Nasal Tip Deprojection in Rhinoplasty

Shaishav Datta, MD[1]
Buğra Tugertimur, MD[2,3]
Steven A. Hanna, MD[2]
Paige Goote, MD[2]
Matthew Morris, MD[4]
David Mattos, MD, MBA[2,3]
Richard G. Reish, MD[2,3]

Toronto, Ontario, Canada; and New York and Mineola, NY

Background: Rhinoplasty is one of the most commonly performed facial operations in the United States, and many major and minor nasal tip support structures affect tip projection. Overprojection may result from anatomical factors or occur iatrogenically during primary rhinoplasty. Achieving reliable, reproducible, and stable results is the aim of nasal tip deprojection rhinoplasty. The authors' technique is designed to decrease nasal tip deprojection in patients with an overly projected nasal tip.

Methods: A retrospective chart review of 2003 rhinoplasty cases in the senior author's (R.G.R.) practice was conducted for the period between July of 2014 and June of 2022. The inclusion criteria were cosmetic or functional rhinoplasty cases with nasal tip deprojection, with a minimum of 12 months of follow-up. Outcomes of interest included the rate of operative revisions and the rate of postoperative infection.

Results: A total of 447 patients met the inclusion criteria. The mean age of our study group was 32.1 years, with 409 female patients, and 291 cases were primary rhinoplasties. The mean follow-up period was 22.4 months. Eight patients (1.8%) required empiric antibiotics postoperatively, and 17 patients (3.8%) required operative revision.

Conclusions: The authors' case series demonstrates that combining resection of the medial crura with lateral crural steal and a columellar strut graft allows the surgeon to achieve considerable nasal tip deprojection. The comprehensive patient follow-up (mean, 22.4 months) further supports the reliability of the authors' technique. *(Plast. Reconstr. Surg.* 155: 439, 2025.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

Rhinoplasty is one of the most common facial procedures performed by board-certified plastic surgeons in the United States.[1] Rhinoplasty may involve modifying the projection of the nasal tip, as this may help to achieve a more balanced and proportionate overall nasal aesthetic. To begin to address tip overprojection, the interaction between nasal tip support components and how they contribute to projection must be understood.

Achieving an appropriately projecting nasal tip is a vital component for success in rhinoplasty and is predicated on a fundamental understanding of the anatomical components that provide nasal tip support and their influences on tip projection and shape. Nasal tip projection can be defined as the distance from the alar crease junction to the nasal tip lobule. The anatomical components of nasal tip support include (1) the size and shape of the paired lower lateral cartilage (LLC); (2) intercartilaginous and scroll ligaments between the upper lateral cartilages and LLCs; (3) connections between the medial crura of the LLC and the caudal septum; and (4) the attachment of the lateral crura to the piriform.[1–3] Minor tip support mechanisms include interdomal soft-tissue connections, soft-tissue sesamoid complexes, the cartilaginous dorsal septum, and the nasal spine.[1,2] Overprojection of the nasal tip can be caused by several factors, including overdeveloped medial

From the [1]Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, University of Toronto; [2]Department of Plastic Surgery, Manhattan Eye, Ear, and Throat Hospital; [3]New York Plastic Surgical Group; and [4]Department of General Surgery, New York University Langone Health.

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and/or lateral crura, overprojected anterior septal angle, or a hyperplastic anterior nasal spine. It is important to distinguish these conditions from those that cause an illusion of overprojection, such as a deep nasofrontal angle, dorsal saddling, a posteriorly displaced chin, or a short upper lip, as these require a different surgical approach.[3,4]

The complexity of the nasal tip apparatus has spurred various techniques for nasal tip deprojection. In the tripod framework, the medial crura compose the central leg and the lateral crura form the two adjacent side legs. Modification of any of the legs of the tripod even by 2 to 3 mm translate into significant changes of the nasal tip projection. Commonly used techniques can be broadly categorized into steal, overlay, and other. In steal techniques, the lateral or medial crura of the LLC are recruited to laterally or medially reposition the domes. In overlay techniques, the lateral or medial crura of the LLC are elevated from the underlying mucosa, then transected and sutured back in a shortened accordion-like manner.[5–7] Other techniques include lateral crural tensioning and repositioning techniques. In performing nasal tip deprojection techniques, the integrity of the various tip support structures is disrupted. Thus, rebuilding support to maintain the newly designed cartilage contour and tip position is another key component of nasal tip deprojection in rhinoplasty. Various methods for tip stabilization have been described, including caudal extension grafts, columellar strut grafts, extended spreader grafts, and tongue-in-groove suturing.[2,8,9] Armed with the vast permutations of nasal tip deprojection techniques and tip stabilization methods, the ultimate goal of nasal tip deprojection rhinoplasty remains to find a combination of techniques that it is effective and stable in the long term.

In recent years, the senior author (R.G.R.) has successfully addressed the overprojected nasal tip of many patients with a series of maneuvers to achieve an aesthetically pleasing nasal tip deprojection while maintaining the strength of the tip complex. This article describes the surgical technique and results of that procedure.

