

## REVIEW ARTICLE

# Repair of Surgical Defects of the Nasal Pyramid

J Romaní and M Yébenes

Servicio de Dermatología, Hospital Parc Taulí, Sabadell, Barcelona, Spain

**Abstract.** The nose is an area commonly involved in dermatological surgery. Basal cell and squamous cell carcinoma frequently affect the nasal appendix and its adjacent structures. There is a broad repertoire of surgical techniques for the reconstruction of this area, including direct closure, local and distant flaps, and grafts. Small surgical defects may be repaired by direct closure or second intention healing but local flaps and skin grafts from appropriate donor sites are frequently required after excision of tumors. Flaps have substantial advantages over grafts because they have their own blood supply and their viability does not depend entirely on the vascular bed of the surgical defect. Flaps offer similar skin in terms of color, texture and photoaging. Local flaps are essentially classified in several types: advancement, rotation and transposition. In this review we mention and graphically illustrate the reconstruction procedures from our own experience.

**Key words:** nose, surgery, cutaneous, flap, graft.

## RESOLUCIÓN DE LOS DEFECTOS QUIRÚRGICOS DE LA PIRÁMIDE NASAL

**Resumen.** La nariz es una zona frecuentemente implicada en la cirugía dermatológica. El apéndice nasal y sus estructuras vecinas son zonas de asiento muy frecuentes del carcinoma basocelular y escamoso. Existe un amplio repertorio de técnicas quirúrgicas para la reconstrucción de esta área, incluyendo el cierre directo, los colgajos locales y a distancia y los injertos.

Los defectos quirúrgicos pequeños pueden solucionarse con el cierre directo o la curación por segunda intención, pero con frecuencia la extirpación de tumores requiere el uso de los colgajos locales y de injertos cutáneos de una zona donante adecuada. Los colgajos ofrecen sustanciales ventajas sobre los injertos, porque poseen un aporte propio de sangre y no dependen por completo del lecho vascular del defecto quirúrgico para su viabilidad. Ofrecen una piel similar en términos de color, textura y fotoenvejecimiento. Los colgajos locales se clasifican en diversos tipos: avance, rotación y transposición fundamentalmente.

En esta revisión, mencionaremos e ilustraremos gráficamente los procedimientos de reconstrucción a partir de nuestra propia experiencia.

**Palabras clave:** nariz, cirugía, cutánea, colgajo, injerto.

## Introduction

Skin tumors, especially basal cell carcinoma, are frequently found on the nose. Consequently, repair of surgical defects in the nasal pyramid, either following standard surgery or Mohs micrographic surgery, is a challenge that must be faced by any dermatologist. At first sight, dermatologic surgery of the nasal area may appear complex, but it is surprisingly yielding, and the reconstruction of an apparently extensive or complicated defect can be straightforward if

we take into account the esthetic units, expression lines, and nearby tissue donor sites. The skin of the nose is quite inelastic, but the adjacent areas (glabella, nasolabial folds) tend to have loose, elastic skin, and represent excellent sources of skin flaps. Despite being an anatomically peripheral area, its abundant and redundant vascularization makes reconstruction extremely viable.

It is important to take into account the esthetic units and tension lines and avoid visible scars and especially deformities that lead to asymmetry. Reconstruction of the nasal alae and nostrils must maintain airway patency.

In this review, we will try to avoid an academic and theoretical approach in order to focus more on the practical aspects of repairing a surgical defect of the nose. We will attempt to address common problems such as how to cover a defect, where to get the skin from, and how to make sure

Correspondence:

Jorge Romaní de Gabriel.  
Consorci Sanitari Parc Taulí.  
Parc Taulí, s/n. 08208 Sabadell. Barcelona. Spain  
xurxoromani@hotmail.com

Manuscript accepted for publication March 7, 2007.

that it is symmetrical and there are no scars or deformities. To this end, we will describe the techniques that can be used for each esthetic unit of the nose.

It would be impossible to address all of the possibilities available for a given surgical defect. Each dermatologist may employ a different option, or even the same dermatologist may use one or another according to the individual patient, the moment in time, or the availability of time and space. We will try to mention as many options as possible and illustrate some of them with diagrams and figures based on our own experience.

## Methods of Reconstruction

In the repair of surgical defects, the following options should always be chosen in order of preference:

1. Simple excision
2. Flap closure
3. Second-intention healing
4. Grafting

### Simple Excision

In the nasal region, simple excision should be performed taking into account the expression lines. These can be easily determined by asking patients to wrinkle their nose.<sup>1</sup> In general, an easy rule to remember is that incisions should be transverse at the root, vertical in the dorsum, and oblique in the lateral walls. The furrows that delimit the esthetic units, such as the alar or nasolabial creases, can also be followed (Figure 1). As the area is not very elastic, a relatively long ellipse should be created around the defect with a 3:1 ratio of length to diameter of the defect (Figure 2). This prevents the formation of dog ears, which in the nose can generate a very unsightly result. Simple excision is easy to perform, the resulting scar can easily pass unnoticed, and in many cases can even contribute to improving the general appearance of the nose.<sup>2,3</sup> For instance, in the case of a loose or hanging nasal tip, broad nostrils, or rhinophyma, common in older patients, a reduction of the tissue with elliptical excision may be esthetically advantageous.<sup>2,3</sup>

### Flap

In general, it can be stated that a local flap is the preferred option for a defect that cannot be resolved by direct closure rather than closure by second-intention healing or grafts.<sup>4,5</sup> Use of a flap can be a rapid solution that reduces the length of the intervention compared with grafts, is relatively simple, and produces excellent cosmetic results.

