patient is the cornerstone of successful rhinoplasty. The aesthetic analysis of any cosmetic patient, especially a rhinoplasty patient, should begin with an assessment of the skin. In the patient with thick skin, tip refinement is very difficult and frequently requires seemingly exaggerated overcorrection to achieve desired results. Similarly, in the patient with thin nasal tip skin, even minor changes and subtle cartilage angularity will appear pronounced. The use of tip grafts in this patient population is especially problematic because standard sources of cartilage (septum, ear, and rib) are relatively firm, nonmalleable, and angular and tend to lead to undesirable, obviously operated results.

Tip assessment proceeds with an analysis of the adequacy of tip projection. Approximately 50% to 60% of the tip should project anterior to the anteriormost projecting point of the upper lip (Figure 1). Ideal tip projection may be further defined as 0.67 times the ideal nasal length (Figure 2). The inadequately projected tip may demonstrate increased alar flare, a short columella, or incorrectly shaped and inclined lower lateral cartilages. There may be deficient medial crura that contribute to an imbalance of the normal columella:infratip ratio of 2:1. This proportion must be balanced to provide adequate tip projection.

Tip assessment concludes with an analysis of tip shape, including the supratip, tip, and infratip lobule. An aesthetic tip shape includes 1 to 2 mm of supratip break (in female patients) (Figure 3). There should be a columellar-lobular angle of 45 degrees (Figure 4). Furthermore, the amount of infratip lobular show should approximate the amount of tip visible above the tip defining points to the supratip break region. The tip should not possess...
bifidity, but rather have a unified appearance, with the tip defining points symmetrically positioned. The lateral tip should be assessed for excess fullness caused by overly full domal and/or lateral crura of the lower lateral cartilages.

**Technique**

A simplified approach to tip refinement and projection with use of the open rhinoplasty approach in the thin-skinned patient employs primarily nondestructive suture techniques, columellar strut grafts, and cephalic trim cap grafts.

The open approach was used in our rhinoplasty patients with difficult tip problems that required additional projection or tip refinement. The cartilaginous skeleton was widely exposed in standard fashion. A transcolumellar stair-step incision was made and connected with bilateral intracartilaginous incisions (Figure 5). The nasal soft tissues were carefully separated from the lower lateral and upper lateral cartilages, dividing the suspensory ligament of the tip. The lower lateral cartilages were widely released from the upper lateral cartilages, from the septum at the anterior septal angle, and from each other. The length, strength, and shape of the lower lateral carti-
lages were assessed to determine the combination of techniques that would be necessary to achieve the desired amount of tip projection and refinement.

Cephalic trims then were performed as necessary to begin to achieve the desired tip shape. The exact location of these trims depended on the deformity being corrected. The boxy or bulbous tip generally required trim of the medial portion of the lateral crus. This trim may also extend to include a cephalic trim of the domal portion of the lower lateral cartilage in the case of the boxy tip with wide (more than 4 mm) domal cartilages (Figure 6). The cartilaginous remnants of these trims were saved for use as tip cap grafts. It is important to maintain at least a 6-mm lower lateral cartilage rim strip to maintain long-term support and integrity of the external nasal valve. As much lower lateral cartilage as possible was maintained while still allowing adequate aesthetic reshaping and tip refinement.

Intracrural columellar strut grafts were placed and secured as necessary with 5-0 PDS sutures (Figure 7). Two types of tip refinement sutures were used, either alone or in combination: interdomal sutures and transdomal sutures. The interdomal sutures were placed between the domal segments of the middle crura of the lower lateral cartilages to increase infratip columellar projection and/or refinement, or to further increase tip projection (Figure 8). When domal asymmetry was present, either unilateral or bilateral individual transdomal sutures were placed between the domal and lobular segments of the middle crus. The tails of the individual transdomal sutures were left long; if a further narrowing of the tip-defining points was desirable, these tails were tied together, taking care not to overtighten them, as this would cause alar pinching or collapse (Figure 9). This technique was especially useful in patients with a bulbous or boxy tip deformity.

