

Cosmetic Rhinoplasty and Nasal Obstruction

What I Look for, How Do I Evaluate the Patient



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KEYWORDS

- Functional rhinoplasty • Articulated alar rim grafts • Nasal valve • Nasal obstruction
- Cosmetic rhinoplasty

KEY POINTS

- It is crucial to evaluate patients with cosmetic rhinoplasty for nasal airway obstruction. Cosmetic nasal surgery elements can potentially reduce air space or alter lateral wall mechanical properties.
- A detailed analysis should prioritize the mid-vault and external valve region.
- Turbinate reduction is a critical addition to rhinoplasty surgery, straightforward to perform, and can substantially enhance airflow.
- Grafting and suture techniques play significant roles in establishing nasal airway function and improving cosmetic outcomes.

PANEL DISCUSSION

How do I evaluate the patient?

What surgical techniques do I use to treat the internal nasal valve dysfunction?

What surgical techniques do I use to treat the external nasal valve dysfunction?

In a purely cosmetic rhinoplasty, how do you prevent compromise of nasal function?

How important is the reconstruction of the scroll area in your procedures? Do you do it routinely? What techniques do you use?

How have your techniques in this area changed over the last 2 y?

HOW DO I EVALUATE THE PATIENT?

Wong

Each patient completes an intake form, providing a comprehensive medical history and nasal obstruction scoresheet.¹ During examination, I

conduct a thorough assessment of the entire head and neck, with particular focus on dynamic valve collapse and nasal endoscopy. The nasal vault is examined both with and without a decongestant, and detailed notes are taken on the geometry of the lower alar cartilages and regions of the septum

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that may restrict airflow. While routine computed tomographic (CT) imaging is not standard practice, it may be selectively ordered for patients undergoing cleft palate rhinoplasty, selected revision procedures, or severe trauma cases. Standardized photography is employed (DSLR, 100 mm macro lens). I photograph a second set of frontal and lateral images with an adhesive specimen marker (millimeter scale) placed on the skin. It provides accurate conversion from pixels to actual distance. In surgery, I utilize a projectometer to ensure precise measurements on photographs displayed in the operating room.² Simulation tools are limited to Photoshop (Adobe, San Jose, CA) and PowerPoint (Microsoft, Redmond, WA). Patient consultation is prioritized to identify any factors that may deem them suboptimal candidates for esthetic surgery. For patients with sinonasal disease beyond airflow obstruction, I refer them to 1 of 2 rhinologists for further evaluation. These specialists may recommend additional imaging, such as a CT scan, which I will visualize using Horus (Horusproject.org Nimble Co LLC, Annapolis, MD USA).

Heppt

During the consultation, a structured anamnesis with the aid of a standardized questionnaire such as the Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS) is suitable, which allows both esthetic and functional issues to be evaluated.³ This is followed by endoscopy of the nasal cavity and palpation of the nasal framework, including functional measurement by rhinomanometry and/or acoustic rhinometry. In addition to the assessment of the septum, turbinates, and bony aperture, the detection of constrictions in the isthmus region (so-called inner nasal valve) and of collapse phenomena of the ala (so-called outer nasal valve) is crucial in the evaluation of functional disorders. Cone beam CT combined with the use of computational fluid dynamics (CFD)-based flow simulations is becoming more and more significant as this method can be used to assign functional parameters to morphologic conditions.⁴ Finally standard portrait images in lateral, frontal, semi-oblique, inferior, and superior imaging techniques with simulations and morphing are nowadays part of the setting. In addition to the usual rhinological diagnostic procedures, it is also important to assess the skin mantle of the nose and any existing skin diseases in order to obtain the best cosmetic result.

Twu

My evaluation of the patient desiring rhinoplasty includes a comprehensive approach that integrates

history-taking, physical examination, laboratory tests, imaging studies, functional measurement, and photography. Initially, recognizing the patient's motivations for seeking rhinoplasty, either esthetic or functional, as well as any prior injury or iatrogenic procedures. This step is crucial in assessing patient expectations and determining the feasibility of achieving desired results. Furthermore, identifying any systemic or psychological diseases through careful history-taking is essential as these may have implications on anesthesia risk and postoperative recovery. Proper history-taking can guide not only clinical decision-making but also establish rapport with the patient by addressing concerns and setting realistic expectations.

Subsequently, a detailed physical examination focuses on both internal and external nasal anatomy to identify structural abnormalities or deviations that might require correction during surgery. Laboratory tests are selectively performed based on the medical history collected; for instance, coagulation profiles can be pivotal in patients with a history suggestive of bleeding disorders. Imaging studies such as sinus plain films or CT scans offer information regarding organic and structural deformities including underlying sinonasal diseases. Objective functional measurements including acoustic rhinometry, rhinomanometry, and olfaction test help detect existing respiratory impediments and can serve as evidence for medicolegal issues.