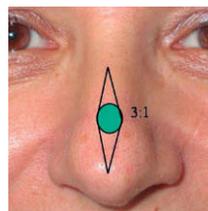
We will focus on the description of those local flaps that are generally used in dermatology. These include transposition or advancement flaps, which involve direct advancement without lateral movement. This technique includes subcutaneous or island pedicle flaps,<sup>6,7</sup> which are very useful and based on a simple principle: while the epidermis and dermis are not very elastic, the subcutaneous tissue is. It is possible to take a subcutaneous pedicle flap and mobilize it laterally with good results (Figures 3 and 4). The flap is preferentially vascularized via the pedicle, meaning that it is rarely not viable. They are very useful for defects of the lateral wall, in which the flap is taken as a triangle from the melolabial area with the defect remaining hidden in the fold.

Rotation flaps turn on a point towards the adjacent defect without passing over healthy skin. Transposition flaps move or rotate towards the surgical defect passing over healthy skin.

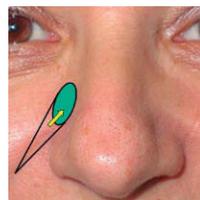
The most common complication with flaps is the trapdoor deformity,<sup>8</sup> which consists of a very unsightly and difficult-to-correct increase in the volume of the flap caused by vascular obstruction in the area. It is generally an early complication that appears 3 to 6 weeks after the intervention. It is not always prevented by stretching the pedicle to its limit, and this can also lead to failure of the flap. It appears to be more common in transposition flaps in which the movement goes from bottom to top, for instance, in



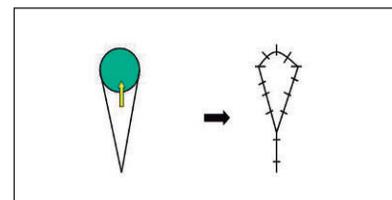
**Figure 1.** Guide for direct excision in the nasal pyramid.



**Figure 2.** Simple excision. Ratio of length to width, 3:1.



**Figure 3.** Subcutaneous island pedicle flap.



**Figure 4.** Subcutaneous island pedicle flap.

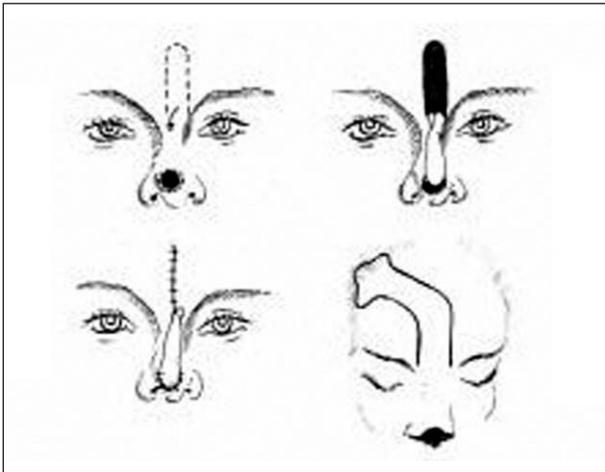


Figure 5. Median forehead flap. Taken from Brufau Redondo.<sup>1</sup>

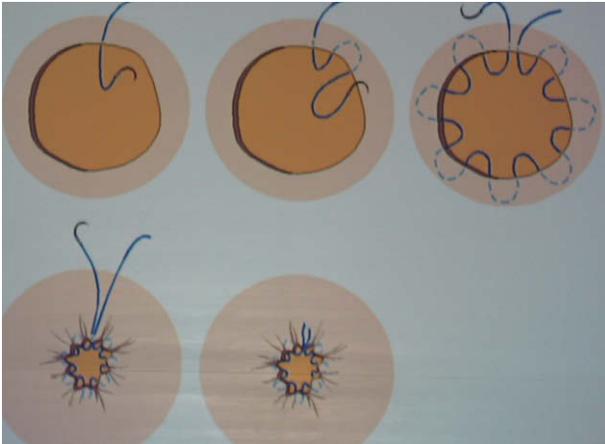


Figure 6. Purse-string suture.

melolabial flaps used to repair defects in the lateral wall or the nasal ala. A good way to prevent this complication is to conveniently thin the skin of the flap, adjust it to the limits of the defect without the presence of redundant skin, and have available a sufficiently large and deep bed to house the lobe of the flap. If the trapdoor deformity is established, it can be treated secondarily by dermabrasion or laser treatment.<sup>9</sup>

In terms of distant flaps, the most widely used is the median forehead flap (Figure 5). It is a staged flap that can be used to resolve large defects that encompass the tip, columella, and nasal alae, for which other reconstructive options would be unlikely to be effective. The main drawback is the requirement to perform the operation in 2 stages, which is unpleasant for the patient.

