A 20-Year Review of the "New Domes" Technique for Refining the Drooping Nasal Tip

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Objective: To describe in detail a technique to achieve cephalic rotation, projection, and narrowing of the nasal tip, the "new domes" technique.

Design: Retrospective analysis of more than 3000 primary rhinoplasties performed during the last 20 years.

Setting: A private facial plastic surgery practice in Bogota, Colombia.

Intervention: Through an endonasal cartilage delivery approach to the nasal tip, we mold and reorient the alar cartilages with transdomal and interdomal sutures.

Main Outcome Measures: Photographic analysis with nasal and facial measurements taken directly from the patient that allows precise diagnosis and preoperative surgical planning.

Results: The new domes technique creates a more projected, cephalically rotated, narrowed nasal tip. The results are predictable and stable over time, and patient satisfaction is high because of the natural-looking results. Complications such as asymmetries, pinching, or retraction of the tip are rare.

Conclusion: The new domes technique is a conservative, predictable, and stable technique especially applicable for patients with drooped and wide nasal tips to achieve a more projected, rotated, narrowed, and natural appearance.

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NASAL TIP surgery is considered the most interesting and difficult part of rhinoplasty. It obliges the surgeon to perform a detailed presurgical analysis of each patient, analyzing ethnic characteristics, skin thickness, cartilage strength, and nasal tip shape and position. This analysis helps the surgeon determine the patient's nasal anatomy and the precise changes that should be performed surgically. The goal is to obtain a natural-looking result that is proportional to the patient's face and aesthetically attractive as well as stable and durable over time.

In this article, I describe the primary rhinoplasty patient with a drooping nasal tip and normal skin thickness and alar cartilage. For this patient, the nasal tip must be cephalically rotated, projected, and narrowed for aesthetic improvement. I describe the postcartilaginous and precartilaginous (marginal) incisions that allow endonasal access for a cartilage delivery approach, and a conservative, predictable, and stable technique—the "new domes" technique, which places these new domes in a position more lateral to the patient's own domes. We suture the domes together, thus forming an aesthetic triangle that results in a natural-looking nasal tip. This technique is generally complemented with the resection of the vestibular skin of the membranous septum, the resection of the caudal septum and, if necessary, the placement of a columellar strut and columellar-septal fixation suture to secure the results. We believe that this technique avoids the less predictable healing consequences of the vertical dome division techniques.

REDISTRIBUTION OF LOWER LATERAL CARTILAGE

The medial and lateral crura, with the domes being the most projecting part of the lateral crura, constitute the tip cartilages. The shape, position, and strength of these cartilages, as well as skin thickness, determine the appearance of the nasal tip. While shape is influenced by cartilage dimensions, strength, and orientation, the position is influenced by dome location,
crural length, and the adjacent structures. In 1960, Fomon\(^1\) described the use of interdomal and transdomal sutures for narrowing and projecting the nasal tip. To change the position of the nasal tip and obtain cephalic rotation of the tip, we can change the position of the domes and the length of the lateral and medial crura through direct techniques on the cartilage and/or the modification of adjacent structures (ie, by using indirect techniques to change the position of the nasal tip). To further explain the dynamics of these direct techniques, Anderson\(^2\) proposed a very useful concept of a structural tripod. The cartilaginous structure of the nasal tip is considered a tripod in which 2 limbs are the lateral crura, the third limb is the 2 conjoined medial crura, and the apex of the tripod, the nasal domes.

In a drooped nasal tip, considering the lower lateral cartilage, the domes are drooped (ie, counter-rotated and underprojected) owing to long lateral crura and short medial crura. In other words, the distribution of the lower lateral cartilage corresponds to a longer lateral crus and a shorter medial crus than desired. What we do with the new domes technique is redistribute the lower lateral cartilage by moving the dome position to a more lateral location, which creates a shorter lateral crus and a longer medial crus.

In our technique we create new domes by placing transfixion sutures 3 mm or more lateral to the position of the patient’s own domes such that the lateral crura are shortened and the medial crura are lengthened. This increases nasal tip projection and rotation, resolving the problem of the droopy tip. Relating this to the tripod concept, the longer lateral limbs are shortened and the shorter central limbs are lengthened, changing the position of their apex as described.