PATIENTS AND METHODS

A retrospective single-surgeon chart review was conducted of the senior author's (R.G.R) practice from July of 2014 to June of 2022. The review included all patients who underwent rhinoplasty during that period. The study was approved by the Biomedical Research Alliance of New York institutional review board.

Inclusion criteria consisted of patients who underwent aesthetic or functional open rhinoplasty with nasal tip deprojection. Both primary and revision rhinoplasty patients were included, with a minimum of 12 months of follow-up required for inclusion. Manual chart review was conducted to collect patient demographics and surgical outcomes. Outcomes of interest included any operative revisions and the rate of postoperative infection, which was defined as erythema requiring antibiotic use after completing the routinely prescribed prophylactic antibiotics given postoperatively. The routine postoperative antibiotic prophylaxis includes a 7-day course of either cefadroxil or clindamycin, with the latter prescribed if there is penicillin allergy.

Operative Technique

The senior surgeon exclusively uses an open approach to rhinoplasty, and all cases are performed under general anesthesia. Stair-step–columellar and bilateral infracartilaginous incisions are made, exposing the soft tissue and bony nasal vault. After addressing other components of the rhinoplasty, we turn our attention to nasal tip deprojection. Using a No. 15 blade and a cutting block, we fashion columellar strut grafts along with any other cartilage grafts required for the rhinoplasty. We ensure that the columellar strut is 4 mm wide, 2 mm thick, and at least 15 mm long, although the length is often trimmed according to the patient's anatomy. The medial crural footplates are carefully dissected, minimizing disruption of their attachments to surrounding tissues, and a columellar strut graft is placed. The medial crural footplates are secured to the caudal portion of the columellar strut using 5-0 clear nylon suture. The medial crura are then transected above where the footplates have been secured and the LLC is then dissected free of the mucosa from the medial crus to the middle crus with careful attention paid to releasing the subdomal area in particular. With most of the LLC mobilized, an excision of the medial crus is performed, the length of which is typically in the 4- to 16-mm range but is ultimately determined by each patient's anatomy. To avoid overexcision, it is important to perform this maneuver conservatively, judge the amount of deprojection that has been achieved, and gradually resect more of the medial crus if necessary. When considering the amount of LLC to resect, the senior author considers both the aesthetic impact of the deprojection and the redundancy of the LLC and associated lack of tip support. Furthermore, the author

uses the cephalic margin of the columellar strut as a target for the final tip height. A lateral steal maneuver is then performed to approximate the cephalic segment of medial crura to the remaining medial crural footplates. These are secured to the medial crural footplates and the columellar strut graft with horizontal mattress sutures using 5-0 clear nylon sutures. In some cases, there may be a width discrepancy between the 2 ends of a medial crus; when this occurs, it is addressed by reapproximating the ends such that the wider end does not protrude caudally. With the medial crura repaired, the domes are assessed and recreated with cephalic transdomal and interdomal sutures such that they are flush with the tip of the columellar strut. We do not perform a horizontal mattress transdomal suture, as we believe it is more likely to create a pinched tip. The lateral crura do not require stabilization, as they are not disinserted laterally and thus the tension placed on them by the maneuver appropriately maintains their position. Once we are satisfied, the skin and mucosa are assessed to determine whether redundancy has been created by the deprojection maneuver—this is not common, but it is possible in patients requiring large deprojections. (**See Video [online]**, which shows the operative technique: [1] medial crural footplate skeletonization and transection; [2] lateral crural steal and suturing of medial crural footplate to columellar strut graft and lateral crural footplates; and [3] removal of excess skin from columella. This patient example represents an extreme case of medial crura excision, and we recommend gradual resection of the medial crura as needed for tip deprojection.)

RESULTS

A review of 2003 cases of rhinoplasty performed during the study period yielded 447 patients who underwent either primary rhinoplasty (65.2%) or revision rhinoplasty (34.8%) with nasal tip deprojection. Most participants were female patients (91.5%), with a mean age of 32.1 years (range, 15 to 89 years). The mean follow-up period was 22.4 months, and the minimum follow-up was 12 months. A summary of demographic data is provided in Table 1. A representative example of a patient who underwent nasal tip deprojection surgery is demonstrated in Figures 1 and 2. (**See Figure, Supplemental Digital Content 1**, which shows a woman in her 20s preoperatively [*left*] and 1 year postoperatively [*right*]. This patient had a dorsal hump, an overprojecting nasal tip, deviated septum, and a drooping tip. The senior author performed tip elevation, dorsal hump reduction, tip refinement, septal reset, and tip deprojection, ***http://links.lww.com/PRS/H423***.)

Table 1. Patient Demographics and Complication Rates

Characteristic	Value (%)
Sex	
Female	409 (91.5)
Male	38 (8.5)
Age, yr	
Mean	32.1
Range	14–89
Follow-up, mo	
Mean	22.4
Range	12–82
Rhinoplasty	
Primary	291 (65.2)
Revision	156 (34.8)
Complications	
Infection	8 (1.8)
Revision surgery	
Any	17 (3.8)
Requiring further nasal tip deprojection	3 (0.7)
Requiring increased nasal tip projection	4 (0.9)

DISCUSSION

The present study provides an assessment of the complications of our technique for nasal tip deprojection with a minimum of 12 months of follow-up. We provide a reliable and reproducible technique for addressing an overprojected tip and providing tip support to create a stable, aesthetic, and functional nose.