A rectangular flap is obtained from the medial forehead region and the glabella, which is well vascularized via the supratrochlear artery. If the defect includes the nasal alae

and columella, the flap can even be extended as far as the hairline in the temporal forehead area. The flap is rotated on itself 180 degrees and the distal part is sutured to the defect. The resulting defect in the forehead and glabellar region can be sutured directly, covered with a graft, or even brought together and allowed to close by second-intention healing. The pedicle of the flap should be left covered with gauze soaked in Vaseline for 3 weeks.

## Second-Intention Healing

It is possible to leave small surgical defects (of up to 7-8 mm in diameter and 4-5 mm deep) to undergo second-intention healing, and the results can be esthetically correct. However, the healed area usually remains depressed, making it better to leave this possibility for concave areas such as the alar crease. It is recommended that when opting for second-intention healing, the defect be located more than 5 to 6 mm from the mobile alar margin to avoid causing asymmetry or alar dysfunction as a result of retraction.

One way to heal by second intention is based on the use of a purse-string suture (Figure 6), in which the surgical defect is reduced to a small central area. This is a possible solution, for example, in the lateral wall.

## Grafts

### Full-Thickness Skin Graft

Reconstruction using grafts should always be considered a last resort, since the esthetic results that are achieved are inferior to those obtained with simple excision or flaps.<sup>10</sup> However, grafting is an easy technique to plan and perform, it can be used for any size of defect, does not require closure of the defect under tension, and does not require the complex design associated with flaps. An advantage over the use of flaps is that local recurrence of tumors is easier to observe and record spatially, since flaps involve transposition of areas of skin, and that can sometimes hinder the monitoring of recurrence.

As a rule, full-thickness skin grafts are used, since split-thickness grafts are usually insufficient to obtain good cosmetic results.

The success of the graft depends in particular on the quality of the recipient bed. Consequently, electrocautery should be avoided. If the defect compromised the cartilage, attempts should be made to preserve the perichondrium in the bed to ensure viability.

The nasal tip and adjacent structures tend to be the areas of the nose in which reconstruction using grafts is most often employed. As the skin in those areas is very thick and sebaceous, especially in older men, grafts should be taken from areas that are similar in color, texture, light

exposure, and hairiness.<sup>9</sup> The most recommendable are the area of the nasolabial crease, the conchal bowl, and the periauricular area, especially the preauricular and retroauricular areas, which have quite thick, seborrheic skin without hair growth (if the preauricular area does not include the sideburn). Other areas that are typically sources of skin for grafts, such as the clavicular or lateral cervical areas should be considered second-line options. They have the disadvantage that their lack of thickness and substance cause the graft to remain depressed, although their theoretical advantage lies in their being photoaged areas that can be highly cosmetic in the nasal area since they do not undergo color variations in their new location.

When the surgical defect includes part of an esthetic unit, it may be advisable to extend the excision margin in order to graft skin over the entire unit. In addition, due to the retraction that normally occurs in the grafts, it is advisable to avoid tension in the sutures and to employ a generous graft.

### Insertion of Cartilage

In some cases, when the surgical defect involves loss of nasal cartilage, it may be necessary for the graft to include cartilaginous material to provide support and prevent collapse during breathing. This situation is typical in the nasal alae. If it lacks rigid support, a surgical defect in the nostrils can cause vestibular stenosis. The solutions are to introduce a fragment of cartilage or perform a composite graft of skin and cartilage. If the excision also involves loss of nasal mucosa, the preferred option is a skin–cartilage–skin graft.<sup>1</sup>

The sources of cartilage and skin for composite grafts are usually the ear folds, the helix, the antihelix, the concha auriculae, and the tragus (Figure 7). For defects of the nasal septum the usual source is the cartilage of the eighth rib.

Insertion of a fragment of cartilage can be performed by suturing it directly to the base of the defect (Figure 8D) or obtaining a long rectangular fragment (usually from the helix or the posterior of the concha) and inserting it into the surgical wound, creating pockets in both margins (Figure 9). This option is especially useful to give substance to the alar region. In addition, it is possible to take advantage of the natural curvature of the auricular cartilage to create a natural concavity that maintains the vestibule patent and prevents retraction of the graft. In many cases, the viability of the cartilage introduced in this way is doubtful, but it appears to be unimportant. The mere presence of the rigid framework that it provides during the initial stages of healing appears to be sufficient to prevent retraction of the nasal alae.