This conservational technique, which I first reported in 1985,\(^3\) provides the desired aesthetic result while maintaining cartilage continuity, integrity, and support. It avoids using the vertical cartilage division, such as the lateral crural flap, which can cause alar pinching and inspiratory alar collapse, especially in patients with very thin skin.

PREOPERATIVE ANALYSIS

The clinical history, findings from nasal and facial examinations, and a preliminary analysis of the options for nasal and facial aesthetic improvement with frontal and profile views are done during the patient’s first office visit. Computer imaging helps the patient appreciate the nose he or she wishes to have. The preoperative aesthetic analysis at the second visit is crucial to the success of the rhinoplasty. In addition, appropriate laboratory investigations, medical assessment, sinus radiography, computer imaging, and photographic analysis are performed.

The patient’s goals are determined and facial proportions analyzed so that realistic results can be discussed and agreed on. These are traced on the profile photograph for the patient’s approval (Figure 1). This pictorial appreciation of the expected results is of great psychological benefit for patients in accepting their new postoperative appearance.

SURGICAL PROCEDURE

The new domes technique for nasal tip rotation, projection, and narrowing consists of the following 5 steps: (1) marking the new domes; (2) making the necessary post-cartilaginous and precartilaginous (marginal) incisions; (3) obtaining endonasal access with the delivery approach; (4) creating and fixing the new domes; and (5) performing any necessary complementary techniques. A detailed description of these steps follows.

Marking the New Domes

Using violet dye, we draw 2 dots on the nasal skin to demarcate the location of the patient’s own domes (Figure 2A) and vertical lines to identify the level of the new domes (Figure 2C). To aid in defining the level of the new domes, we press on the inferior nasal tip with the index finger, rotating it cephalically to the desired position. This action causes the lower lateral cartilage to redistribute itself, and through the skin it is possible to see the new dome, located more lateral to the patient’s own dome, which corresponds to the apex of the new arch formed by the cartilage as the index finger presses down on it (Figure 2B). In addition, the edges of the lower lateral cartilages are outlined with violet dye also to show the techniques to be performed on them as described by Webster et al.\(^4\) This includes the cephalic cartilage resection, which generally accompanies the use of the new domes technique, hump removal, osteotomies, and any other desired procedures (Figure 2D and E).

Incisions

The postcartilaginous incision, described in 1978,\(^5\) is made at the cephalic border of the lower lateral cartilage as fol-
Figure 2. Intrasurgical marking of the rhinoplasty planning. A, The patient's own domes (2 dots); B, pressing on the nasal tip with the thumb or index finger and rotating it cephalically to the desired position; and C and D, marking completed.

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The precartilaginous (marginal) incision is made at the caudal border of the lower lateral cartilage (Figure 3B) and is performed as follows: The double hook is placed at the edge of the naris while putting pressure with the finger on the alar cartilage, thereby everting and visualizing the vestibular skin. The caudal border of the lower lateral cartilage is identified and an incision made posteriorly to anteriorly following along the lateral crus, and then anteriorly along the caudal medial crus.

Cartilage Delivery

By visualizing the marginal incision with the help of the 10-mm double hook and external pressure with the middle finger over the alar cartilage and using sharp curved iris scissors, the caudal border of the cartilage is dissected. One should dissect superiorly as close as possible to the cartilage of the lateral crus, preserving the fat and subcutaneous tissues adjoined to the nasal skin. Dissection is continued above the domes and the caudal edge of the medial crura. We dissect between the domes and the medial crura until the cartilage is well released between the precartilaginous (marginal) and postcartilaginous incisions, leaving only the distal ends of the lateral and medial crura undissected. This creates a bipediced chondrocutaneous alar flap because the tip cartilages are almost totally released; only their feet remain connected to the underlying tissues. The vestibular skin remains connected to the cartilage. Using a single hook in the vestibular vault, the cartilage is pulled outside of the nasal cavity, providing a direct view of the cartilage and allowing application of the techniques for redistribution of the lower lateral cartilage (Figure 4).

The New Domes

The area for the new domes was initially marked out using marking pen by drawing vertical lines on the skin of the nasal tip. By placing the single hook at the corresponding level in the vestibular vault, the cartilages are delivered and we are able to observe and corroborate the place to locate the new dome, usually several millimeters lateral to the patient's own dome.

