

Technical Experiences

Reconstruction of the Nasal Tip

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Defects of the nasal tip present complex problems in terms of reconstruction, since they involve an important region both from functional and anatomical points of view. The authors present their experience in reconstructive surgery of the nasal tip, evaluating the results related to the use of flaps and free grafts. Among their cases, 132 patients were selected, with a prevalence of female patients, with a median age of 60. The deformities observed were postsurgical, following the exeresis of benign and malignant neoformations. The techniques utilized involved the use of median frontal, nasomental and nasolabial flaps. Of all of the patients treated, good aesthetic results were obtained in 79% of the cases, characterized by a good projection of the tip and by minor scar retraction, with full satisfaction on the part of the surgeon and the patient. On the other hand, some patients were defined as nonsatisfactory, with the deformity caused by scar retraction of the tip and abnormalities in color and thickness of the skin grafted. With a few exceptions, the patients had a good postoperative recovery without events worthy of note. On the basis of the results obtained, we can recommend advancement flap for lateral nasal defects, transposition of nasolabial flap for the reconstruction of the nasal alar. Naso-labial flaps with a subcutaneous pedicle are effective for correcting injures or defects involving the lateral surface of the nose.

Key Words: Reconstruction, nasal tip

Defects of the nasal tip, of the alae and the columella, present complex problems in terms of reconstruction, since they involve important regions from both the anatomic-aesthetic and functional points of view. Neoplastic and traumatic pathology, which are frequent pro-

blems in these areas, can involve the proximal third of the nose supported by the osseous nasal pyramid, the third median with the upper lateral cartilages, and the third distal with the inferior lateral cartilages (or lobule of the alar cartilages), which are of varying severity, also depending upon the depth of the defect. When nasal reconstruction is planned, it is necessary to think of the nose as a composite of three principal layers: the cutaneous covering, the skeletal support, and the mucosal layer. The loss of the cartilaginous structures of the nose, especially of the lobe, is fairly common, and its reconstruction is known as "sub-total."¹ The nasal bones are deeper and are therefore less frequently affected; whenever they are, they determine a genuine total defect, even though the extended replacements of soft tissue and cartilage are also commonly called "total." A primary repair is not indicated for defects of this type, since the natural appearance of the tip would be altered. For larger defects, reconstruction can be done with flaps and free grafts.² The most commonly utilized techniques use the nasogenian and nasolabial flaps, or the median frontal flap and its variants. For less severe defects, the choice of an appropriate procedure is more difficult.

MATERIAL AND METHODS

At the Department of Plastic and Reconstructive Surgery at the University of Rome "Tor Vergata," between January 1995 and December 2004, 652 patients underwent reconstructive and cosmetic surgery of the nasal area; 15 having stenosis of the nasal valves, and 132 with tip deformities. Among those, a group of 101 women and 31 men age range between 25 and 80, with a median age of 60 has been selected. The deformities observed were following demolitive surgery for benign and malignant tumors. A preoperative study was carried out through photographic clinical exam of the nasal area and face, and with an examination of the nasal cavities by means of anterior rhinoscopy. In the more complex cases, such as extensive neoplasias, computed tomography scans with three-dimensional imaging were done for a better view of the anatomic structures. The techniques involved the use of median frontal, nasogenian and nasolabial flaps.

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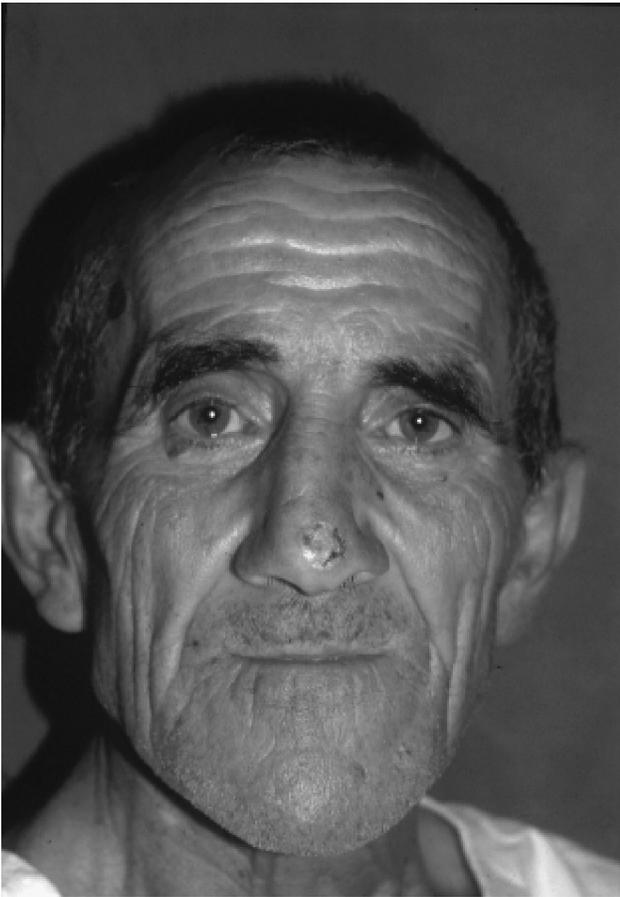


Fig 1 Preoperative image in frontal projection. Evidence of epithelioma of the nasal tip.

Postoperative follow-ups were conducted after 2 and 6 weeks, 3, 6, and 12 months, and then annually, for a minimum of 1 year and a maximum of 8.