WHAT SURGICAL TECHNIQUES DO I USE TO TREAT THE INTERNAL NASAL VALVE DYSFUNCTION?

Wong

The internal nasal valve is a region, not a specific area or location within the nose, and is the gateway for airflow to the rest of the airway.⁵ Broadly speaking it is where the cross-sectional areas of the airway successively narrow. This tapering leads to increased flow velocity and a pressure drop.⁶ Transmural pressure drops result in motion and collapse of lateral wall as the upper lateral cartilage is flexible. During breathing, even a modest inspiratory effort can create a displacement as small as 0.5 mm; this may result in the sensation of obstruction. The perception of nasal obstruction is very sensitive to small changes in geometry in this area. The nose does not have a "flow sensor" per se, sensory nerves detect temperature drops, and shear forces that are produced by the flow of air, and this is more dramatic in turbulent flow.

For internal nasal valve collapse, my workhorse is in the spreader grafts because even the expansion of the mid-vault by 1 to 2 mm results in

significant improvement in symptoms. The impact of spreader graft placement between the upper lateral and quadrangular cartilage extends beyond volumetric expansion. Proper suture fixation of the graft results in the creation of tension along the upper lateral cartilage reducing laxity. A substantial amount of improvement from the split hump approach is due to tightening of the upper lateral cartilage.

Heppt

An inner nasal valve stenosis also referred to as isthmus stenosis is often caused by a septal deviation, long upper lateral cartilages, overprojection of tip, and dorsum and last but not least previous rhinoplasty. It is characterized by a reduced isthmus angle and/or a reduced cross-sectional valve area that severely affects breathing, since this anatomic zone is the narrowest in the nose, responsible for airstream regulation. There are several techniques for the correction of an isthmus stenosis generally based on widening of the cross-section area and on opening the angle between the septum and the upper lateral cartilages. Next to septal correction, the most common procedures favored by the author include the Lopez Infante technique and the nasal valve lift. The Lopez Infante technique⁷ consists of partial resection of excess cartilage and vestibular skin with refixation in craniolateral direction (**Fig. 1**). It is quick and very effective and indicated when an isthmus stenosis is based on an elongated caudal edge of the upper lateral cartilage.

A very useful and minimal invasive technique is the nasal valve lift (**Fig. 2**). The principle is that a thread is placed in the subcutaneous tissue, elevating the valve area by suspension on bidirectionally orientated cones.^{8,9} Further methods for isthmus corrections are upper lateral cartilage splay sutures, spreader flaps, spreader grafts, and titanium implants.

Twu

Techniques for correcting internal nasal valve deformities could be divided into 2 categories: suture techniques and grafting techniques. Suture suspension procedures like transconjunctival approach, Mitek bone anchor, flaring sutures, and lateral pull-up were considered as minimal invasive maneuvers moving the soft tissue away from the stenotic valvular area. On the other hand, grafting and implant methods modified the structure utilizing cartilaginous grafts and artificial implants, for example, the alar batten graft, butterfly graft, spreader graft, spreader flap, and even composite graft.

For Asian noses with internal nasal valve problems, I usually removed the hypertrophic septal cartilage without destructing the L-shape supporting structure first. The removed septal cartilage could be used for further grafting procedures. Then I will correct the caudal septum, cutting off the excessive hypertrophic inferior part, and fix the straightened caudal septum to the nasal spine area. Through and through cutting among the dorsal septum was then made if necessary. The cut dorsal septum was then secured by using septal sutures and his maneuver was applied to the middle and posterior part of the septum. Submucosal resection of the inferior turbinates was then performed. Spreader grafts will be placed if necessary. Alar batten graft was seldom used unless there existed a dynamic collapse of the alae while inspiration.

WHAT SURGICAL TECHNIQUES DO I USE TO TREAT THE EXTERNAL NASAL VALVE DYSFUNCTION?

Wong

For external nasal valve dysfunction, it is important to make the diagnosis precisely as this distal airway may collapse as a consequence of restriction of flow in the mid-vault. The external valve is an inlet that

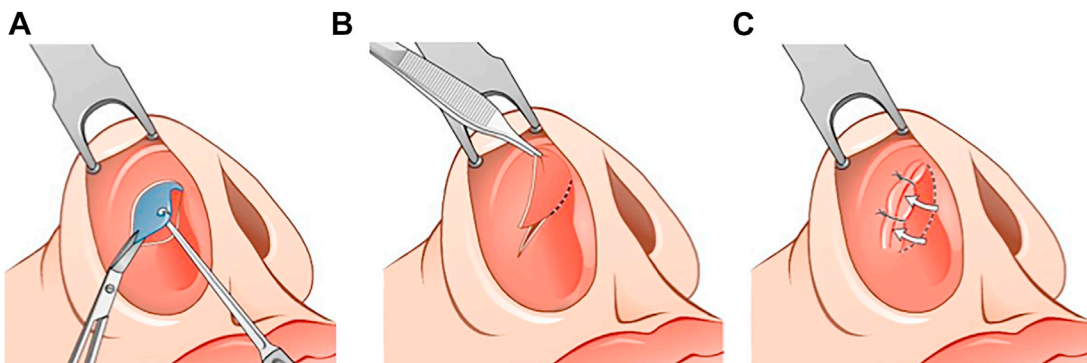


Fig. 1. Lopez Infante technique.