The senior author's primary practice centers around rhinoplasty, predominantly involving patients who are seeking revision rhinoplasty, which represents approximately 5% to 15% of all rhinoplasty patients.[10,11] For patient's undergoing multiple revision rhinoplasties, there is often poor tip support.[11,12] The senior author addresses this lack of tip support by creating a sturdy base with a columellar strut graft, and more importantly, with the tip deprojection maneuver itself, as described above. In our opinion, by excising a portion of the LLCs and performing a lateral steal, the arc of each of the LLCs is shortened, which creates a lower and more stable tip construct. In unison, the columellar strut graft; medial crura and, possibly, middle crura resection; and lateral steal maneuver lead to a functionally strengthened nasal tip complex.

When compared with other common techniques for nasal tip deprojection, such as overlay

Fig. 1. A woman in her 20s is shown preoperatively. This patient had previous rhinoplasty that left her with an overprojected tip, tip asymmetry, extreme nostril asymmetry, an exaggerated supratip break, and a foreshortened overrotated nasal tip with overexposure of her nostrils.

techniques, there is a higher risk of columella widening with medial overlap of either of the middle or medial crura of the lower lateral cartilage.[12–17] With the tongue-in-groove setback technique, there is a higher risk for overrotating the tip cephalically. Neither of these techniques provides the same medial structural stability that is afforded by the columellar strut graft, as seen in our technique.[13,18] The nasal tip deprojection technique that is most similar to ours is described by Cochran and Afrooz, in which a columellar strut graft is used with transdomal horizontal mattress sutures to recreate a deprojected tip and suturing of the medial crura to fortify the final position.[19] Although this technique involves many of the same components, the order in which the components are executed in our technique is different, and some key differences remain. In their approach to tip deprojection, Cochran and Afrooz secure the medial footplates and then create new domes using horizontal mattress transdomal sutures. The new domes are advanced medially and secured to a columellar strut, creating redundancy in the medial crus. The redundancy is where the medial crus is transected, and sometimes then overlapped or resected. In the technique we have described, the medial crus is transected earlier in the process, and the entire lower lateral cartilage can be advanced medially until the desired projection is achieved; then, we choose where to recreate the domes. We also always resect the medial crura instead to avoid widening of the columella, and we avoid horizontal mattress transdomal sutures to minimize risk of a pinched tip.

The postoperative infection rate in our study was 1.8%, which is similar to what has

Fig. 2. The same patient as shown in Figure 1 at 1 year postoperatively. The senior author performed the following: revision rhinoplasty with nasal bone osteotomies; dorsal hump reduction; tip deprojection; mastoid fascia tip graft to unify her tip; and placement of a columellar strut graft, extended spreader graft, and alar contour grafts using fresh frozen cadaveric cartilage to add tip support, allow tip refinement, and improve her breathing.

been reported in the literature.[10,11,20] All cases resolved with empiric antibiotic treatment, with 0 patients requiring operative management acutely for infection. The rate of infection was notably higher in the revision rhinoplasty cases, with 6 of 8 total patients requiring empiric antibiotics having undergone previous rhinoplasty surgery. One of these patients did require further revision rhinoplasty 3 months after initial symptoms of infection, because of scarring and adhesions.

Rates of operative revision were found to be comparable to the literature, with 3.8% of patients requiring further revision surgery.[10,11] Interestingly, there were only 7 patients (1.6%) postoperatively with complaints related to underprojection or overprojection of the tip, with 3 patients (0.7%) requiring further deprojection surgery. As the nasal tip commonly exhibits the slowest resolution of edema in rhinoplasty, requiring approximately 1 year for primary procedures, with a minimum of 12-months follow up, we can appropriately evaluate the outcomes of our deprojection technique on nasal tip aesthetics. Despite this, we acknowledge that patients continue to heal at the 12-month mark, and the revision rate at this time may not reflect the long-term revision rate. Furthermore, our study assessed tip deprojection with only qualitative assessment. Thus, we aim to use quantitative metrics to assess tip deprojection and assess this over a longer period of follow-up in future studies. We further acknowledge that the present study faces the limitations that all retrospective studies face such that the present revision rate may underestimate the true revision rate, as patients who went for revisions at other practices after the study period without our knowledge are not accounted for.

CONCLUSIONS

The present technique facilitates a substantial nasal tip. We have found the results to be reliable over the period studied. Finally, the complication rates presented are in keeping with those reported within the current body of literature. Therefore, this technique can be considered in patients for whom nasal tip projection is a primary concern during rhinoplasty.

Richard G. Reish, MD
New York Plastic Surgical Group
1040 Park Avenue, Suite 1BC
New York, NY 10028
rreish@lipsg.com
Instagram: dr.richard.reish

DISCLOSURE

The authors have no financial disclosures or conflicts of interest to declare in relation to the content of this article.

PATIENT CONSENT

Patients provided written informed consent for the use of their images.

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