# Combining Preservation and Structural Rhinoplasty

Rahul K. Sharma, MD[a], Sam P. Most, MD[b], Priyesh N. Patel, MD[a,*]

**KEYWORDS**

• Structural preservation rhinoplasty • Dorsal preservation • Dorsal hump

**KEY POINTS**

- Structural preservation rhinoplasty (SPR) incorporates the benefits of preservation and structural rhinoplasty and has several variations.
- Dorsal preservation can be effectively coupled with structural lower-third and nasal tip modifications.
- A preservation lens should be used when applying structural methods.
- A nasal dorsal convexity can be converted to a preservation candidate using structural techniques (eg, osteoplasty or grafting).
- Modified dorsal preservation techniques use partial preservation of either the midvault or nasal bone-upper lateral cartilage junction and incorporate structural methods.

## INTRODUCTION

Preservation rhinoplasty (PR), in contrast to structure rhinoplasty (SR), aims to preserve rather than violate key endogenous attributes of the nose including cartilage, soft tissue, and ligaments.[1] Dorsal preservation (DPR) specifically refers to the en bloc lowering of the dorsum with conservation of the nasal keystone, with or without modification of the bony cap.[2] Several studies have shown good patient satisfaction with dorsal preservation methods, as well as low rates of revision surgery, residual or recurrent hump, postoperative nasal deviation, and postoperative infection.[3–6] In light of this, there has been a resurgence in the implementation of preservation techniques in rhinoplasty. However, there are scenarios in which structural rhinoplasty may be better indicated for treatment of the dorsum and/or nasal tip.

In some DPR cases, modulation of certain aspects of the nose with structural techniques may better achieve desirable contours and outcomes. This philosophy has become known as structural preservation rhinoplasty (SPR), in which structural methods and dorsal preservation are used in the same patient.[2,7] In previous descriptions of this approach, the nasal dorsum and midvault are managed via preservation techniques, while the lower third of the nose/nasal tip is treated with primarily structural techniques.[7–11] The fusion of techniques allows for greater versatility and gives surgeons familiar with structural techniques the ability to incorporate certain preservation principles, primarily DPR, into practice. This article reviews the philosophy, indications, and techniques associated with SPR.

## GENERAL CONCEPTS IN STRUCTURAL PRESERVATION RHINOPLASTY

Although structural rhinoplasty is the more ubiquitous rhinoplasty approach at this time, the use of preservation techniques is becoming more pervasive.[12] Despite its equally long history, few

[a] Division of Facial Plastic and Reconstructive Surgery, Department of Otolaryngology–Head and Neck Surgery, Vanderbilt University Medical Center, Nashville, TN, USA; [b] Division of Facial Plastic and Reconstructive Surgery, Department of Otolaryngology-Head & Neck Surgery, Stanford University School of Medicine, Stanford, CA, USA
* Corresponding author.
*E-mail address:* priyesh.patel.1@vumc.org

Facial Plast Surg Clin N Am 33 (2025) 229–240
https://doi.org/10.1016/j.fsc.2025.01.002

**Abbreviations**

| | |
|---|---|
| DOHM | dorsal osseocartilaginous horizontal mattress |
| DPR | dorsal preservation rhinoplasty |
| DSG | dorsal septal gap |
| LD | let-down |
| MSSM | modified subdorsal strip method |
| PD | push-down |
| PR | preservation rhinoplasty |
| SMAS | sub-superficial musculoaponeurotic system |
| SPR | structural preservation rhinoplasty |
| SR | structure rhinoplasty |
| ULC | upper lateral cartilage |

rhinoplasty surgeons actively incorporate dorsal preservation into their practices.[12] In recent years, with an increase in education and exposure surrounding preservation, there has been a growing appreciation for this methodology and its associated benefits. The fusion of preservation and structural rhinoplasty reflects an important technical advancement in nasal surgery, as it acknowledges the benefits of each approach and allows for increased versatility.

Fundamentally, preservation surgery endorses 3 major concepts. As aforementioned, DPR minimizes violation of the keystone and the attachments of the upper lateral cartilages (ULCs) to surrounding structures. As such, the bony and cartilaginous vaults are treated as 1 unit, and there is no need for midvault reconstruction. Secondly, sub-perichondrial dissection is favored; soft tissue and nasal ligaments are preserved where possible and resutured if violated. Finally, the alar cartilage is minimally disturbed, with preferences for suture techniques over excisional methods. In its purest form then, a preservation approach to rhinoplasty favors a closed approach. Although benefits of closed rhinoplasty can be theorized, there are significant benefits of open work. Moreso, many surgeons have elected to avoid or abandon preservation techniques, primarily because of poor results, less predictability, and complications (largely hump recurrence).[12] The fusion of structural and preservation may alleviate some of these concerns.

Although more recent descriptions of this hybrid approach have emphasized preservation techniques for the dorsum (DPR) with lower third structural techniques, the integration of structure and preservation is more common when considering contemporary rhinoplasty. The authors here suggest several general categories to describe this integration. Each of these components may be exercised independently at the discretion of the rhinoplasty surgeon.

1. DPR coupled with structural approaches to the lower third and the nasal tip
2. Approaching structural lower-third manipulations with a preservation lens, such that there is limited resection of lower lateral cartilages with an emphasis on suture techniques
3. In open nasal approaches, minimizing the degree of soft tissue disruption at the middle vault and dorsum when possible in structural and preservation cases
4. Converting a nasal dorsum to a preservation candidate through the use of structural techniques, including osteoplasty, excision, or grafting (eg, radix, spreaders)
5. Modified DPR techniques in which components of the nasal dorsum are treated with structural methodology or the ULCs are separated from the midline.