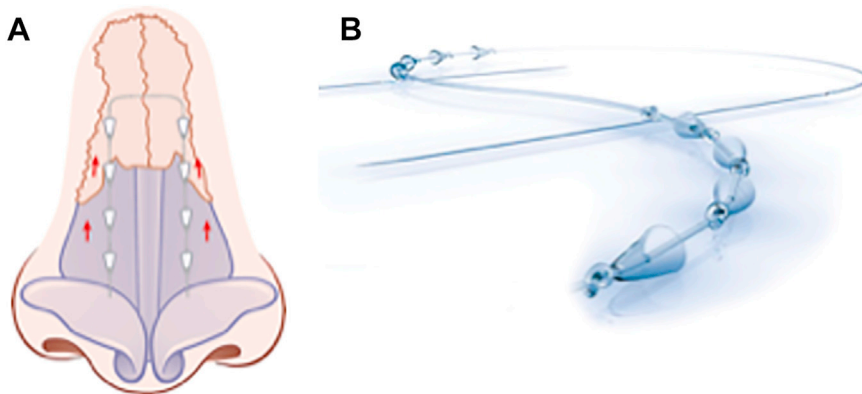


Fig. 2. Nasal valve lift using Silhouette Thread with bidirectional cones.

encompasses what we would call the nostrils/naris and includes the columella, sill, and alar lobule. It extends about 1 cm inwardly and is the inlet for airflow.

There are 2 factors that contribute to airway compromise in this region. First, cross-sectional area of this inlet, as nostril shape varies considerably from a slender and slit-like shape to being circular. Second, pressure drops across this inlet may result in alar lobule collapse. Like the mid-vault, mechanical stability of the alae depends on the constitutive properties of this composite structure. Hence, improve flow can be accomplished by (1) altering the shape of the aperture and/or (2) mechanically stabilizing the alar lobule. To expand the aperture, a number of maneuvers may be performed such as binding the medial crural footplates together, projecting the nasal tip, and/or introducing a simple rim graft to alter alar margin curvature. Mechanical stability of the alar lobule can be improved by either increasing stiffness with placement of a graft or creating dynamic tension. Both methods will reduce lateral displacement. My personally approach largely relies on the creation of tension (lateral crural tensioning, steps delineated in **Fig. 3**) along with the placement of an articulated alar rim graft (steps delineated in **Fig. 4**), and that usually in combination with some degree of lateral crural tensioning.^{10,11} A caveat for lateral crural strut graft placement is that it may reduce airspace in the inlet and thus exacerbate airflow restriction. Narrow, slender noses or narrow nostrils would be a relative contraindication. Use of strut grafts here must be carefully thought out and grafts must be extremely thin, and ideally with convexity facing outward.

Heppt

The surgical concepts of an alar collapse focus mainly on the reinforcement and reconstruction

of the ala but on certain widening too. The most effective techniques rely on the strengthening of the alar sidewall and of the lateral crus by placing cartilage grafts on top or under the lateral crus such as the lateral crural splay graft,¹² the articulated alar rim graft,¹³ and the lateral crural strut graft.¹⁴ Articulated alar rim grafts (**Fig. 5**) are the most frequently performed procedures I execute. They deliver stable and reliable results from both a functional and esthetic point of view. The grafts best taken from the septum are sewed on the surface of the lateral crus and the edges smoothed using a coarse diamond drill. After fixation of the graft, the lateral portion is inserted into an alar pocket. The use of transcutaneous guiding stitches enables the proper placement and prevents displacement in the early postoperative stage.

Twu

The selection of an appropriate surgical treatment of external nasal valve stenosis relies on a comprehensive assessment of the anatomic structures involved and the degree of functional impairment. I divided the external nasal valve dysfunction into 3 categories: deformities of the soft tissue, deformities of the cartilaginous and bony framework, and deformities of the abnormal tissue like scars and contracture.

Suspension sutures might help the simple soft tissue deformities; however, I usually started from correction of the caudal septum. Resection and reposition of the innate septum, as well as replacement or reinforcement of the deformed structures, are essential techniques. The dysfunction of the external nasal valve may need modification of the lower lateral cartilage and/or the columella. Additional grafting like alar batten graft or alar rim graft might be needed.

