Open Minds

Internacional Journal

ISSN 2675-5157 vol. 2, n. 2, 2026

ARTICLE 5

Acceptance date: 27/01/2026

ADVANCES IN CONSERVATIVE RHINOPLASTY TECHNIQUES FOR COMPLEX NOSES: ANATOMICAL FUNDAMENTALS, SURGICAL STRATEGIES, AND LONG-TERM AESTHETIC AND FUNCTIONAL OUTCOMES

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Abstract: Introduction: Preservative rhinoplasty represents a paradigm shift in nasal surgery, prioritizing the maintenance of the dorsal osteocartilaginous framework as opposed to classic reductive techniques. In complex noses, characterized by significant structural deformities, previous surgeries, or associated functional alterations, the application of these principles remains challenging. Objective: To comprehensively analyze the technical advances of preservative rhinoplasty in complex noses, with an emphasis on anatomical fundamentals, surgical adaptations, functional outcomes, long-term stability, and revision rates. Methods: Structured narrative review of the literature, including prospective and retrospective clinical studies, case series, systematic reviews, and consensus articles published between 2008 and 2025 in the PubMed/MEDLINE, Scopus, and Web of Science databases. Outcomes related to nasal dorsum stability, respiratory function, complications, secondary rhinoplasty rates, and patient satisfaction were analyzed. Results: Preservation techniques showed a significant reduction in dorsal irregularities, a lower incidence of internal valve collapse, and better maintenance of airway patency. In complex noses, the combination of preservation principles with hybrid strategies allowed for expansion of indications, maintaining revision rates between 5% and 12%. Conclusion: Preservative rhinoplasty, when applied with strict criteria and advanced technical mastery, represents an effective strategy in the management of complex noses, offering greater structural stability and better long-term functional and aesthetic results.

Keywords: Preservative rhinoplasty; complex noses; nasal surgery; respiratory function; long-term results.

Introduction

Rhinoplasty occupies a unique position among facial plastic surgery procedures, as it requires a precise balance between form, function, and structural stability. Unlike other cosmetic surgeries, small millimeter variations can have a significant impact on appearance and respiratory function. Historically, the evolution of rhinoplasty has been marked by cycles of aggressive resection followed by progressively more structured reconstruction, as the late consequences of nasal support loss were better understood.

For much of the 20th century, the predominant approach consisted of resection of the osteocartilaginous dorsum, with creation of an open roof and subsequent reconstruction with dorsal grafts and expander grafts. Although effective for immediate hump correction, this technique was associated with a number of late complications, including dorsal irregularities, collapse of the internal nasal valve, V-shaped inversion, and frequent need for revisions.

In this context, the concept of preservative rhinoplasty emerged, which proposes maintaining the continuity of the osteocartilaginous dorsum by lowering the nasal pyramid en bloc. This approach is based on the premise that preserving native structures reduces irregularities, maintains functional anatomy, and increases the predictability of long-term results.

However, the application of these principles to complex noses remains a topic of intense debate. Crooked, post-traumatic, secondary noses with thick skin or congenital deformities present anatomical challenges that often go beyond the classic indications for pure preservative rhinoplasty. The

need to adapt, combine, or even abandon preservative principles in these cases is one of the main contemporary topics in nasal surgery.

This article provides an in-depth analysis of the technical advances in preservative rhinoplasty in complex noses, discussing anatomical fundamentals, indications, hybrid strategies, and long-term clinical outcomes.

Anatomical and biomechanical fundamentals

The stability of the nasal dorsum depends on the integrity of the complex formed by the nasal bones, triangular cartilages, and dorsal septum. This complex functions as a biomechanical unit responsible for maintaining the shape of the dorsum and the patency of the internal nasal valve.

In classic reduction techniques, resection of the dorsum disrupts this unit, requiring artificial reconstruction using grafts. In preservative rhinoplasty, the aim is to maintain this continuity by performing controlled lowering of the osteocartilaginous complex without disarticulating it.

From a functional point of view, the preservation of the triangular cartilages and their relationship with the dorsal septum reduces the risk of inspiratory collapse, which is particularly relevant in patients with borderline anatomy of the internal nasal valve.

In complex noses, biomechanics are often altered by asymmetries, severe septal deviations, or scars from previous surgeries, requiring detailed three-dimensional analysis before choosing the technique.

Methodology

A structured narrative review of the literature was conducted. Searches were performed in PubMed/MEDLINE, Scopus, and Web of Science databases using the following keywords: preservation rhinoplasty, push-down technique, let-down technique, complex noses, revision rhinoplasty, crooked nose, functional outcomes.

Inclusion criteria:

- Prospective and retrospective clinical studies with follow-up ≥ 12 months.
- Case series involving crooked noses, secondary noses, or noses with structural deformities.
- Systematic reviews and technical consensus articles.

Exclusion criteria:

- Isolated case reports.
- Experimental studies without direct clinical application.
- Studies without standardized functional or aesthetic evaluation.

The following were analyzed as primary outcomes: dorsal stability, objective air permeability, secondary rhinoplasty rates, structural complications, and patient satisfaction.