Adequate tip projection and refinement were achieved by using only these 3 suture techniques alone or in combination in approximately 60% to 70% of primary rhinoplasty patients. Constant reassessment of the effects of each suture was performed by frequent skin redraping, followed by visual and palpatory assessment of the effects of
the alterations. If the effect of a suture was undesirable, the suture was simply removed and/or replaced. It was important to remember that as the patient healed, 1 to 2 mm of tip projection would be lost before the final postoperative result was achieved.

Suture techniques combined with cephalic trims were sufficient to achieve the desired amount of tip refinement in most primary rhinoplasty patients. If, in the patient with thin skin, these techniques resulted in undesirable tip bifidity or irregularity, tip grafts had to be used; however, standard cartilage grafts may be visible through thin nasal skin. In these patients, cephalic trim cap grafts were placed to soften the domal projecting points of the lower lateral cartilages and eliminate bifidity. The graft was first trimmed to be symmetric. It was then positioned over the nasal tip with the domal portion lying immediately over the most projecting point of the nasal tip (Figure 10). The graft was secured in place with 2 5-0 PDS simple sutures (Figure 11). The first was placed between the caudal part of the graft and the columellar strut of the medial portion of the feet of the medial crura. The second securing suture was placed between the cephalad part of the graft and the anterior septal angle at the supratip region. The skin was then redraped and the adequacy of the graft was inspected.

Case Study

A 29-year-old woman presented for an aesthetic rhinoplasty. Preoperative analysis revealed thin nasal skin with an under-projected bulbous nasal tip. Her tip further revealed infratip lobular fullness, under-rotation, and lateral supratip fullness with an ill-defined supratip break. She also had excess dorsal projection and an overactive depressor septi muscle.

She was treated with the open rhinoplasty approach. Bilateral cephalic trims were performed, leaving a 6-mm lower lateral strip. A 3-mm component dorsal reduction was performed, followed by rasping of the bony dorsum. A conservative caudal septal reduction allowed for tip

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**Figure 9.** Individual transdomal sutures. (Reprinted from Gunter et al8 with permission.)

**Figure 10.** The cephalic trim cap graft secured in place over the most projecting point of the nasal tip. (Reprinted from Gunter et al8 with permission.)

**Figure 11.** Intraoperative view of the cephalic trim cap graft secured in place with 5-0 PDS.
Figure 12. A, C, E, G, Preoperative views of a 29-year-old woman with thin nasal skin. B, D, F, H, Postoperative views 1 year after bicephalic trims, dorsal reduction, conservative caudal septal reduction, cephalic trim cap grafting, and depressor septi release.
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rotation. Tip refinement was achieved with transdomal and interdomal sutures. The refined tip was then softened to further unify its appearance through the thin nasal skin with a cephalic trim cap graft secured with 2-5-0 PDS sutures. Lateral osteotomies were done to close the open roof. Finally, a depressor septi release was performed.

Figure 12 shows the results 1 year after surgery. The anterior view shows narrowing of her tip-defining points with excellent maintenance of her dorsal aesthetic lines. The lateral view shows good balance between the dorsum and tip with an attractive dorsal profile, supratip break, lobular columellar angle, and tip rotation. The basal view confirms adequate tip projection and refinement. The tip is well unified with no evidence of bifidity, angularity, or cartilage graft visibility.

Discussion

Successful rhinoplasty depends on maintaining adequate nasal tip projection and achieving the desired tip refinement. Our approach during the past 15 years has tended toward the use of the open rhinoplasty approach with primarily incremental, nondestructive techniques of columellar struts and tip sutures. These techniques have been sufficient to achieve the desired tip refinement and projection in 85% of our primary rhinoplasty patients. However, we have found a tendency toward undesirable tip bifidity and visible lower lateral cartilage angularity, especially in patients with thin skin. Traditional tip grafting techniques with grafts fashioned from septal cartilage consistently leads to similarly visibility.

Our approach to the problem of tip bifidity and angular cartilage visibility relies on the basic plastic surgery principle of using like local tissues for reconstruction whenever available. Caudal lower lateral cartilage cephalic trims are frequently performed as part of the operative plan in an aesthetic tip rhinoplasty. These cartilage remnants of the lower lateral cartilages serve as perfect tip grafts because they will be invisible, even through thin nasal skin, serving only to soften any angular cartilage edges or tip bifidity.

References