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Short Communication

Enhancing nasal tip projection and stability with a columellar strut graft placed in a mucosal flap pocket

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ABSTRACT

Objectives: Establishing a stable nasal tip is crucial for both aesthetic and functional outcomes in rhinoplasty. This study aims to present a novel technique used during columellar strut graft placement to enhance tip projection and ensure the stability of the reconstructed nasal tip.
Methods: This technique was applied to 22 rhinoplasty patients aged 18 to 52, including 20 primary and two revision cases. The procedure was performed as follows: During tip formation, the mucosal base at the anterior portion of the nasal spine was elevated with a posteriorly based flap while preserving the medial crura connections. This mucosa-crura complex was suspended and sutured to the caudal septum for stabilization and slight projection. A columellar strut graft was placed into a pocket created at the anterior base of the elevated flap to achieve the desired projection, and the tip complex was then reassembled.
Results: The columellar strut grafts supported by the mucosal flap were harvested from the septum in 19 patients and from costal cartilage in three patients. The follow-up period ranged from 12 to 24 months. No significant complications were observed in any patient. None required revision due to projection loss, and satisfactory outcomes were achieved.

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Conclusions: Tip projection and rotation can be better and more reliably controlled with a columellar strut graft supported by a posteriorly based mucosal flap. This easily applicable technique reduces the long-term risk of projection loss associated with conventional columellar strut graft placement. Additionally, it eliminates the need for an extra cartilage graft between the columellar strut and the caudal septum to enhance stability.

Introduction

In rhinoplasty, the nasal tip plays a pivotal role in defining both aesthetic and functional outcomes. Achieving long-lasting projection and precise rotation of the nasal tip remains one of the most technically demanding aspects of nasal surgery. Among the most commonly employed techniques are the columellar strut graft (CSG) and the septal extension graft (SEG). The SEG, while effective in providing robust structural support and maintaining long-term projection, often leads to excessive rigidity. This stiffness can compromise natural nasal dynamics and negatively affect patient satisfaction due to decreased nasal tip mobility.[1,2] In contrast, CSG provides a more flexible and natural result but may fall short in long-term structural reliability, especially in patients requiring substantial projection or those with weak lower lateral cartilage support.[3]

This paper presents a novel modification to the traditional CSG technique that utilizes a posteriorly based mucosal flap. By elevating a mucosal flap from the anterior nasal base and creating a pocket for the graft, this method aims to reinforce the strut, enhance projection, and reduce the likelihood of postoperative instability. The technique combines the simplicity and soft-tissue preservation of the CSG with added stability, potentially offering a balance between mobility and long-term support.[4]

Methods

This novel technique was applied to 22 patients who underwent open rhinoplasty between 2021 and 2024. The cohort included 15 women and seven men, aged between 18 and 52 years. Twenty were primary cases, while two were revision surgeries. All procedures were performed under general anesthesia.

A standard open rhinoplasty approach was employed with transcolumellar and infracartilaginous incisions. Soft tissue elevation was carried out in the supraperichondrial and subperiosteal planes. Where required, hump reduction, septoplasty, and osteotomies were performed. A stable L-strut was preserved in all cases to ensure midvault support.

The key innovation of the technique lies in the tip-plasty stage. The anterior portion of the caudal septum extending beyond the nasal spine was vertically excised. A posteriorly based mucosal flap was carefully dissected from the nasal base, preserving the medial crural attachments to maintain continuity. This mucosa–crura complex was then suspended and sutured to the caudal septum to create both structural support and a slight forward tension.

A columellar strut graft, carved from septal cartilage in 19 cases and costal cartilage in 3, was then inserted into a pocket formed at the anterior base of the elevated flap. The medial CRURA were anchored to the strut, allowing for accurate control of projection and rotation. The tip complex was reassembled using standard suture techniques.

Figure 1. Lateral postoperative view of a patient who underwent the technique.

Results

The patients were followed up for an average duration of 18 months (range: 12 to 24 months). No intraoperative complications were reported. Postoperative evaluation included both clinical examination and standardized photographic analysis. None of the patients experienced significant loss of projection or rotation during the follow-up period.