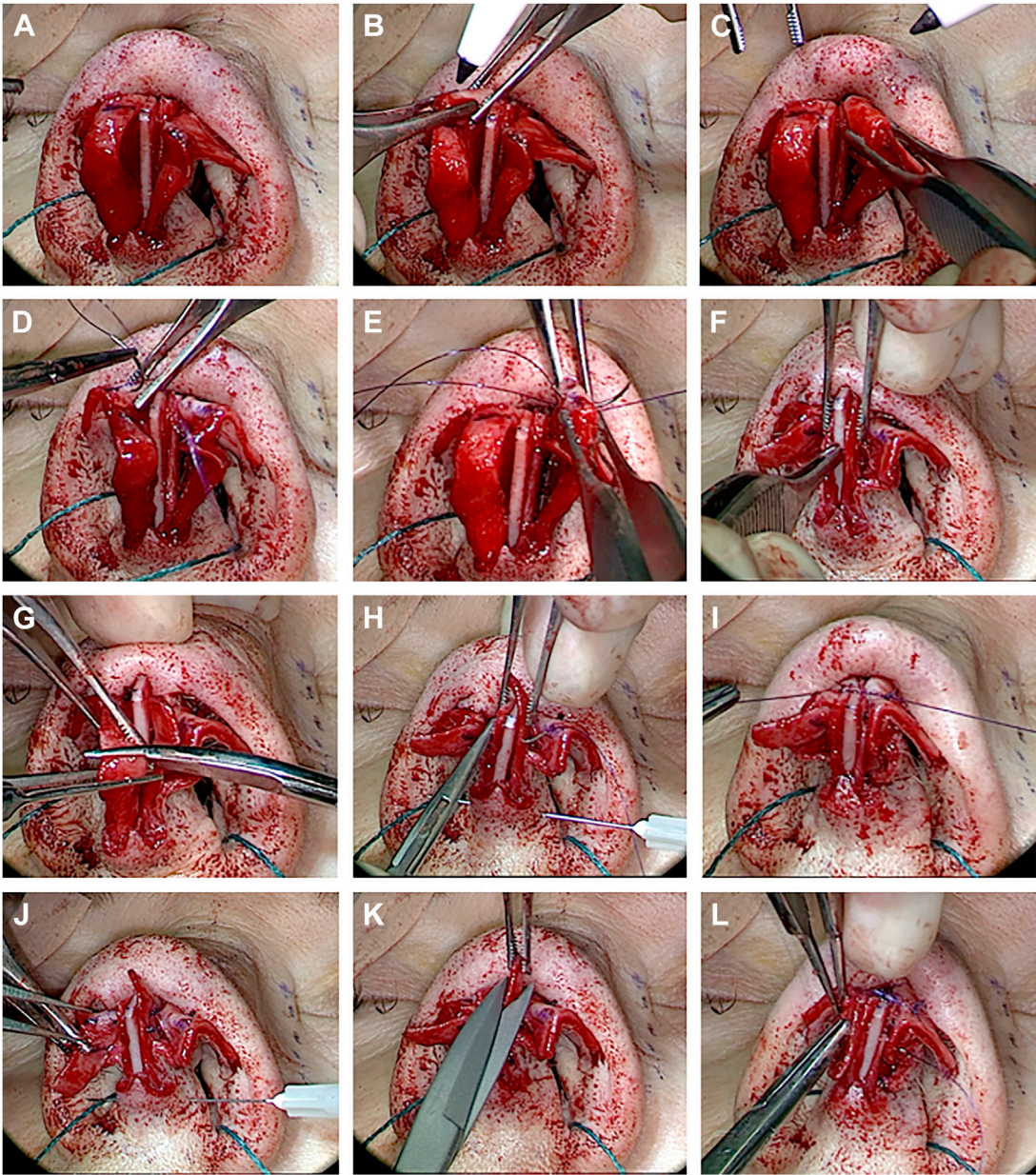


Fig. 3. Lateral crural tensioning (A), the native domes are carefully marked to delineate their position within the lower alar cartilages. Subsequently, (B) the precise amount of lower lateral cartilage recruited to achieve tension and stability across the alar lobule is identified using a Brown-Adson forceps and marked accordingly. (C) Markings are made on the left lower lateral cartilage to guide the surgical procedure. Dome sutures are then meticulously placed on the right side (D) and on the left side in (E). Upon identification of excess medial crura, as depicted in (F), the inferior part of the medial crura is approximated to the septal extension graft with sutures, in anticipation of medial crural division. Subsequent steps, detailed in (G), involve the dissection of excess medial crura from the vestibular skin along the lateral columella, followed by division with a scissor. (H) Illustrates the secure positioning of the medial crura using a hypodermic needle, with additional sutures utilized to anchor the medial crura to the septal extension graft. Concurrently, interdomal sutures are placed to firmly secure the new domes to the septal extension graft, as depicted in (I). A caliper is employed in (J) to accurately measure the amount of cartilage recruited for the procedure. Lastly, (K) demonstrates the removal of excess medial crura from both sides of the incision, followed by their suture fixation (L). Excess medial crural may be overlapped or sectioned.