The full-thickness skin graft is placed over the inserted



**Figure 7.** Areas of the ear used as donors for composite grafts.

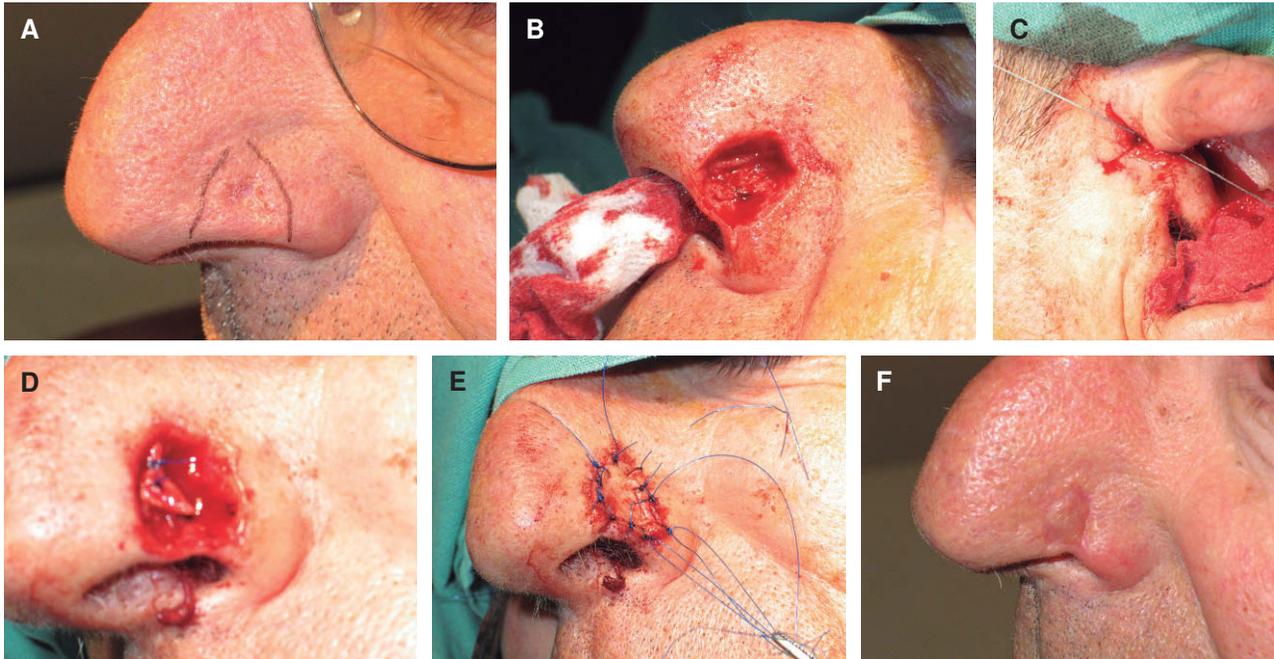
cartilage, and the final esthetic result is very acceptable (Figure 8 A-F).

### Composite Graft

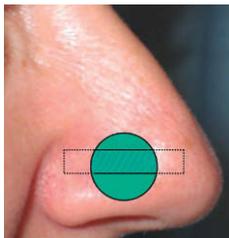
In many cases, when there is a full-thickness defect that includes skin, cartilage, and mucosa, the solution is to employ a composite graft using tissue from the donor areas mentioned. Ideally, the best area is an ear fold that can be grafted with the curvature adapted to the excised nostril. A triangular graft is situated with the convex surface facing outwards and then sutured, firstly the internal layer to the nasal mucosa, with an absorbable material, and then the external layer to the skin with silk or a monofilament suture. It is not necessary to suture the cartilage. An interesting variation involves obtaining the composite graft from the root of the helix, with 2 tongues of cartilage at the ends that are inserted in pockets created in the borders of the donor area, as described earlier for the insertion of cartilage alone (Figure 10). The increased area of contact between the defect and the graft improves reanastomosis and prognosis.

The graft should be treated with care, since the viability is highly compromised due to its being a graft that can only be revascularized by bridging from the borders. Luckily, the nostrils have a good blood supply and success is possible if the graft is not too large. There is little agreement regarding the size limit, and although some authors have predicted a maximum tolerated graft of around 2.5 cm, the risk of necrosis is high; consequently, we would recommend that a graft of 1.5 cm not be exceeded in any case and that more complex reconstruction options are sought for larger defects. A good technique to increase the viability of the graft is to immerse it in ice-cold saline and apply ice to the area for 3 to 4 days after surgery in order to reduce its nutritional requirements. Another useful technique is to perform a beveled surgical incision in both the host tissue and the graft to increase the surface area in contact between them and facilitate microvascular anastomosis.

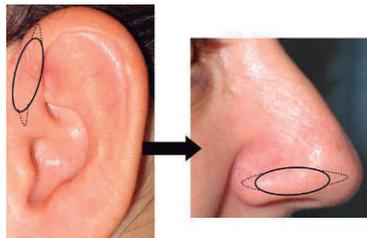
An occlusive pressure dressing should not be applied as



**Figure 8.** Basal cell carcinoma of the nasal ala. Repair of the surgical defect with insertion of cartilage and skin graft taken from the antihelix. A. Appearance of the tumor. B. Surgical defect following excision. C. Star-shaped closure of the donor region of the antihelix. D. Insertion and suturing of a triangle of cartilage to the base of the defect. E. Suturing of the graft. F. Esthetic result 2 months after the intervention.



**Figure 9.** Insertion of cartilage in pockets at the edges of the incision.



**Figure 10.** Composite graft of skin and cartilage inserted in pockets at the edges of the incision.

## Esthetic Subunits of the Nose and Reconstruction Techniques for Each of Them

The esthetic units to be considered for the nose are the nasal root (in many cases this area is affected by tumors of the medial canthus of the eye, an area predisposed to basal cell carcinoma), the nasal dorsum, the lateral walls, the nasal tip, and the nasal alae.

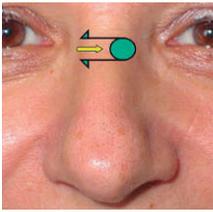
### Nasal Root and Medial Canthus of the Eye

The area of the nasal root has the glabella nearby as a source of skin, and this greatly facilitates reconstruction. However, many tumors occurring in the root also affect a complex area, namely, the medial canthus of the eye. We will not discuss here how to reconstruct the eyelid or ocular structures, but we will consider how to correctly preserve the function and appearance of the region around the nasal pyramid.