## DORSAL PRESERVATION WITH STRUCTURAL APPROACHES TO THE LOWER THIRD

In patients with pleasing dorsal aesthetics on frontal view, the use of preservation techniques has been shown to yield positive patient-reported outcomes.[1,13,14] Importantly, it should be noted that preservation techniques, based on current data, have not been shown to be superior to structural dorsal techniques.[13,15,16] These positive outcomes are likely a product of good patient selection and technical execution, and highlight the need to understand the indications for preservation candidates. In addition, patient-reported outcome measures can miss granular details that may be better appreciated by rhinoplasty surgeons. In the authors' experience, preservation methods for the dorsum yield an early favorable aesthetic and more predictable positive longer-term results. As such, there has been an emphasis on performing DPR when appropriate. However, preservation, particularly as it pertains to the dorsum, is not always feasible. An understanding of what scenarios will impart the greatest success using this ideology will prevent poor outcomes.

Preservation techniques are ideally performed in the setting of primary rhinoplasty.[11,17] In revision cases, there has been violation of the keystone, and there may be substantial structural deficiencies that are not amenable to preservation techniques. Patients with more kyphotic prominences, longer nasal bones (and analogously a shorter cartilaginous component to the dorsal hump), deep nasofrontal angles, wide or irregular nasal bones, and flared midvaults are less ideal candidates for DPR surgery, although these are not necessary absolute exclusion criteria.[1] If the dorsum is not deemed to be of ideal shape or if

the patient is unsatisfied with it on frontal view preoperatively, preservation surgery is less appropriate. As will be discussed later, there are methods to convert some of this anatomy to a state more favorable for preservation.

In SPR, the nose is widely decorticated in a supra-perichondrial subfascial plane. This transitions to a subperiosteal plane at the level of the nasal bones and affords wide exposure of the nasal tip, midvault, and bony pyramid. The requisites for dorsal lowering in an SPR approach include septal resection (cartilage ± bone) and separation of the osseous nasal pyramid from the surrounding bone. The latter may come in the form a push-down (PD) maneuver (lateral and root osteotomies with displacement of the bony vault into the nasal cavity medial to the maxilla) or a let-down (LD) maneuver (additional wedge resections at the nasal bones with the bony vault resting on the maxilla).[17–22] The former has several variations categorized by location of septal excision (immediate subdorsal, subdorsal/intermediate, or low).[1,11,18–20,23–38] These techniques have been previously described and are not outlined in detail here. With subdorsal methods, cartilage that remains immediately below the dorsum can be more easily anchored to more inferior cartilage. In techniques where the caudal strut of cartilage is not violated (eg, in the modified subdorsal strip method [MSSM] or tetris method), the caudal septum can be utilized for tip stabilization.[11,28] The MSSM method has been favored by the authors, although other methods have been shown to have equally good results. In this method, a 5 to 7 mm subdorsal strut is preserved, as is a 1 to 1.5 cm caudal strut. The caudal septum can either be trimmed secondarily or left in its original location to allow for attachment of the tripod complex.

Manipulation of the dorsum via preservation methods is done before manipulation of the nasal tip. The nasal septum is also secured before finalizing changes to the lower third of the nose. Subsequently, additional maneuvers can be done to the caudal septum to either strengthen the caudal septal complex or extend it. In Cottle or SPAR techniques of managing the septum, the entire anterior septum can be repositioned to a newly desired position.[39] However, repositioning and stabilizing the septum to the maxillary crest may be deemed a challenge. Nonetheless, this method can be powerful for anterior septal deformities. Grafts can be sutured to caudal portions of cartilage with most septal techniques. In the MSSM and tetris methods, grafts can be obtained from cartilage inferiorly, because this area has not been violated. In these methods, the preservation of a stable caudal septal segment also allows for the attachment of septal extension grafting (**Fig. 1**). This is sutured anterior to the fusion site of ULC to the dorsal septum (W point). This grafting may impart additional stability to the septum, but also provides a more projected or rotated/counter-rotated position to anchor the nasal tripod.[40] Notably, DPR techniques can place substantial downward force and torque on the caudal septum, causing unwanted deviation, and this should be carefully inspected. In some scenarios, the tripod can be sutured to the remaining caudal

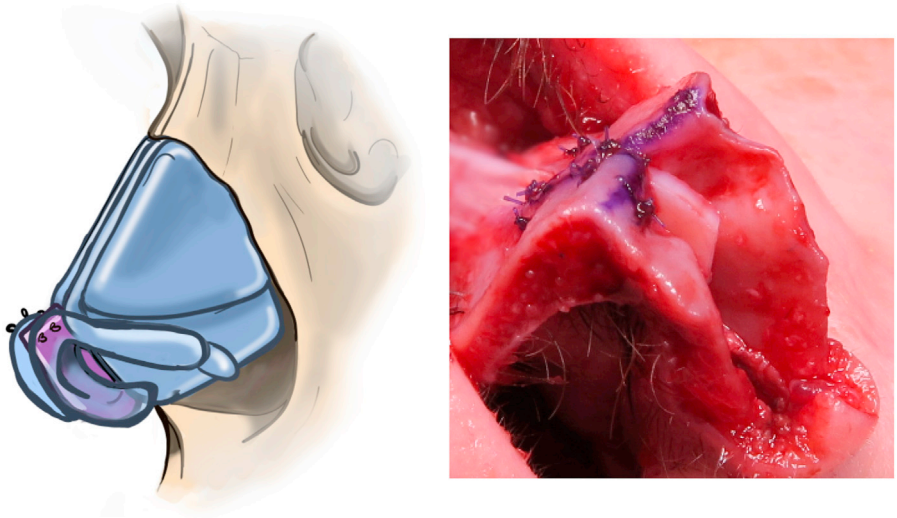

**Fig. 1.** Diagrammatic and operative representations of caudal septal extension grafts that can be used in structural preservation cases. These grafts can provide additional stability to the septum and allow for the nasal tip to be projected and rotated to an ideal position. In deviated noses, these grafts can be placed opposite of the deviated side to improve tip position and symmetry.

septum without extension, as it sits in a more superior position relative to the dorsum that has been lowered cephalically.