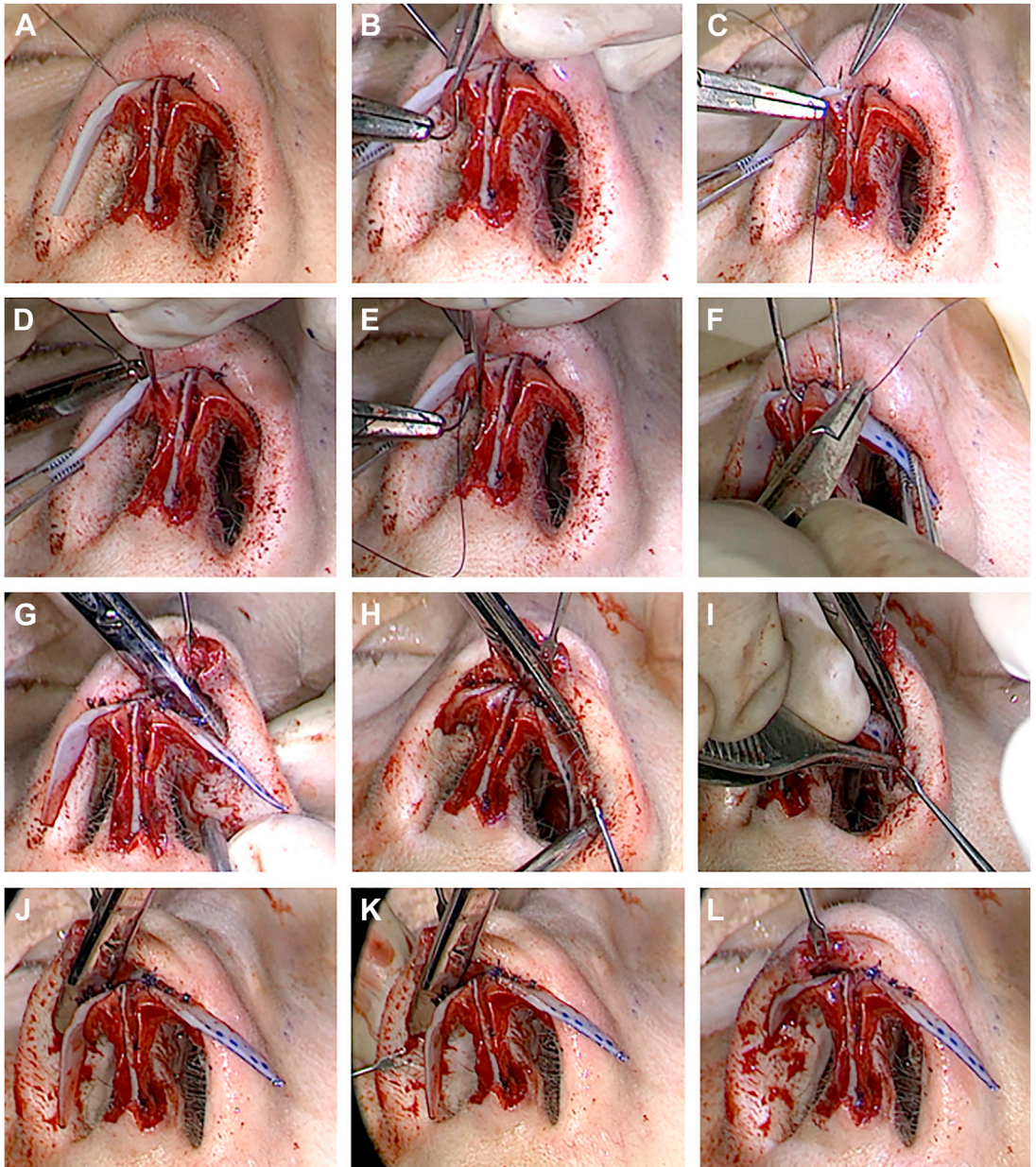


Fig. 4. Articulated alar rim graft placement. (A) A triangular-shaped alar rim graft is meticulously secured to the lower alar cartilage just lateral to the dome using a 30 gauge needle. Suture fixation involves passing a needle through the graft and the lower alar cartilage, ensuring it does not penetrate the vestibular skin. Precision is paramount, necessitating the use of a very fine forceps to guide the process. (B) The first pass of the needle through the cartilage of the graft and then through the cartilage of the lower alar cartilage. (C), The second pass of this suture traverses the margin of the lower alar cartilage and then the graft. It is then tied. The second suture is subsequently placed lateral to the first along the rim graft, traversing both the rim graft and the caudal margin of the lower alar cartilage. It is imperative to avoid piercing the vestibular skin (D). The second pass of this suture once again is placed through the margin of the lower alar cartilage and the graft (E). This step can pose challenges, particularly if the triangular rim graft is relatively narrow or if there is cephalic malposition of the lower alar cartilage. (F) The third suture is placed through the graft, the dome, and, if feasible, the septal extension graft, providing 3 point fixation of the graft in space. With both grafts now secured, (G) demonstrates the use of a sharp iris scissor to create a precise pocket parallel to the alar margin, broader and wider medially and narrowing to a point distally toward the alar base. This pocket provides a trajectory path for placement of the rim