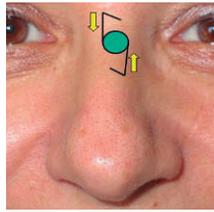
Direct excision can be sufficient in the case of small defects, but it must be held in mind that the lateral root and the medial canthus of the eye can create adhesions due to retraction that can ultimately lead to discomfort when opening the eye. Various solutions exist to prevent this problem, in particular the use of flaps.

is commonly the case, and it is preferable to only cover the nasal vestibule with a Vaseline gauze and to apply an antibiotic cream over the graft. This also allows the usual changes in color to be observed.<sup>8</sup> Once the graft is placed, it displays a pallid coloration. After 6 hours the color is a pale pink as a result of the first vascular anastomosis. At 12 to 24 hours, the tone is cyanotic and there is an increase in volume as a result of venous stasis. At 3 to 7 days, the graft regains a pink coloration, which is indicative of graft survival.

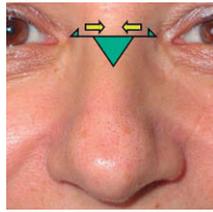
Prophylactic antibiotics are recommended whenever grafts are performed in the area of the nasal vestibule, due to the high level of bacterial colonization of that area.



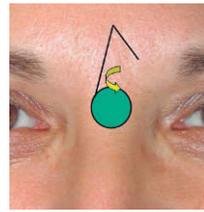
**Figure 11.** Sliding flap.



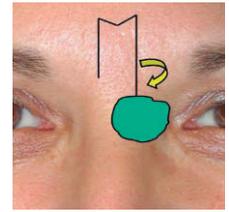
**Figure 12.** Double hatchet flap.



**Figure 13.** V-T Flap



**Figure 14.** Glabellar rotation flap.



**Figure 15.** Glabellar transposition flap.



**Figure 16.** Basal cell carcinoma of the nasal root. Repair of the surgical defect with a glabellar rotation flap. A. Initial appearance of the tumor. B. Result of the flap procedure. C. Appearance following suture removal.

Small defects can be reduced with a purse string (Figure 6) and/or left to heal by second intention, with acceptable results.

One possible option is the use of a horizontal sliding flap (Figure 11), double hatchet flap (Figure 12), V-T flap (Figure 13), and in particular, the glabellar rotation (Figure 14) or transposition (Figure 15) flap, which are very useful for reconstruction of this area and the medial canthus of the eye. The skin of the glabella is somewhat thicker than that of the nasal root and the thickness of the flap should be reduced so that it fits correctly. If the interbrow area is very hairy, transposition of that tissue to the nasal area can be unsightly and should be avoided. Some authors have studied the usefulness of pulsed light to eliminate hair from flaps of this type.<sup>9</sup> An example of a glabellar rotation flap is shown in Figure 16 A-C.

## Nasal Dorsum

### V-T Flap

Perhaps the most commonly used option after direct closure is the V-T flap (Figure 13). The skin incision is made in the form of a V, the flap is mobilized towards the pedicle, and the external surgical borders are advanced medially to be sutured in the form of a Y.

### Triangular or Rectangular Advancement Flap

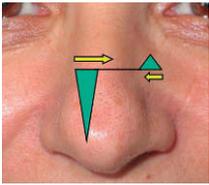
This type of flap can be rectangular or triangular and is mobilized in the direction of the free border (Figure 17).

### Advancement-Rotation Plasty

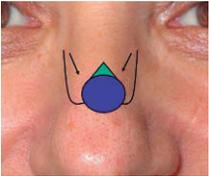
These involve semicircular flaps that rotate laterally<sup>10</sup> (Figure 18). They are used to cover triangular defects. Occasionally, it may be necessary to perform a small incision or resection of a triangle of skin close to the pedicle (Buw's triangle) to relieve the tension generated by wound closure.

### Extended Glabellar or Pan-nasal Flap (Rieger or Modified Gillies Heminasal or Dorsonasal Flap) (Figure 19)

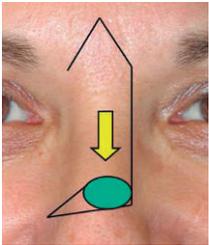
This flap is based on the principle of advancement in V-Y in the glabellar region and can therefore be considered as an extended glabellar flap. It allows coverage of large lesions of the nasal tip as well as defects of the dorsum. It is necessary to lift all the skin from the nose down to the muscle in the plane lying over the perichondrium/periosteum. The edge of the flap extends to the glabellar region and ends in an inverted V, allowing surplus tissue from that region to be transferred towards the defect, which is generally located at the tip. Adjustment requires excision of the dog's ear created



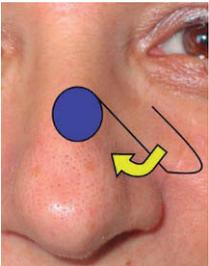
**Figure 17.** Triangular advancement flap.