In the deviated nose, a asymmetric wedge resection of bone in an LD procedure with greater bone removed on the nondeviated side can help correct a straight deviation.[36,41,42] Alternatively, the bone may only be resected on the side of the deviation, with a PD performed on the nondeviated side (**Fig. 2**). These differential bony changes are

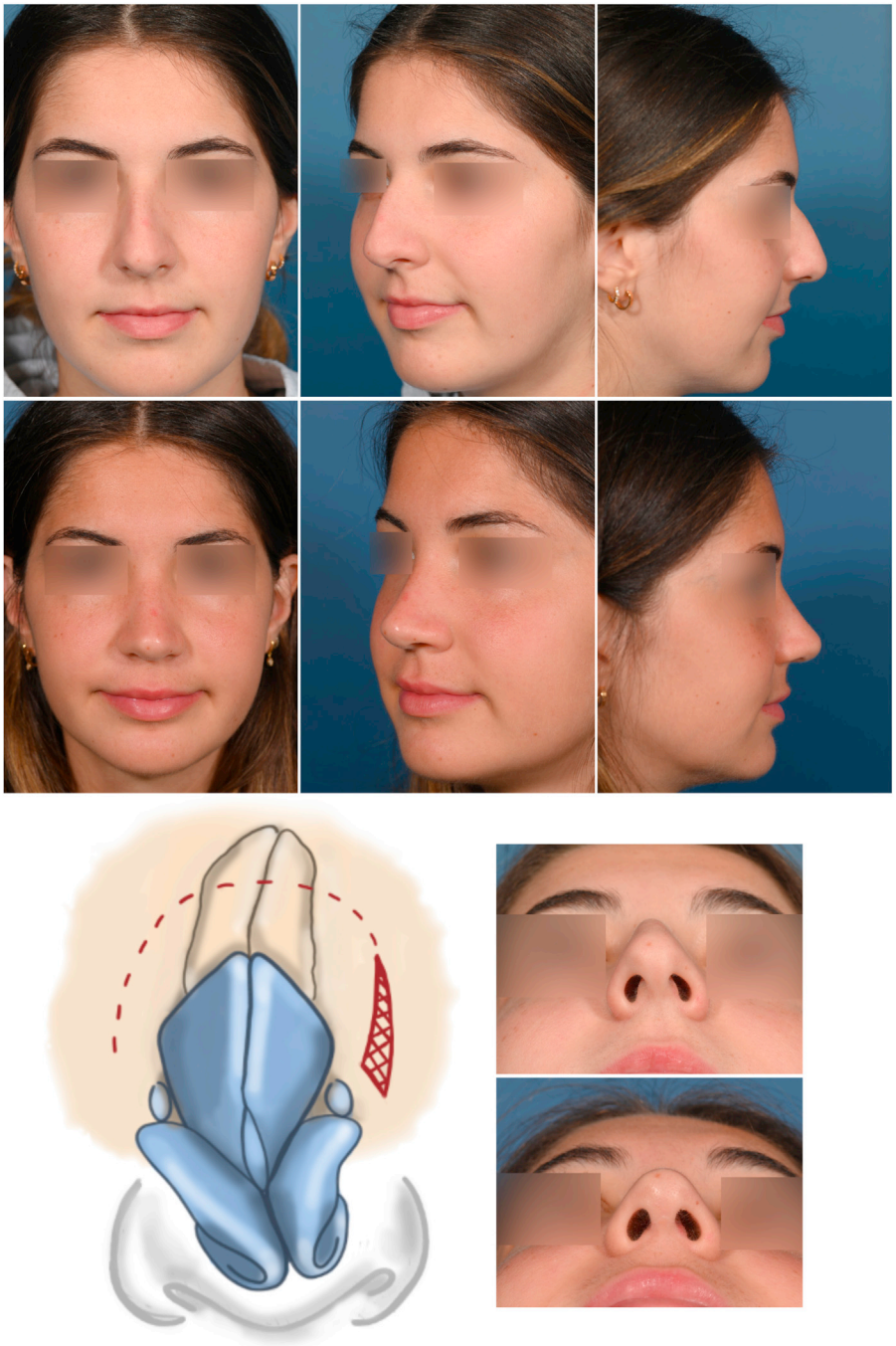

**Fig. 2.** In the deviated nose, an asymmetric wedge resection of bone (or a LD on 1 side and PD on the deviated side) can allow for the correction of the nasal deformity. The patient shown underwent an asymmetric let down procedure with the MSSM method. The nasal tip was treated with articulated rim grafts and cranial tip sutures. The patient is shown 12 months after surgery.

stabilized by suturing the subdorsal septum to the lower septum on the nondeviated side.[30] Although this will correct dorsal deviations, the nasal tip will need to be addressed via structural methods, a benefit afforded by SPR. A septal extension graft sutured to the preoperatively nondeviated side allows for stabilization of the nasal tip in a more midline orientation (**Fig. 3**).

In cases with severe anterior septal deviations, the use of preservation techniques is less favorable. As aforementioned, the Cottle technique may be valuable in this setting. If necessary, an anterior septal reconstruction with resection of native caudal septum is possible with dorsal preservation.[43] Use of the dorsal osseocartilaginous horizontal mattress (DOHM) suture is advantageous in this situation. Importantly, patients with dorsal humps and an associated high septal deviation may be best managed with preservation techniques.[11] This is particularly true when the high septum deviates to the same side as the deviated nasal vault, a so-called unfavorable dorsal septal gap (DSG). This is because with traditional structural techniques, medialization of nasal bone on the deviated side after osteotomies will be hindered by the high septal deviation.[11,44]

Finally, structural modification of the nasal tip can be performed in any capacity with traditional structural techniques. Although this topic is too exhaustive for review here, it should be noted that any traditional technique can be used for restructuring the ala cartilages. In cases of severely distorted lower lateral cartilages, partial resection and use of lateral crural strut grafting can be performed. This method also allows for repositioning of the ala. The use of miniature-lateral crural strut grafts can reduce the convexity of the ala and is an effective tip-plasty technique (3–4).[45] These methods require elevation of the vestibular lining from the undersurface of the crura. Lateral crural overlay requires an incision of the lower lateral crura but can effectively deproject and rotate the tip. The overlap and preservation of, rather than resection of cartilage, minimizes weakness to the ala. The nasal tip can be suspended to the caudal septum or extension grafting with a tongue in groove or inter-domal/ala sutures (eg, alar spanning suture, figure of 8 suture through domes). **Figs. 2–5** show examples of patients who have undergone structural preservation with preservation techniques used for the dorsum and structural techniques for the nasal tip.