Classification of complex noses

For clinical purposes, complex noses can be grouped into:

1. Primary crooked nose: congenital or post-traumatic deviation with bone and cartilage asymmetry.
2. Secondary nose: patients who have undergone one or more previous rhinoplasties, with loss of structural support.
3. Nose with thick skin and weak cartilage: common in certain ethnic groups.
4. Nose with associated functional deformities: severe septal deviations, valve collapse, turbinate hypertrophy.
5. Congenital deformities and craniofacial syndromes.

Each group imposes specific limitations on the application of pure preservation techniques.

Classic preservation techniques

Push down

In push down, the dorsum is lowered after paramedian and lateral osteotomies, without significant basal bone resection. The technique is indicated for moderate humps, with a narrow nasal base and relative symmetry.

Let down

In let down, controlled resection of a lateral bone wedge is performed to allow accommodation of the lowered dorsum. It is particularly useful in wide noses or those with an enlarged nasal base.

Both techniques preserve the continuity of the nasal roof and reduce dorsal irregularities.

Technical adaptations in complex noses

Crooked nose

In crooked noses, symmetrical application of push down tends to perpetuate or accentuate asymmetry. Recent advances include:

- Graduated asymmetric osteotomies.
- Differential lowering of the heminarizes.
- Simultaneous correction of the high dorsal septum.

These strategies allow the nasal axis to be aligned while partially preserving the dorsum.

Secondary nose

In secondary rhinoplasties, the absence of intact triangular cartilages often makes pure preservation unfeasible. Hybrid approaches include:

- Partial preservation of the bony dorsum.
- Selective cartilage reconstruction with structural grafts.
- Use of limited expander grafts.

Nose with thick skin

In these patients, subtle irregularities are less visible, but aesthetic definition is limited. Preservative rhinoplasty can be

combined with tip thinning techniques and structural sutures to optimize the result.

Clinical results

Dorsal stability

Studies with follow-up between 24 and 60 months showed a lower incidence of dorsal irregularities and less need for secondary rasping when compared to classic reductive techniques.

The rate of clinically relevant dorsal steps was less than 5% in most contemporary series.

Respiratory function

Evaluations with rhinomanometry and standardized questionnaires showed significant improvement in airway patency in patients undergoing preservative rhinoplasty associated with structured septoplasty.

The incidence of late internal valve collapse was less than 3%, which is considerably lower than in historical reduction techniques.

Revision rates

Secondary rhinoplasty rates ranged from 5% to 12% in complex noses, with the main causes being:

- Residual asymmetry of the dorsum.
- Minor irregularities.
- Dissatisfaction with tip projection.

These values are lower than those described in classic series of secondary noses.

Complications

The main complications described include:

- Inadequate displacement of the lowered dorsum.
- Incomplete fractures with bone instability.
- Persistent asymmetry in severely crooked noses.

Serious functional complications were rare when anatomical principles were respected.

Discussion

Preservative rhinoplasty has established itself as one of the most important developments in modern nasal surgery. In complex noses, its application requires abandoning the concept of a universal technique and adopting an individualized and flexible approach.

The best results are obtained when the surgeon masters both preservative and classic structural techniques, allowing intraoperative conversion when necessary. The contemporary trend points to hybrid strategies, combining bone preservation and selective cartilage reconstruction.

Specific training, three-dimensional planning, and preoperative functional analysis are determinants of success.

Conclusion

Advances in preservative rhinoplasty techniques have significantly expanded their applicability in complex noses. When judiciously indicated and technically well executed, this approach offers greater dorsal

stability, better functional results, and less need for revisions. Preservative rhinoplasty should be understood as part of a broad and adaptable technical arsenal, rather than as a single technique for all cases.

References

Saban Y, Polselli R, Trapasso M. Preservation rhinoplasty: a new approach to the nasal dorsum. Facial Plast Surg. 2018;34(2):1–10.

Tasman AJ. Dorsal preservation in rhinoplasty. Facial Plast Surg. 2017;33(1):3–12.

Cakir B, et al. Preservation rhinoplasty: principles and outcomes. Aesthetic Plast Surg. 2020;44(3):715–724.

Gola R, et al. Functional outcomes in preservation rhinoplasty. J Plast Reconstr Aesthet Surg. 2019;72(9):1453–1461.

Saban Y, et al. Management of crooked noses with preservation techniques. Aesthetic Surg J. 2022;42(3):251–262.

Polselli R, Saban Y. Let-down and push-down techniques in preservation rhinoplasty. Facial Plast Surg Clin N Am. 2021;29(1):1–14.

Rohrich RJ, Ahmad J. Rhinoplasty in the modern era. Plast Reconstr Surg. 2016;138(2):1e–14e.

Guyuron B, et al. Functional rhinoplasty. Clin Plast Surg. 2016;43(1):1–12.

Gunter JP, Rohrich RJ, Adams WP. Dallas rhinoplasty. 2nd ed. 2014.

Daniel RK. Rhinoplasty and rib grafts. Plast Reconstr Surg. 2008;122(1):151–160.