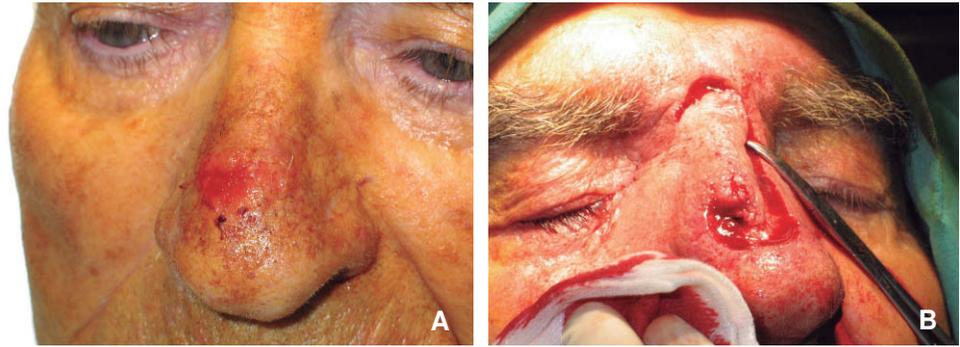
**Figure 18.** Advancement-rotation plasty



**Figure 19.** Rieger flap.



**Figure 21.** Melolabial flap.



**Figure 20.** Apocrine carcinoma excised in the nasal dorsum. A. Initial appearance of the tumor. B and C. Rieger flap procedure. D. Appearance following removal of half the sutures.



**Figure 22.** A. Trichoblastoma in the nasal dorsum. B. Closure of the defect using a melolabial flap. Appearance following suture removal. C. Appearance 2 months after the intervention.

on the other side of the flap incision. The descent of the flap and the upper glabellar region allows direct closure. A clinical example is shown in Figure 20 A-D.

### **Nasolabial Dermal or Melolabial Flap (Figures 21 and 22 A-C)**

This type of flap was initially described by Dieffenbach for the repair of partial defects of the nasal alae. However, it is not usually sufficient to cover the complete units of the dorsum or nasal tip. It is based on branches of the facial artery, allowing them to be superiorly based or inferiorly

based, including the tissue located dorsolaterally to the nasolabial crease.<sup>11</sup> Elevation of the flap is usually performed in the medial subcutaneous plane, taking care to respect the subdermal plexus. It is considered the most widely used flap in this area thanks to the characteristics of good mobility and the fact that it allows closure of the secondary defect by direct suturing. Although this flap was only used in skin coverage, it allows reconstruction of the full thickness via simultaneous insertion of cartilage grafts. In this way, it is possible to reestablish both the internal and external parts of the border of the nasal ala and to prevent proximal retraction to create a normal contour. Another advantage

is the possibility of performing it as an island flap. The main disadvantage is the frequent formation of a trapdoor deformity.

### Frontonasal Flap

The frontonasal flap is a distant axial flap with a blood supply from the supratrochlear artery. It has been explained in detail previously.

### Median Forehead Flap

The flap is taken from the central area of the forehead, includes the muscular plane, and has a pedicle located in the glabellar region. It is used for coverage and reconstruction of the nose, the periorbital area, and the eyelids. The donor region closes perfectly by second intention healing.

## Lateral Walls

### Rhomboid Flaps (Figure 23)

These flaps are useful for the closure of defects in the lateral walls, dorsum, and small defects in the nasal tip. They can be designed in 4 directions and the choice is based on the amount of surrounding tissue. Thus, in the lateral wall of the nose a flap should be chosen that has a base or pedicle directed downwards and laterally towards the cheek. They

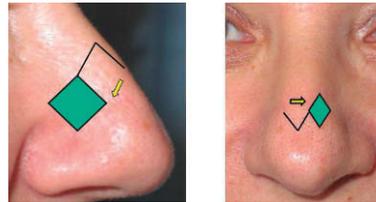
are designated as follows according to the angle of the rhombus: Limberg for angles of 60° and 120°, Dufourmental for rhomboid defects with angles of 75° and 115°, and a combination of the 2 for defects in which all of the angles are 90°.

### Lobed Flaps

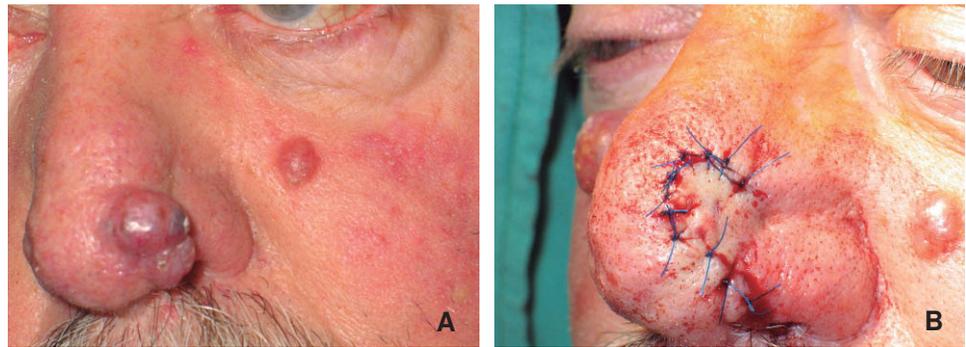
These are transposition flaps and can be simple, bilobed, or trilobed, according to the site and dimensions of the defect.

The simple lobed flap is used for small rounded defects in the different areas of the nasal dorsum and lateral walls, including the nasal alae (Figure 24 A, B).