**Fig. 3.** Patient is shown before and 12 months after structural preservation rhinoplasty. The patient underwent an LD procedure with MSSM (sutured to the right side). A septal extension graft, very modest cephalic trim, along with mini-lateral crural struts, cranial tip sutures, and an alar spanning suture were used to better define the nasal tip. The bony cap was contoured with a piezo.

**Fig. 4.** Patient is shown before and 5 months after structural preservation rhinoplasty. The patient underwent a let-down procedure with MSSM. A very modest cephalic trim, along with mini-lateral crural struts, cranial tip sutures, and an alar spanning suture were used to better define the nasal tip.

**Fig. 5.** Patient is shown before and 7 months after structural preservation rhinoplasty. The patient underwent an LD procedure with MSSM. Cephalic turn in flaps, cranial tip sutures, and an alar spanning suture were used to better define the nasal tip. Alar base reductions were also done.

## TIP-PLASTY WITH A PRESERVATION LENS

Although DPR has been popularized over the last 5 years, the concepts of tip preservation have been applied more generally over a longer period of time. This results from years of rhinoplasty experience in which destructive tip techniques or methods to aggressively reduce ala cartilage size resulted in long-term nasal functional and aesthetic abnormalities such as pinched tips, alar retraction, and overrotation of the nasal tip. The resective ideology in rhinoplasty has given way to strategies that revolve around cartilage modification and preservation of underlying anatomy when possible. This has been done in the setting of open structural cases in which the dorsum may be preferentially treated with resection and reconstruction rather than preservation. In some ways then, the progression to adding DPR to structural methods is simply a continuation of preservation methods that have been already applied to the structural techniques of the tip. In other words, lateral crural conservation is equally a part of structural surgery as it is part of preservation work.

With regards to contouring the lateral crura, common structural techniques with a preservation emphasis include limited cephalic resection, suture modification for dome creation, lateral crural overlay, cephalic turn-in flaps, and hinge flaps of the lower lateral cartilage that preserve the scroll ligament.[32,46–51] When lateral cartilage is excised, it should include precise measurements that aim at preserving as much endogenous cartilage as possible (minimum of 8 mm of remaining lateral crural width). Cephalic turn-in flaps use cartilage that may have been resected to decrease tip bulbosity (see **Fig. 5**). Although this method may also add support to the lateral ala, the pliability of the cartilage can result in inferior ability to modify the intrinsic lateral crural shape relative to lateral crural strut grafting. However, added suture techniques such as lateral crural tensioning or lateral crural steal can further help contour the lateral crura while preserving tissue.[52–54] Lateral crural tensioning with rim grafts has been shown to have similar efficacy to lateral crural strut grafts.[55]

## PRESERVATION OF THE SOFT TISSUE ENVELOPE

In the open structural preservation approach, DPR can be performed with wide exposure of the nasal bones. This is different from structural techniques in which the nasal bones are not cleared of periosteum other than in the paramedian location to preserve soft tissue attachments and prevent flail segments after osteotomies. The en bloc management of the dorsum will result in less irregular displacement of the nasal bones despite any release of soft tissue attachments in preservation cases. However, there is a risk of a straight axis deviation if this whole segment inadvertently twists or is displaced to 1 side preferentially.

Preservation ideology emphasizes limited soft tissue elevation when possible, with nasal dissection occurring in a sub-perichondrial–sub-periosteal plane to minimize disruption to ligamentous and muscular attachments. Dissection in a subsuperficial musculoaponeurotic system (SMAS) plane theoretically increases risk of swelling and scar remodeling. Although elevation in the subperichondrial plane may impart theoretic benefits, at present, there are no comparative data to suggest its superiority.[32,46,56] Moreover, there may be limitations to this approach. In patients with weaker cartilage, the perichondrial layer may add strength to the nasal tissue, and if using preservation suture techniques, the integrity of the cartilage is imperative in effecting change to the cartilage suprastructure. In addition, weaker cartilage may not accommodate sutures.

Nonetheless, limited soft tissue dissection and its theoretic benefits can be applied in a graded approach to open structural surgery, thus reflecting a fusion between preservation and structural techniques.[57] If the dorsum is to be treated with solely preservation techniques, there is not a the need for complete release of dorsal soft tissue attachments. Windows for osteotomies can also be made without disrupting some of the midline or paramedian soft tissue attachments. In addition to minimizing risk of edema, maintaining these attachments can help better stabilize changes in the bone similar to that seen in structural cases. This may be the most helpful at the level of the radix, where there can be an inadvertent drop in nasal height.

## USING STRUCTURAL METHODS TO ALLOW FOR DORSAL PRESERVATION

As aforementioned, the use of DPR techniques has benefits for dorsal aesthetic lines and midvault integrity. However, not all patients are candidates for DPR in with their preoperative native anatomy. In some patients, structural modifications can be made to permit preservation methodology – again, reflecting the merger of these 2 techniques.