Cephalic Resection of the Alar Cartilage. Several authors have described this procedure. We measure the width of the cartilage at the level planned for the new dome. If the width is greater than 5 mm, we perform a
Figure 3. Incisions for the nasal tip surgery. A, The postcartilaginous incision; B, the precartilaginous or marginal incision; and C, illustration of the 2 incisions.

conservative cephalic excision of the additional cartilage, leaving at least 5 mm width at this new dome level. The vestibular skin is not excised. We continue this cephalic excision laterally, leaving the lateral crus with a width of 7 mm at its medial half, without extending the excision to the distal posterior half of the lateral crus (Figure 5A). This conservative procedure preserves sufficient cartilage to ensure tip support and avoids late postoperative complications such as bossae.

Transdomal Sutures. With the cephalic cartilage resection completed, we measure the distance between the new dome and the patient’s own dome, which corresponds to the amount of lateralization required. Using polyglactin 5-0 suture (Vicryl; Ethicon, Somerville, NJ), we place
Figure 6. The complementary techniques. A, Caudal septum shortening; B, vestibular skin reduction; C, columellar strut placement and fixation; and D, columellar-septal fixation. Note the tip projection achieved.

a double transfixion suture 2 or 3 mm from the level of the new dome (Figure 5B). From the medial toward the lateral face, we pass the needle through the new dome, returning to the same level but with a 2- or 3-mm separation from the lateral to the medial side, knotting and taking another suture, to make it double. The tension of the transfixion sutures must be controlled without tightening the suture so much that the lateral and the medial sides of the domal cartilage come together. This maintains the natural arch of the cartilage at the level of the new dome. We perform this procedure with the right alar cartilage first and then the left.

The cartilages are replaced from both sides into the nasal cavities at their original positions to check the results obtained. Specifically, the new position of the nasal tip and its degree of rotation, shape, and symmetry are assessed. If the new domes are not located at the same level, one of them must be corrected. The initial transfixion suture is removed and relocated. This correction is performed as many times as necessary until the new domes are symmetrical and in the desired position. An additional transfixion suture of polypropylene 6-0 (Prolene; Ethicon) ensures the stability of the new domes.

Interdomal Sutures. With the cartilage delivery approach for cartilage release, the dissection between the domes and the medial crura interrupts the ligaments between them. These supports must be reconstructed using sutures between the domes and the medial crura to secure their structural integrity and overall tip symmetry. We use polyglactin 5-0 sutures, beginning with a suture between the cephalic edges of the medial crura 2 mm from the domes, followed by a suture between the caudal edges of those crura 6 or 8 mm from the domes (Figure 5D). These interdomal sutures I described in 1981. In this way, we reconstruct the cartilage in its ideal anatomic position and create a triangle formed by the caudal edges of the new domes separated from each other by 6 or 8 mm, and the caudal edges of the medial crura are connected to each other 6 or 8 mm below the new domes. This is how the aesthetic triangle described by Sheen10 is achieved, and it provides the corresponding external highlights that give the tip a natural appearance.

We replace the cartilage into the nasal vestibule and reconfirm the position and symmetry of the nasal tip. The marginal incision is closed with polyglactin 5-0 sutures. The nasal tip is now cephalically rotated, more projected, and narrowed.
Complementary Techniques

Based on the new position of the nasal tip and the columella, we analyze the caudal septum and the membranous septum for redundancy. If redundancy is present, resection is performed to secure the new nasal tip position and the proper degree of columellar show (4 mm). To provide greater strength to the medial crura and nasal tip, we place a cartilaginous strut between the medial crura. We also place columellar-septal fixation sutures to at least maintain, or possibly increase, nasal tip projection.

Caudal Septum Shortening.\(^1,2\) Pushing the columella upwards into the desired position with a finger, we observe whether the caudal septum is long. If so, we resect the excess caudal septum so that it has an anatomically normal curvature (Figure 6A). The ideal amount of columellar show is usually about 4 mm from the alar margin to the inferior columella.

Vestibular Skin Reduction.\(^3\) Pushing the columella into the desired position with a finger replaces the vestibular skin to its original position, and we can observe the amount of excess skin. This is excised in a triangular shape, usually 2 or 3 mm, or wider for very long drooped noses (Figure 6B).