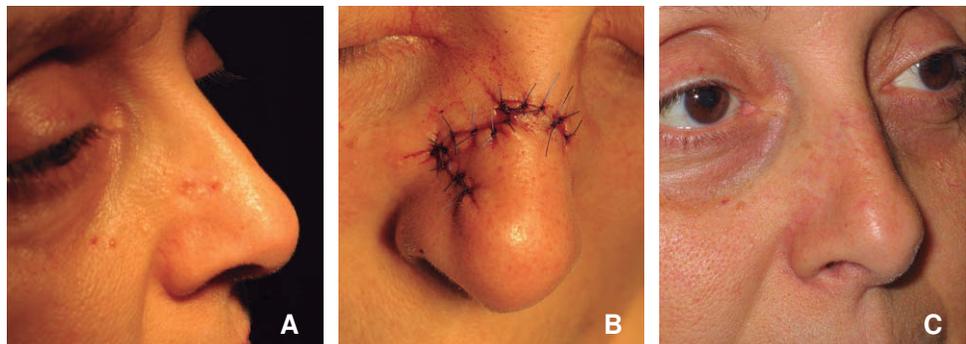
The bilobed flap (Figure 25 A-C) is used for reconstruction of the lateral wall. It is also useful for the reconstruction of the nasal tip (Figure 26 A-D), but always for defects smaller than 1.5 cm. Inferiorly based flaps run at 45° and 90° from the axis of the defect, either over the



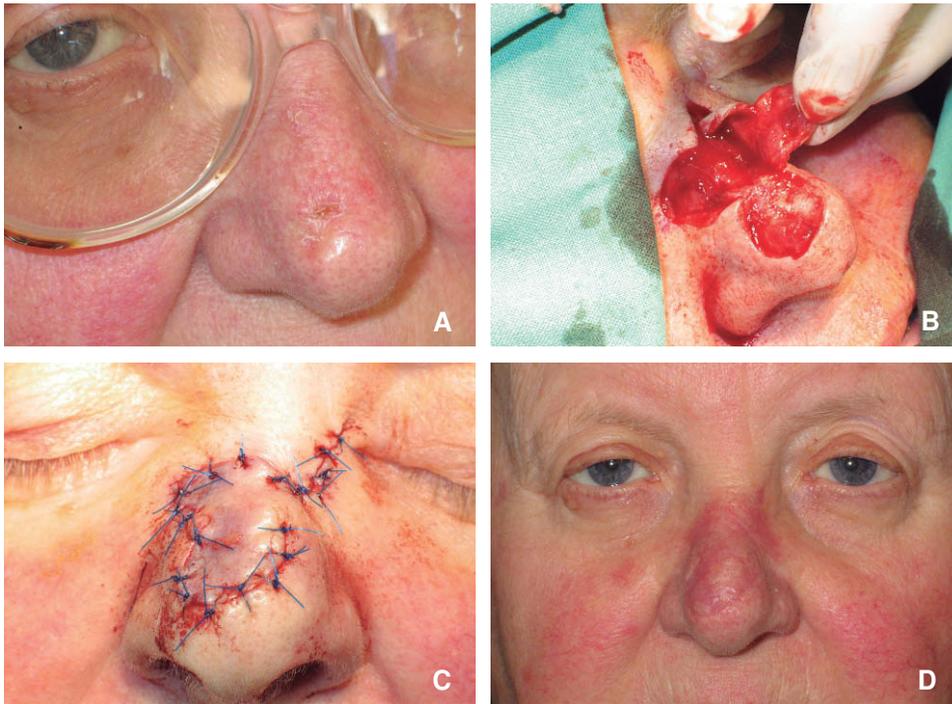
**Figure 23.** Rhomboid flaps (Limberg and Dufourmental).



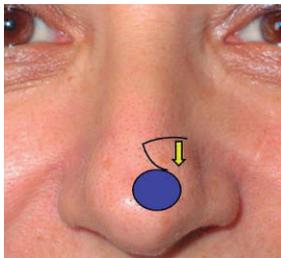
**Figure 24.** Simple transposition flap. A. Appearance of the tumor (nodular basal cell carcinoma). B. Appearance of the flap.



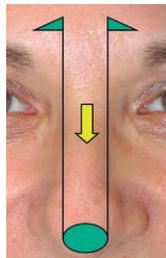
**Figure 25.** A. Basal cell carcinoma of the lateral nasal wall. B. Repair of the defect with a bilobed flap. C. Cosmetic result 1 year after intervention.



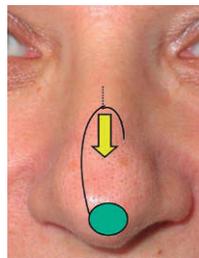
**Figure 26.** A. Basal cell carcinoma of nasal tip. B and C. Bilobed flap procedure. D. Result 1 month after intervention.



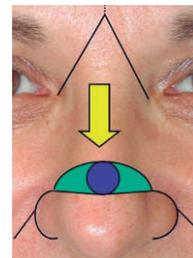
**Figure 27.** Banner flap.



**Figure 28.** Rintala flap.



**Figure 29.** Vertical hatchet flap.



**Figure 30.** Bipedicle V-Y flap.

lateral wall if the defect is small or over the lateral wall and dorsum in larger defects. The axis of rotation of each lobe should not be greater than 50°. The pivot point should not be located in the alar margin or the medial canthus of the eye. The flap should be dissected in the submuscular plane, above the periosteum/perichondrium.