On profile view, nasal bones may be S- or V-shaped (**Fig. 6**).[58] V-shaped nasal bones have a straight contour between the radix and the rhinion (apex of the hump at the rhinion) and are deemed better for preservation methods. S-shaped nasal bones have a more kyphotic contour, with the most prominent point located cephalic to the rhinion. As such, S-shaped bones

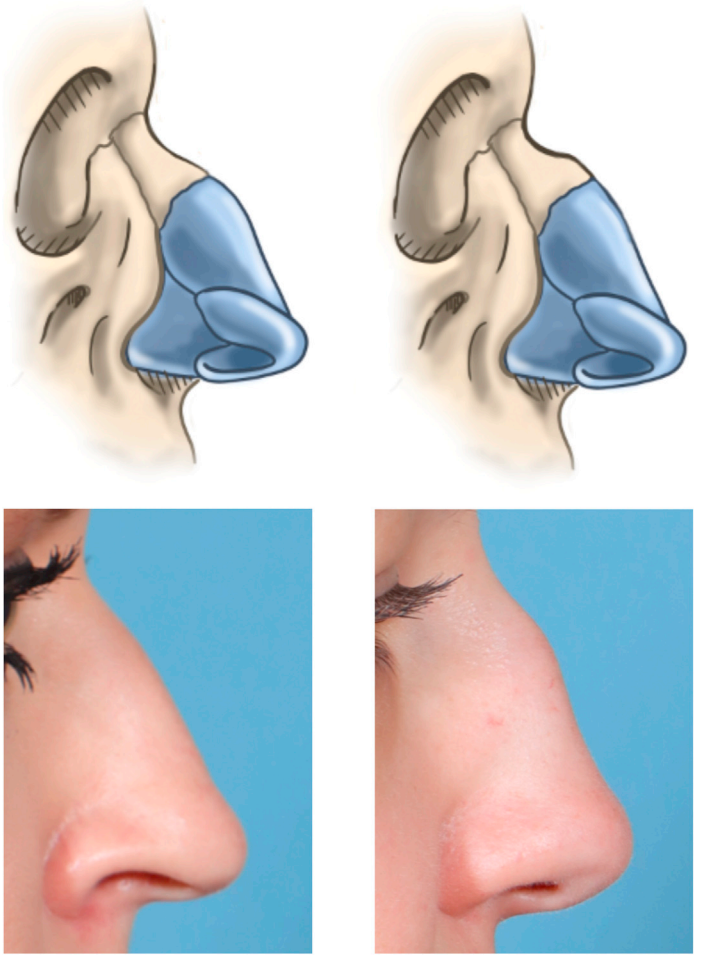

**Fig. 6.** Nasal bones may be V- (*left*) or S-shaped (*right*). V-shaped nasal bones have a straight contour between the radix and the rhinion. S-shaped nasal bones have a more kyphotic contour, with the most prominent point located cephalic to the rhinion.

have a higher likelihood of an osseous residual hump with preservation methods. Patients with V-shaped nasal bones had been shown to have improved postoperative SCHNOS scores and shorter operative times compared with S-shaped nasal bones.[14] Structural osteoplasty methods to the bony cap can be used to convert some of the unfavorable convexity of S-shaped bones to the more favorable V configuration.[59–62] Although the authors prefer the use of piezo instruments, surface modifications can be performed with rasps, burrs, or other contouring devices.[63]

These methods are also helpful at addressing bony irregularities observed in the frontal view. Importantly, however, there is a limit to surface modifications. If aggressive manipulation is done to the bones and there are resulting open roof deformities, preservation methods are no longer possible. The authors therefore favor a stepwise approach in which attempts are made at converting dorsal irregularities to preservation candidates, with the flexibility to convert to a full structural approach if needed. Additionally, structural methods can be used after preservation work has been completed to the dorsum. For example, after deprojection, if there is an appearance of a residual hump, structural refinement maneuvers may have to be considered. This again includes osteoplasty. In addition, drops at the radix may be treated with grafting to camouflage irregularities, highlighting the fusion of structural and preservation options.

Dorsal irregularities can also include unilateral concavities or asymmetries in the middle vault. As described earlier, deviations in the nose can be treated with asymmetric maneuvers to the osseous vault. However, midvault asymmetries may not entirely be corrected with this approach. The placement of submucosal spreader grafts can be placed to correct a unilateral abnormality in this setting.[7] If submucosal tunnels are used, bilateral mucoperichondrial flaps are elevated off of the septum, leaving mucosa attached to the upper dorsal septum as it meets the ULCs.

Alternatively, it is possible to separate the most caudal attachments of the ULC to each other and the septum (paraseptal cleft) and place a spreader graft if necessary (**Fig. 7**).[7,11] In this scenario, the osseocartilaginous connection between the nasal bones and the septum is still preserved. A similar method may be used for narrow cartilaginous vaults, where bilateral spreader grafts may be implemented. Although autospreader flaps made from the fold-in of the ULCs would be consistent with preservation principles, this is more difficult to do without more extensive release of the ULCs from the septum.

In the authors' experience, sometimes the lowering of the dorsum can result in prominence of the anterior edge of the ULC into the airway. In this scenario, at the W point, edges of the ULC may have to be resuspended more superiorly, excised, or tensioned with a partial auto spreader flap. Excision within the nose is less favored. Prominent ULC horns can disrupt the dorsal aesthetic lines. Preservation techniques can result in flaring and widening of the midvault also. That ballerina maneuver, consisting of disarticulation of the lateral keystone (nasal bone and ULC junction) can help with this. Horizontal mattress suture techniques to tighten the ULCs against the septum or conservative contouring of any cartilaginous prominences can also be performed.

## MODIFIED PARTIAL DORSAL PRESERVATION TECHNIQUES INCORPORATING STRUCTURAL METHODS

Maintaining the osseocartilaginous junction and the ULC fusion with the septum at the midvault conceptually defines preservation rhinoplasty. However, modified preservation techniques have been described that only partially preserve these sites and simultaneously implement some degree of structural methodology. These hybrid techniques (several of which are referred to as surface techniques to differentiate from foundational techniques that require impaction osteotomies) reflect the final category of a fusion between preservation and structural techniques. Some of these techniques are reviewed here.

In the spare roof technique, the cartilaginous midvault (ULC attachment to the septum) is preserved, but the bony vault is treated independently.[64] Because the nasal bones are separated from the ULC, this departs from classic preservation descriptions. Structural techniques, including ostectomy of the caudal aspect of nasal bones, is performed, followed by a combination of medial and lateral osteotomies used to close an open roof.