The stability of the nasal tip was preserved in all cases, with no revisions required for projection loss. Patients demonstrated consistent improvements in nasolabial angle and columellar show, with preservation of natural nasal tip mobility. Satisfaction scores, as assessed via a 5-point Likert scale, were high across the cohort. No adverse events, such as infection, mucosal necrosis, or graft displacement, were recorded Figs. 1 and 2.

Discussion

Traditional floating CSGs provide only limited support, with tip projection gains usually not exceeding 1–2 mm and high rates of long-term derotation.[5] SEGs offer stronger support but risk creating stiff, unnatural nasal tips.[3] The technique presented here provides a middle ground, using a mucosal flap to stabilize the strut graft while preserving flexibility. By anchoring the CRURA and flap to the

Figure 2. Basal views after surgery for another patient who underwent the technique.

caudal septum and creating a supportive pocket, this method controls projection and rotation more effectively.[4]

Unlike SEGs, this technique avoids overcorrection and eliminates the need for additional cartilage grafts. Furthermore, it offers a structurally stable yet elastic tip complex. The mucosal flap, normally disregarded in traditional approaches, is repurposed here as a biomechanical sling, enhancing graft stability without increasing surgical morbidity.[5]

By minimizing the need for premaxillary or splinting grafts, the method simplifies operative steps and limits donor site trauma. Importantly, it preserves natural mobility, which is often lost with overly rigid approaches. This advantage is especially valuable in patients prioritizing both function and a natural aesthetic result.

The membranous tongue-in-groove (TIG) maneuver involves suturing the medial crura to the caudal septum through the membranous septum. Since the medial crura are fixed to the caudal septum, this maneuver restricts postoperative nasal tip mobility, for example during nose wiping. Additionally, it tends to shorten the nasal length. Our technique, in contrast, can be applied without shortening nasal length, and the creation of a submucosal pocket in our method allows more effective enhancement of tip projection.

The Teo-strut is a single-piece triangular septal monopod graft fixed to the septum at approximately an 80° angle. It provides combined tip projection and rotation with relatively long-term sta-

bility, as the nasal tip region is once again anchored to the septum with a graft. In our technique, the projection and rotation of the nasal tip are supported by a columellar strut graft reinforced with a posteriorly based mucosal flap**,** and no septal support for the graft is required**.** In this respect, our technique represents an alternative approach to the Teo strut, as the graft is stabilized without septal fixation.

A potential limitation of our technique is that, in patients with thick skin, it may be insufficient as a standalone approach. In thick-skinned patients, we combine our technique with additional maneuvers**,** such as: Cap graft placement at the tip, Soft-tissue thinning procedures, Supratip suture techniques.

The patients were followed up for an average duration of 18 months (range: 12 to 24 months). Although an 18-month follow-up may seem short, we believe it is sufficient to introduce our technique and present early outcomes**.** We will be pleased to report our long-term results in future publications.

Conclusion

This mucosal flap-assisted columellar strut graft technique represents a refined, anatomically informed advancement in nasal tip support. It enhances projection and stability while preserving natural mobility and minimizing surgical complexity. The method is safe, reproducible, and well-suited for both primary and selected revision rhinoplasty cases. Based on encouraging short- to mid-term outcomes, this approach may serve as a reliable alternative to septal extension grafts, particularly in patients who require a natural and dynamic nasal tip profile.

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

Consent to Publish

The participants provided informed consent regarding publishing their data and photographs.

Ethics Approval

Our study was conducted at Haseki Training and Research Hospital, Department of Otorhinolaryngology Head and Neck Surgery, and adhered to the principles of the Declaration of Helsinki and Good Clinical Practices Guide. Ethical approval was obtained from the Haseki Training and Research Hospital Clinical Research Committee (reference number 89-2023).

Declaration of Competing Interest

The authors declare that they have no known competing financial or nonfinancial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi: 10.1016/j.jpra.2025.08.028.

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