#### **Banner Flap or Classical Rotation Flap (Also for the Nasal Dorsum)**

This flap is used to cover the lateral wall of the nose, designing a flap over the skin of the dorsum of the nasal root and allowing direct closure of the donor area (Figure 27). Other sites in which it can be used are the nasolabial area, the supraalar base, and the edges of the nose. In this case, surplus skin is used from the upper part of the lateral wall in a longitudinal orientation. This type of

transposition flap involving skin and subcutaneous tissue would not be indicated for the repair of small defects in the thick, rigid skin of the nasal tip or alae; instead, they are appropriate for areas of the nose with a fine, lax skin that allow direct closure of the donor area for the flap.

#### **Triangular Subcutaneous Pedicle Flap or Comet Flap**

These flaps are useful for defects of between 1.5 and 2 cm at any level of the lateral walls and nasal dorsum. The procedure involves isolation of a small island of epidermis and dermis above an elastic neurovascular column made up of fatty tissue that acts as a pedicle and allows the island to be moved in any direction. The apex of the flap is sutured in a V-T orientation (Figures 3 and 4).

### Advancement or Sliding Plasty

This is used to close defects in the nasal walls above the alae.

### Nasal Tip

The nasal tip is very delicate due to the limited laxity of the skin that forms it and of the surrounding tissues. The following represent the most commonly used flaps:

1. Pan-nasal flap
2. Rintala flap (Figure 28). This flap allows direct downwards advancement of the nasal dorsum unit, also extended towards the glabellar area to cover defects of the dorsum and nasal tip. To allow descent of the flap, 2 Burow's triangles should be excised on either side of the base of the pedicle. The advantage of this flap is that it provides skin that is most similar to the nasal tip. However, the excessive length of the flap sometimes leads to necrosis of the most distal part. Another drawback is the shortening of the nose, and this has led to it no longer being used in practice.
3. Double superiorly based sliding flap. To repair small defects, less than 1 cm, of the nasal tip. It is a mixed sliding and rotation flap. A rounded excision of the defect is performed and in the upper part 2 triangular flaps are designed that are dissected, rotated, and advanced to suture the defect.
4. Haneke double rotation flap. This flap is used for defects that affect the entire curvature of the nasal tip.
5. Vertical hatchet flap. This is a rotation flap that can be used for small defects in the nasal tip. The defect is dissected in a circular or elliptical fashion and a flap is designed in the upper region in the form of a "hatchet" that is displaced downwards to cover the defect (Figure 29).
6. Simple, finger, or lobed transposition flaps (Figure 26 A-D),<sup>12-14</sup>
7. V-Y bipedicle flap (Figure 30).

### Nasal Ala

Transposition flaps are the most widely used. For small defects, simple, finger, or lobed flaps are used. Bilobed flaps

are used for larger defects. All of those have been described previously.

### Acknowledgments

Dr Pedro Benítez from the Otorhinolaryngology Department of Hospital Municipal de Badalona, Spain, was involved in the intervention illustrated in Figure 8 and Anna Altayó kindly allowed her nose and ears to be used for the illustrations.

### Conflicts of Interest

The authors declare no conflicts of interest.

### References

1. Brufau Redondo C. Cirugía de la región nasal. Clínicas dermatológicas de la AEDV. Barcelona: EMC Prodrug; 2000.
2. Garcés JR, Puig Ll. Manual de cirugía dermatológica. Barcelona: Prodrug Multimedia SL; 1999.
3. Chang JS, Becker SS, Park SS. Nasal reconstruction: the state of art. *Curr Opin Otolaryngol Head Neck Surg.* 2004;12:336-43.
4. Chen EH, Johnson TM, Ratner D. Introduction to flap movement: reconstruction of five similar nasal defects using different flaps. *Dermatol Surg.* 2005;31:982-5.
5. Mellette JR, Ho DQ. Interpolation flaps. *Dermatol Clin.* 2005;23:87-112.
6. Kimyai-Asadi A, Goldberg LH. Island pedicle flap. *Dermatol Clin.* 2005;23:113-27.
7. Leonhardt JM, Lawrence N. Back to basics: the subcutaneous island pedicle flap. *Dermatol Surg.* 2004;30:1587-90.
8. F Camacho, F de Dulanto. Cirugía dermatológica. Madrid: Aula Médica S.A.; 1995.
9. Moreno-Arias GS, Vilalta-Solsona A, Serra-Renom JM, Benito Ruiz J, Ferrando J. Intense pulsed light for hairy grafts and flaps. *Dermatol Surg.* 2002;28:402-4.
10. Cook J. Nasal reconstruction. Available from: [www.emedicine.com](http://www.emedicine.com) 2006.
11. Carucci JA. Melolabial flap repair in nasal reconstruction. *Dermatol Clin.* 2005;23:65-71.
12. Aasi SZ, Leffell DJ. Bilobed transposition flap. *Dermatol Clin.* 2005;23:55-64.
13. Rohrer TE, Bhatia A. Transposition flaps in cutaneous surgery. *Dermatol Surg.* 2005;31:1014-23.
14. Alam M, Goldberg LH. Oblique advancement flap for defects of the lateral nasal supratip. *Arch Dermatol.* 2003; 139:1039-42.