There have been other descriptions of disarticulation of the ULC from the nasal bones, with subsequent preservation of the midvault but the management of the osseous hump with rasping/osteotomes.[65–67] These methods are ideal for smaller humps. Similar midvault preservation techniques have been described but with the additional preservation of the midline junction between the bony cap and dorsal cartilage (cartilage push down with bony cap preservation).[68] Disarticulation of the entire septal bony-cartilaginous junction is performed, and osteotomies are performed around the bony cap, allowing the entire midline to move en bloc. Lateral osteotomies are used medialize the nasal bones. Despite cartilaginous

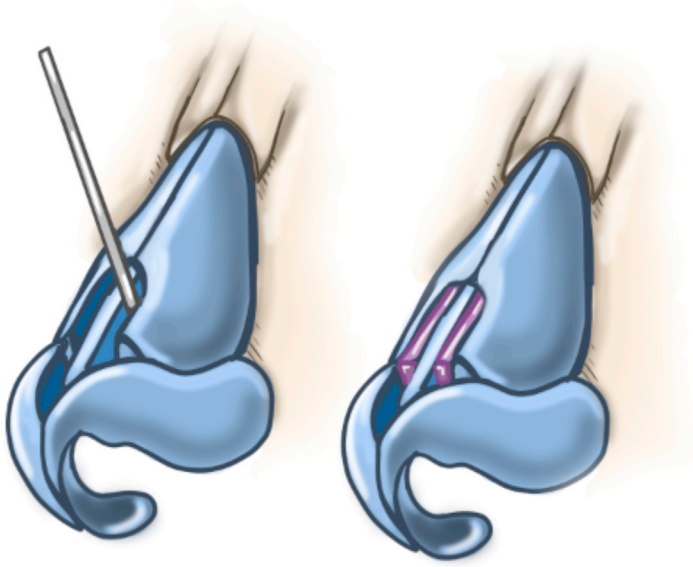

**Fig. 7.** In structural preservation methods, spreader grafts can be placed after separation of the most caudal attachments of the upper lateral cartilage at the para-septal cleft (sometimes past the W point). The osseocartilaginous connection between the nasal bones and the septum is still preserved, and most of the upper lateral cartilage remains attached to the septum. Both bilateral and unilateral spreaders can be used.

midvault preservation, the overlap with structural dorsal rhinoplasty is evident with these types of techniques.

In the modified dorsal split preservation technique, the junction between the nasal bones and dorsal cartilage (dorsal keystone) is preserved; however, the ULC is separated from septum.[8] This separation occurs with the horizontal flared edges at the ULC-septum interface preserved on the septal side. The central component, including the nasal bones and the cartilaginous septum, is lowered using traditional preservation techniques. This approach allows for reshaping and control of the width and symmetry of the cartilaginous vault.

In the dorsal roof technique, the ULCs are similarly separated from the septum; however, the dorsal keystone is preserved.[69] Medial osteotomies (at the dorsal aesthetic lines) and a radix osteotomy allow for a preservation style lowering of the bony-cartilaginous dorsum. However, lateral osteotomies are required to eliminate the space created by the descent of the midaspect of the bony vault, reflecting a fusion between structural and preservation methods.

## SUMMARY

The modern ideology of rhinoplasty acknowledges the value of preserving the nasal architecture when feasible, while recognizing the importance of structural techniques for addressing complex deformities. Historically, the choice in dorsal reduction was binary—either release the upper lateral cartilages or not—but today, advancements in dorsal preservation have expanded the range of options. Techniques such as modification of the bony cap, vertical osteotomies, and radix grafting now allow for preservation of the cartilaginous vault.

Despite past perceptions of structural methods as destructive, these techniques are unrivaled in their ability to manage intricate nasal deformities. They are not incompatible with preservation methods; in fact, they can be complementary. Structural rhinoplasty can make a nasal dorsum more suitable for preservation work, particularly in complex cases when the lower third or nasal tip requires more targeted intervention.

For instance, although DPR maintains favorable features of a patient's dorsum, structural approaches may better address nasal tip deficiencies. Even then, the tip can be treated with a preservation mindset. Similarly, the open approach can preserve soft tissue in a graded manner, blending preservation and structural strategies.

Thus, the dichotomy between dorsal preservation and structural rhinoplasty is misleading. Both methods can be effectively fused to achieve optimal results, especially when structural techniques are employed for grafting and stabilization of the framework. This combined approach enhances the versatility and precision available to the rhinoplasty surgeon, allowing for the best possible outcomes for the dorsum, midvault, and nasal tip.

## CLINICS CARE POINTS

- Integrating structural and preservation techniques can allow for more versatility in rhinoplasty, resulting in positive cosmetic and functional outcomes.
- Dorsal preservation is favored when appropriate and structural techniques can help convert dorsal convexities to preservation candidates or finesse outcomes of a preservation case.
- Although classic preservation attempts to maintain the osseocartilaginous junction and the upper lateral cartilage fusion with the septum at the midvault, modified preservation techniques can be used that disrupt some of these relationships with good outcomes.
- Structural approaches to the lower third should employ preservation concepts when possible, in which destructive tip techniques and violation of soft tissue envelopes are minimized.

## DISCLOSURES

The authors have nothing to disclose.

## REFERENCES

1. Saban Y, Daniel RK, Polselli R, et al. Dorsal preservation: the push down technique reassessed. Aesthetic Surg J 2018;38(2):117–31.
2. Patel PN, Most SP. Combining open structural and dorsal preservation rhinoplasty. Clin Plast Surg 2022;49(1):97–109.
3. Stergiou G, Schweigler A, Finocchi V, et al. Quality of life (QoL) and outcome after preservation rhinoplasty (PR) using the rhinoplasty outcome evaluation (ROE) questionnaire-a prospective observational single-centre study. Aesthetic Plast Surg 2022;46(4):1773–9.
4. Tham T, Bhuiya S, Wong A, et al. Clinical outcomes in dorsal preservation rhinoplasty: a meta-analysis. Facial Plast Surg Aesthet Med 2022;24(3):187–94.
5. Wells MW, DeLeonibus A, Barzallo D, et al. Exploring the resurgence of the preservation rhinoplasty: a systematic literature review. Aesthetic Plast Surg 2023;47(4):1488–93.