Columellar Strut Placement and Fixation. The importance of the cartilaginous strut for tip support was described by Fomon\(^4\) and emphasized by Anderson.\(^5\) We use an autologous graft from septal cartilage about 2 mm thick, 4 mm wide, and 15 to 20 mm long. It is molded with an anterior convex curvature and is inserted as follows: Dissection is performed through the precartilaginous (marginal) incision of the columella to form a tunnel between the medial crura without separating them at their posterior edges. The cartilage strut is placed inside the tunnel so that its distal end does not extend beyond the distal medial crura, and the convex edge of the strut is placed at the same level as the anterior edges of the medial crura. The anterior end of the cartilage strut is located 6 or 8 mm from the domes. It is fixed with polyglactin 5-0 sutures between the medial crura (Figure 6C). The length and strength of the medial crura dictate the length and width of the columellar strut—the weaker the medial crura are, the larger and stronger the columellar strut should be.

Columellar-Septal Fixation. This suture was described by Fomon\(^4\) and Berman.\(^7\) Our technique is as follows: With polypropylene 5-0, we place 2 sutures (Figure 6D). The first is placed at the posterior end of the medial crura. The suture is begun through the skin from the right side superiorly to inferiorty, and from inside to outside. The needle is reintroduced through the same point of exit and transfixes the skin from right to left, passing through the right skin, right crus, columellar strut, the left crus, and the left skin so that it comes out at the same level as its entry. Once again, the suture is placed through the same point of exit, passing through the left skin from outside to inside and from inferiorly to superiorly, with the knot being made behind the columella.

The second suture is placed at the middle of the columella in the same manner and, after knotting it without cutting, the suture is passed through the caudal septal edge 3 mm or more anteriorly, where it is knotted so that the columella slides anteriorly over the caudal septum. This increases projection and fixation of the medial crura and the nasal tip, as desired. It is important to bear in mind that nasal tip projection decreases postoperatively by 2 or 3 mm as edema resolves. Therefore, the intrasurgical position of the nasal tip must be projected 2 or 3 mm more than the planned position for the nasal tip.
RESULTS

We have used the new domes technique on more than 3000 patients over 20 years and found it a reliable method to precisely achieve increased projection and cephalic rotation of the nasal tip (Figure 7). Our results have been predictable and stable over this long follow-up period. Patient satisfaction has been almost 100% in terms of nasal tip placement and in maintaining a natural appearance. We believe this is due to our ability to precisely set the tip position and to maintain its stability by maintaining crural continuity.

The symmetrical and exact positioning of the new domes is of prime importance to achieve the exact cephalic rotation desired and to avoid deviation or asymmetry of the nasal tip. If we are not satisfied after using the technique, we replace the transdomal and interdomal sutures until we are fully satisfied. It is important to maintain a calm demeanor since this surgical procedure is not simple, and it is preferable to obtain the necessary corrections during the initial surgery rather than be faced with revision surgery.

It is also crucial to analyze each patient accurately to determine the need for the complementary techniques that stabilize the surgical results. Resection of the caudal septum and vestibular skin may be necessary to improve a hanging columella. A columellar strut can improve the strength and length of the patient’s medial crura, and the columellar-septal fixation sutures can help to sustain or increase nasal tip projection.

We keep in mind that the intrasurgical estimate of nasal tip projection should be about 2 or 3 mm greater than the final planned projection, since tip projection diminishes postoperatively by approximately that amount. Through our postcartilaginous incision, we have not seen any valvular disturbance or any obstructive scarring at the nasal valve level. Using the new domes technique, we have not found any alar retraction or pinching, nor has there been alar inspiratory collapse because we preserve the continuity and resistance of the alar cartilage.

In conclusion, drooped nasal tips pose a challenge to the surgeon, requiring accurate preoperative analysis and precise surgical techniques to achieve nasal tip positioning in the desired and appropriate position for each patient’s face. The new domes technique allows us to obtain a nasal tip that is more projected, cephalically rotated, and narrowed through the use of a suture technique that preserves the integrity and continuity of the lower lateral cartilage. This creates a tip that is natural in appearance with no risk of cartilage pinching or retraction, the telltale signs of aesthetically undesirable adverse effects of surgery.

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