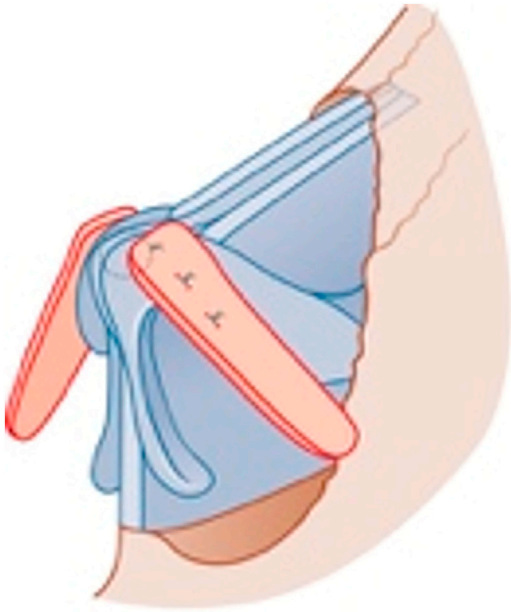


Fig. 5. Articulated alar rim graft.

IN A PURELY COSMETIC RHINOPLASTY, HOW DO YOU PREVENT COMPROMISE OF NASAL FUNCTION?

Wong

I believe every cosmetic rhinoplasty operation is also a functional procedure, especially when part of the operation involves maneuvers that reduce nasal size. This occurs most commonly with dorsal hump reduction. Too often, esthetic rhinoplasty operations are performed without regard for functionality of the airway, and a common reason for performing revision surgery in patients referred to my practice. First and foremost, surgery must create a completely straight septum, and that includes the correction of osseous deformations along the maxillary crest, perpendicular plate, and vomer. Discontinuities in airway topography result in the creation of turbulence. Turbulence leads to pressure drops, and hence reduction in flow velocity. Spurs in particular should not be ignored and must be corrected. I use a piezo

device (Sonopet, Stryker, Kalamazoo, MI) to smooth and contour all bony midline deformities.¹⁵ Second, any maneuver that reduces a dorsal hump could precipitate internal nasal valve collapse, as geometry and by extension pressure and flow change. As I perform a component hump reduction, I consider spreader grafts placement (or auto spreader graft use) in virtually all cases. If there is no hump reduction required, and potential mid-vault issues exist with airflow, I will either split the hump and place spreader grafts or insert a small endonasal-submucosal spreader graft without performing a split.

Tip refinement in cosmetic nasal surgery may also result in a reduction in airflow, particularly esthetic maneuvers cause narrowing at this inlet. Amorphous and boxy-tipped noses may present a challenge, as they are commonly associated with lateral crural recurvature. Many isolated tip suture techniques can exacerbate this recurvature and further compromise nasal airflow. Specific techniques to address recurvature are numerable, and beyond the scope of this study. Finally, turbinate surgery is reasonable in most cases where nasal obstruction is evident preoperatively. I use the NOSE scale as a screening device. There is virtually no downside to performing a conservative turbinate reduction in terms of either a submucous resection of soft tissue and again expands the airway facilitating airflow. My practice is biased in that in an academic center, the vast majority of patients have significant nasal airway obstruction regardless of whether their indication for surgery is primarily cosmetic or functional.

Heppt

With a few exceptions, purely esthetic rhinoplasties such as reduction rhinoplasty or nasal tip corrections run the risk of negatively affecting nasal breathing. One reason for this is that the cross-section of the main nasal cavity is often reduced and dynamic structures such as the nasal valve region are impaired or destroyed. The risk of functional impairment is particularly high if preoperative deviations of the septum,

graft. Prior to this maneuver, it is crucial to inject a small amount of lidocaine and epinephrine at the alar base. Once the pocket has been established, (H) a small skin hook gently retracts the skin soft tissue flap, while a second small double-prong hook pulls the apex of the marginal incision infero-laterally to stretch the incision and facilitate placement of the graft into the precise pocket (H). (I) The index finger on the nondominant hand pushes the entire nasal tip cartilages to the contralateral side, enabling gentle insertion of the tip of the cartilage into the pocket using a Brown-Adson forceps with teeth to grasp the rim graft 3 to 5 mm away from its apex. Similarly, on the right, the pocket is created (J), followed by placement of double-prong skin hooks to provide visualization and traction on the apex of the incision before the graft (K) is carefully positioned into the pocket, as illustrated in (L). The skin flaps are then gently manipulated to facilitate the grafts gliding into the pocket.