6. DeSisto NG, Okland TS, Patel PN, et al. State of the evidence for preservation rhinoplasty: a systematic review. Facial Plast Surg 2023;39(4):333–61.
7. Toriumi DM, Kovacevic M, Kosins AM. Structural preservation rhinoplasty: a hybrid approach. Plast Reconstr Surg 2022;149(5):1105–20.
8. Robotti E, Chauke-Malinga NY, Leone F. A modified dorsal split preservation technique for nasal humps with minor bony component: a preliminary report. Aesthetic Plast Surg 2019;43(5):1257–68.
9. Robotti E, Cottone G, Leone F. Modified dorsal split preservation hybrid rhinoplasty for cartilaginous pushdown and full letdown applications: a prom-based review of 100 consecutive cases. Facial Plast Surg 2023;39(4):441–51.
10. Robotti E, Leone F, Malfussi VA, et al. The "3 points compartmentalization" technique in subperichondrial-subperiosteal dissection in primary rhinoplasty to reduce edema and define contour. Aesthetic Plast Surg 2022;46(4):1923–31.
11. Patel PN, Abdelwahab M, Most SP. A review and modification of dorsal preservation rhinoplasty techniques. Facial Plast Surg Aesthet Med 2020;22(2): 71–9.
12. Patel PN, Kandathil CK, Buba CM, et al. Global practice patterns of dorsal preservation rhinoplasty. Facial Plast Surg Aesthet Med 2022;24(3):171–7.
13. Patel PN, Kandathil CK, Abdelhamid AS, et al. Matched cohort comparison of dorsal preservation and conventional hump resection rhinoplasty. Aesthetic Plast Surg 2022. https://doi.org/10.1007/s00266-022-03156-3.
14. Qaradaxi KA, Mohammed AA, Mohammed HN. The outcome of V vs. S shaped nasal deformity in preservation rhinoplasty; a comparative study. Ann Chir Plast Esthet 2022;67(4):239–44.
15. Tas BM, Erden B. Comparison of nasal functional outcomes of let-down rhinoplasty and open technical rhinoplasty using spreader graft. Eur Arch Oto-Rhino-Laryngol 2021;278(2):371–7.
16. Zarei R, Most SP, Amali A, et al. Comparison of functional and cosmetic outcomes between dorsal preservation and spreader flap rhinoplasty: a randomized trial. Aesthetic Surg J 2024;44(7):NP444–53.
17. Montes-Bracchini JJ. Nasal profile hump reduction using the let-down technique. Facial Plast Surg 2019;35(5):486–91.
18. Goodale JL. A new method for the operative correction of exaggerated roman nose. Boston Med Surg J 1899;140:112.
19. Goodale JL. The correction of old lateral displacements of the nasal bones. Boston Med Surg J 1901;145:538–9.
20. Lothrop O. An operation for correcting the aquiline nasal deformity; the use of new instrument; report of a case. Boston Med Surg J 1914;170: 835–7.
21. FL. U. Let down technique. Available at: https://www.rhinoplastyarchive.com/articles/let-down-technique. Accessed December 12, 2019.
22. Montes-Bracchini JJ. Preservation rhinoplasty (let-down technique) for endonasal dorsal reduction. Facial Plast Surg Clin North Am 2021;29(1): 59–66.
23. Sebileau P, Dufourmentel L. Correction chirurgicale des difformités congénitales et acquises de la pyramide nasale. Paris: Arnette; 1926. p. 104–5.
24. Cottle MH, Loring RM. Corrective surgery of the external nasal pyramid and the nasal septum for restoration of normal physiology. Ill Med J 1946;90: 119–35.
25. Friedman O, Ulloa FL, Kern EB. Preservation rhinoplasty: the endonasal cottle push-down/let-down approach. Facial Plast Surg Clin North Am 2021; 29(1):67–75.
26. Patel PN, Most SP. Overview of dorsal preservation rhinoplasty. Facial Plast Surg Clin North Am 2023; 31(1):1–11.
27. Neves JC, Arancibia Tagle D, Dewes W, et al. The split preservation rhinoplasty: "the Vitruvian Man split maneuver". Eur J Plast Surg 2020;43:323–33.
28. Patel PN, Abdelwahab M, Most SP. Dorsal preservation rhinoplasty: method and outcomes of the modified subdorsal strip method. Facial Plast Surg Clin North Am 2021;29(1):29–37.
29. Neves JC, Arancibia Tagle D, Dewes W, et al. The segmental preservation rhinoplasty: the split tetris concept. Facial Plast Surg 2020. https://doi.org/10.1055/s-0040-1714672.
30. Neves JC, Tagle DA, Dewes W, et al. A segmental approach in dorsal preservation rhinoplasty: the tetris concept. Facial Plast Surg Clin North Am 2021; 29(1):85–99.
31. Toriumi DM, Kovacevic M. Dorsal preservation rhinoplasty: measures to prevent suboptimal outcomes. Facial Plast Surg Clin North A 2021;29(1):141–53.
32. Cakir B, Saban Y, Daniel RK, et al. Preservation rhinoplasty book. Septum Publishing; 2018.
33. Kosins AM. Expanding indications for dorsal preservation rhinoplasty with cartilage conversion techniques. Aesthetic Surg J 2020. https://doi.org/10.1093/asj/sjaa071.
34. Kovacevic M, Veit JA, Toriumi DM. Subdorsal Z-flap: a modification of the Cottle technique in dorsal preservation rhinoplasty. Curr Opin Otolaryngol Head Neck Surg 2021;29(4):244–51.
35. Kovacevic M, Buttler E, Haack S, et al. Dorsal preservation septorhinoplasty. HNO 2020. https://doi.org/10.1007/s00106-020-00949-3. Die nasenruckenerhaltende "Dorsal-Preservation"-Septorhinoplastik.
36. GM. Chirurgie maxilla-faciale. Paris: Le François; 1940. p. 1127–33.
37. Gola R, Nerini A, Laurent-Fyon C, et al. [Conservative rhinoplasty of the nasal canopy]. Ann Chir Plast