turbinates, nasal valve, or chronic diseases of the paranasal sinuses with nasal polyps are overlooked and not addressed. To prevent compromise of nasal function, care must be taken to protect important bony and cartilaginous supporting structures, including muscles and ligaments. Given they are destroyed or no longer present, they should be reconstructed either with sutures or cartilage transplants. Excessive cartilage and bone resections, aggressive mucosal reductions, uncontrolled osteotomies, and dead spaces predisposing to uncontrolled scarring harbor the risk of postoperative functional disorders. Cephalic resections of the lower lateral cartilage edges are particularly critical, as the scroll region is considerably traumatized and nasal valve stenosis can result from scarring.

Twu

In the realm of cosmetic surgery, rhinoplasty stands out as a procedure deeply intertwined with both esthetic desires and functional integrity. The pursuit of enhanced nasal appearance must be carefully balanced against the preservation of nasal functionality, given that any compromise could lead to significant respiratory distress or dysfunction. This balance hinges on a thorough preoperative assessment of the patient's esthetic goals as well as the internal nasal structures.

The surgical technique employed during rhinoplasty plays a pivotal role in ensuring that the functionality of the nose is not jeopardized for cosmetic enhancements. Since contracture and fibrosis might occur after any procedure in rhinoplasty, techniques aimed at preserving or even improving airway flow should be prioritized, such as careful modification rather than aggressive destruction of structural elements not only the cartilages but also the soft tissue and ligaments.

Special care should be taken if we use costal cartilage for septal reconstruction such as septal extension graft or strut. The thickness of the costal cartilage might cause widened septal structure and subsequent airway compromise.

HOW IMPORTANT IS THE RECONSTRUCTION OF THE SCROLL AREA IN YOUR PROCEDURES? DO YOU DO IT ROUTINELY? WHAT TECHNIQUES DO YOU USE?

Wong

The "scroll" is classically described as the region where the upper and lower alar cartilages meet. There are many anatomic relationship anatomic relationships between these 2 cartilages varying from overlapping, end to end, and interdigitation. It is less a contemporary subject of discussion

because of the dominance of the open structure techniques. Scroll anatomy was much more emphasized when endonasal rhinoplasty was dominant. In general, I try not to upset any of the attachments between the upper lateral cartilage and the lower alar cartilage, as I generally do not perform an aggressive cephalic trim. My mainstay approach to correcting lateral crural convexity is a tensioning procedure, though often with a large crura and a convex crura I will do a lateral crural turn under. I generally do not make any attempt to reconstruct the scroll, nor do I reattach connective tissue in the scroll region to the skin soft tissue envelope. I do not believe suture reconstruction has any downside, but at this point, long-term outcomes of these sutures are unknown and results are difficult to gauge.

Heppt

The scroll area can be considered as one of the most important zones of the upper respiratory tract. It is located between the upper and lower lateral cartilages and can be equated with the inner nasal valve (isthmus nasi). As the narrowest part of the upper airway, the inner nasal valve area acts as an accelerator and diffuser of the inhaled air. Due to its location and dynamic construction, the zone is very sensitive to changes. According to Hagen-Poiseuille's law, even small constrictions lead to disproportionately high increases of the resistance.¹⁶ This is the reason why ligaments such as the horizontal and vertical scroll ligament and even fine muscles have to be preserved or reconstructed during every rhinoplasty procedure. The structures can be spared by subperichondrial and pocket-like preparation or rebuilt by suturing or adding cartilage transplants. Spreader grafts¹⁷ and spreader flaps¹⁸ used for reconstruction of the middle vault also have a stabilizing effect on the scroll area, whereas spreader flaps are preferable from the authors point of view due to their better dynamic effect.

Twu

The scroll area plays a significant role in determining the nasal contour and ensuring optimal airflow dynamics. Precise surgical intervention like suture techniques to autologous grafting procedures to restore or enhance its structural integrity and appearance following trauma, congenital defect, or previous surgical modifications is important, because it ensures harmonious integration and reestablishing the delicate balance between maintaining nasal function while improving cosmetic outcomes.

In Asian rhinoplasty, I usually do subperichondrial dissection of the lower lateral cartilage in order to achieve maximal mobilization and then perform extended modification like reposition of the lower lateral cartilages to the neo-causal septum that is reconstructed with septal extension graft. These maneuvers can correct the short nose, under-projected tip, upward rotated tip, and sort of bulbous tip. I will not intend to damage the scroll ligaments, nor reconstruct them.

HOW HAVE YOUR TECHNIQUES IN THIS AREA CHANGED OVER THE LAST 2 YEARS?

Wong

An overwhelming majority of patients with rhinoplasty in my practice have a nasal obstruction score over 75, a fairly morbid degree of nasal airway obstruction. Generally, this indicates that the airway obstruction is multilevel. I have become more aggressive and detailed in terms of correcting the airway in all 4 principal areas—internal nasal valve, external valve, septum, and turbinates. In patients who have very narrow nose is that tend to be thin and steeple-like with very narrow nostrils, I believe performing any maneuver to improve airflow would be justified. A key point lost upon most clinician relates to an understanding of basic fluid mechanics, namely upstream changes alter downstream flow, and vice versa downstream changes alter upstream flow. Study flow when turbulent is complex, and turbulent flow exists in the nose under physiologic conditions. Understanding flow is sublime, but in short, the take-home lesson is that eliminating obstruction anywhere in the nasal airway will create overall better flow. This is particularly crucial in patients with narrow nasal passages, where addressing inferior turbinate issues can be highly beneficial. I am fortunate to collaborate with a skilled rhinologist proficient in medial flap inferior turbinoplasty technique.^{19,20} This procedure involves an aggressive resection of the inferior turbinate, creating a soft tissue flap to cover the raw edges, and removal of the inferior aspect of the turbinate bone. Initially, I had concerns about potential complications such as empty nose syndrome. With several hundred procedures performed, we have not observed any cases of empty nose syndrome. While this is a significant turbinate resection, I believe it is best performed under endoscopic guidance. The outcomes have been exceptionally positive, particularly in patients with narrow nasal passages, and we intend to publish our findings soon.

Another cause of iatrogenic obstruction that is largely preventable is the side-to-side placement

of the septal extension graft. I make every effort to perform an end-to-end graft whenever possible. Straightening the caudal septum should be an objective of every rhinoplasty. Side-to-side grafts would be indicated in airways with an expansive external valve geometry, and a modest deviation of the anterior septal angle to one side. Imprudent design of a side-to-side septal extension graft may block the airway. Our recent publication compared the side-to-side to end-to-end, and so we saw no difference in obstruction, in over 200 patients, but it is important to recognize the indications for each is entirely different.²¹

Finally, what I am doing differently now compared to the previous decade is become increasingly aggressive with achieving stability in the alar lobule. I am aggressive with placing alar rim grafts if I feel at the end of the operation, there is instability or lack of support. It does not take much time or skill to place a classic free-floating fusiform graft along the alar margin, and the benefits are massive.

Heppt

As a rhinoplasty surgeon with a background in otorhinolaryngology, the nasal valve is always of particular importance not only in purely functional but also primarily esthetic procedures. The focus on this region has certainly become even greater in recent years due to the groundbreaking findings of airstream simulations, detailed anatomic studies, and innovative concepts of preservation rhinoplasty.²² Personally, my surgical approach has changed in such a way that in recent years, I have again increasingly favored endonasal techniques, specifically sparing ligamentous structures in the scroll region. In part, this is achieved by pocket-like dissection, in part by completely bypassing the central nasal valve region through a strict medial and lateral approach toward the nasal bridge or lateral nasal flank. If the ligaments of the scroll region have to be severed or are no longer present, I try to either readapt them with sutures or stabilize them by inserting cartilage grafts. In recent years, I have paid particular attention—and this is the most important change in my approach over the last 2 years—to preventing dead space not only in the supratip but also in the scroll region by using sutures.²³ I try to avoid the classic intercartilaginous incision that often destroys the scroll region as well as cephalic trimming of lower lateral cartilages in favor of incisions on the caudal rim of the lower lateral cartilage and suturing techniques for reorientation of the nasal tip and the lateral crura.

Twu

My changes of techniques in rhinoplasty could be divided into 3 categories: the approach, the surgical design, and the material. Rhinoplasty has been approached through either open or closed methods, each with distinct advantages and limitations. The open technique provides surgeons with a better view of nasal structures, facilitating more accurate modifications, whereas the closed technique offers reduced scarring and recovery times. I did more and more endonasal operations in recent years and left open approach only to those suffered from severe damages, multiple revisions, and those without clear preoperative diagnoses. For those who came to me for cosmetic nasal problems, I usually set the surgical goal as correcting the appearance and function at 1 time, since most of the patients had both cosmetic and functional insufficiency. My belief in surgical design is that “less is more.” I tried my best to conduct procedure with minimal invasive ways and also tried to preserve the innate tissue as much as I could. Although preservation rhinoplasty was much promoted in recent years, the Asian noses need much augmentation then destruction, and thus, I seldom follow those popular preservation ways. As for the material, I use only autologous cartilage in the past 2 decades. But complete fixation of the cartilage with sutures was not always easy if I do endonasal approach, for example, fixation of the autologous costal cartilage to the glabella through endonasal incisions like intercartilaginous and marginal incisions. Therefore, I use tissue glue (sealer protein with human fibrinogen) for fixation of the upper most of the inserted costal cartilage.

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