Esthet 1989;34(6):465–75. Rhinoplastie conservatrice de l'auvent nasal.
38. Saban Y, Braccini F, Polselli R. [Rhinoplasty: morphodynamic anatomy of rhinoplasty. Interest of conservative rhinoplasty]. Rev Laryngol Otol Rhinol 2006;127(1–2):15–22. La rhinoplastie : anatomie morpho-dynamique de la rhinoplastie. Interet de la rhinoplastie "conservatrice".
39. Dewes W, Zappelini CEM, Ferraz MBJ, et al. Conservative surgery of the nasal dorsum: septal pyramidal adjustment and repositioning. Facial Plast Surg 2021;37(1):22–8.
40. Toriumi DM, Checcone MA. New concepts in nasal tip contouring. Facial Plast Surg Clin North Am 2009;17(1):55–90, vi.
41. Ozucer B, Cam OH. The effectiveness of asymmetric dorsal preservation for correction of i-shaped crooked nose deformity in comparison to conventional technique. Facial Plast Surg Aesthet Med 2020;22(4):286–93.
42. East C. Preservation rhinoplasty and the crooked nose. Facial Plast Surg Clin North Am 2021;29(1):123–30.
43. Patel PN, Abdelwahab M, Most SP. Combined functional and preservation rhinoplasty. Facial Plast Surg Clin North Am 2021;29(1):113–21.
44. Most SP. Comprehensive rhinoplasty: structural and preservation concepts. Incorporated: Quality Medical Publishing; 2022.
45. Abdelwahab M, Most SP. The miniature lateral crural strut graft: efficacy of a novel technique in tip plasty. Laryngoscope 2020;130(11):2581–8.
46. Daniel RK, Palhazi P. The nasal ligaments and tip support in rhinoplasty: an anatomical study. Aesthetic Surg J 2018;38(4):357–68.
47. Surowitz JB, Most SP. Complications of rhinoplasty. Facial Plast Surg Clin North Am 2013;21(4):639–51.
48. Murakami CS, Barrera JE, Most SP. Preserving structural integrity of the alar cartilage in aesthetic rhinoplasty using a cephalic turn-in flap. Arch Facial Plast Surg 2009;11(2):126–8.
49. Sazgar AA, Most SP. Stabilization of nasal tip support in nasal tip reduction surgery. Otolaryngol Head Neck Surg 2011;145(6):932–4.
50. Sazgar AA, Woodard C, Most SP. Preservation of the nasal valve area with a lateral crural hinged flap: a cadaveric study. Aesthetic Plast Surg 2012;36(2):244–7.
51. Tellioglu AT, Cimen K. Turn-in folding of the cephalic portion of the lateral crus to support the alar rim in rhinoplasty. Aesthetic Plast Surg 2007;31(3):306–10.
52. Kovacevic M, Wurm J. Cranial tip suture in nasal tip contouring. Facial Plast Surg 2014;30(6):681–7.
53. Behmand RA, Ghavami A, Guyuron B. Nasal tip sutures part I: the evolution. Plast Reconstr Surg 2003;112(4):1125–9 [discussion: 1146–9].
54. Guyuron B, Behmand RA. Nasal tip sutures part II: the interplays. Plast Reconstr Surg 2003;112(4):1130–45 [discussion: 1146–9].
55. Kondo M, Orgain C, Alvarado R, et al. The effects of lateral crural tensioning with an articulated alar rim graft versus lateral crural strut graft on nasal function. Facial Plast Surg Aesthet Med 2020;22(4):281–5.
56. Cakir B, Oreroglu AR, Dogan T, et al. A complete subperichondrial dissection technique for rhinoplasty with management of the nasal ligaments. Aesthetic Surg J 2012;32(5):564–74.
57. Goksel A, Saban Y, Tran KN. Biomechanical nasal anatomy applied to open preservation rhinoplasty. Facial Plast Surg 2021;37(1):12–21.
58. Lazovic GD, Daniel RK, Janosevic LB, et al. Rhinoplasty: the nasal bones - anatomy and analysis. Aesthetic Surg J 2015;35(3):255–63.
59. Neves JC, Arancibia-Tagle D. Avoiding aesthetic drawbacks and stigmata in dorsal line preservation rhinoplasty. Facial Plast Surg 2021;37(1):65–75.
60. Ferraz MBJ, Sella GCP. Indications for preservation rhinoplasty: avoiding complications. Facial Plast Surg 2021;37(1):45–52.
61. Saban Y, de Salvador S. Guidelines for dorsum preservation in primary rhinoplasty. Facial Plast Surg 2021;37(1):53–64.
62. patel PN, Most SP. Preservation of the nasal vault. In: Most SP, editor. Comprehensive rhinoplasty: structural and preservation concepts. Quality Medical Publishing; 2023.
63. Robotti E, Khazaal A, Leone F, et al. Combining piezo and power tools for a better outcome in hybrid structural-preservation rhinoplasty. Aesthetic Plast Surg 2024. https://doi.org/10.1007/s00266-024-04278-6.
64. Ferreira MG, Monteiro D, Reis C, et al. Spare roof technique: a middle third new technique. Facial Plast Surg 2016;32(1):111–6.
65. Ishida J, Ishida LC, Ishida LH, et al. Treatment of the nasal hump with preservation of the cartilaginous framework. Plast Reconstr Surg 1999;103(6):1729–33 [discussion: 1734–5].
66. Ozturk G. Push-down technique without osteotomy: a new approach. Aesthetic Plast Surg 2020;44(3):891–901.
67. Azizli E, Bayar Muluk N, Dundar R, et al. A new preservation technique for dehumping the dorsum. Eur Rev Med Pharmacol Sci 2023;27(2 Suppl):57–62.
68. Ishida LC, Ishida J, Ishida LH, et al. Nasal hump treatment with cartilaginous push-down and preservation of the bony cap. Aesthetic Surg J 2020;40(11):1168–78.
69. Tas S. Dorsal roof technique for dorsum preservation in rhinoplasty. Aesthetic Surg J 2020;40(3):263–75.