CLINICAL REPORT

A 61-year-old patient came to our attention with basal cell epithelioma of the nasal tip. At the clinical evaluation, the tumor appears, with a maximum diameter of approximately 2 cm, protruding from the cutaneous plane, having irregular margins and clear-cut limits, of a purplish color. (Fig 1). After appropriate clinical exams, the patient was operated upon, with a total exeresis of the neoplasias and preparation of an island forehead flap Indian type, and vascularized by the right supratrochlear artery. Rotation occurred through a subcutaneous tunnel of the nasal dorsum to the tip. (Fig 3). After an accurate hemostasis, closure with interrupted sutures followed, using 4-0 and 5-0 nylon. The

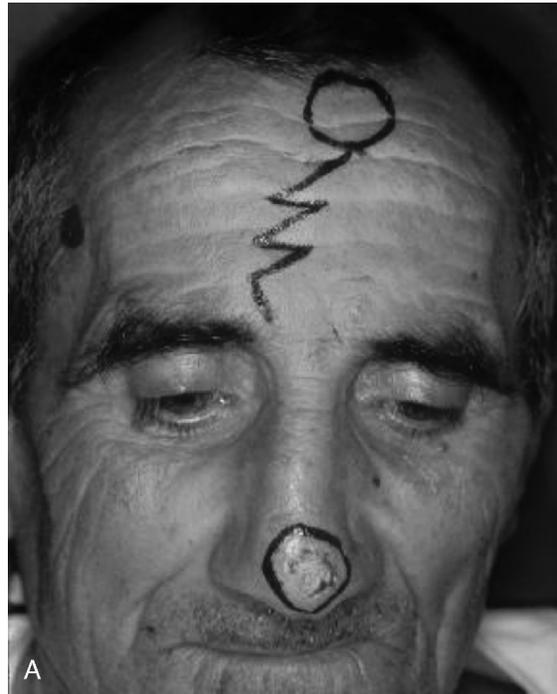


Fig 2 (A) Preoperative image in frontal projection. Preoperative markings. (B) Preoperative image in lateral projection.

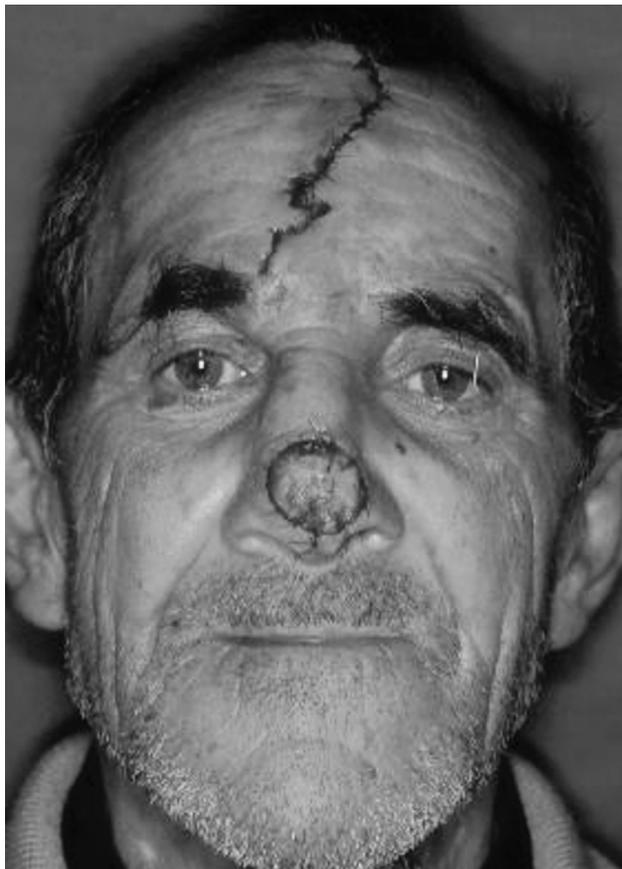


Fig 3 Postoperative image in frontal projection. Evolutionary phase.

postoperative following occurred without any complications, with a final good result. Grafting sites anatomic-cosmetic outcome with minimal scarring and no retraction on both donor and grafting sites were confirmed by long term follow-up (Figs 2–5).

RESULTS

Of all of the patients treated, good cosmetic results were obtained in 79% of the cases, with a good projection of the tip, minor scar retraction, and full satisfaction on the part of the surgeon and the patient. On the other hand, patients defined as nonsatisfactory deformities caused by scar retraction at the tip and abnormalities of color and thickness of the skin grafted. With a few exceptions, the patients had a regular postoperative recovery without events worthy of note. There were no infections, due to antibiotic coverage and careful asepsis. We should note only one case of cutaneous necrosis. Reoperations were done in 13% of the cases

for cutaneous necrosis or cosmetic dissatisfaction on the part of the patient.

DISCUSSION

The target of nasal reconstruction is the restoration of the anatomy and functionality of respiratory airways. The choice of the reconstructive method is based on the size, location, and depth of the defect to be corrected. The techniques involve the use of frontal flaps, flaps on the lateral part of the cheek and flaps from the arm. Currently, variants of the first two types are being used.³

The paramedian frontal flap, which is today more useful in nasal reconstruction, is based on a single supratrochlear vessel, and drawn on the part of the forehead that is contralateral to the defect, ensuring a pedicle of adequate length, and a rotation without tension of the defect. The flap is curved along the scalp to lengthen the pedicle, with a curve turned preferably towards the location of the defect. Moreover, the base of the pedicle is cut at the nasal radix to allow one further centimeter of rotation. The lifting/undermining of the flap begins

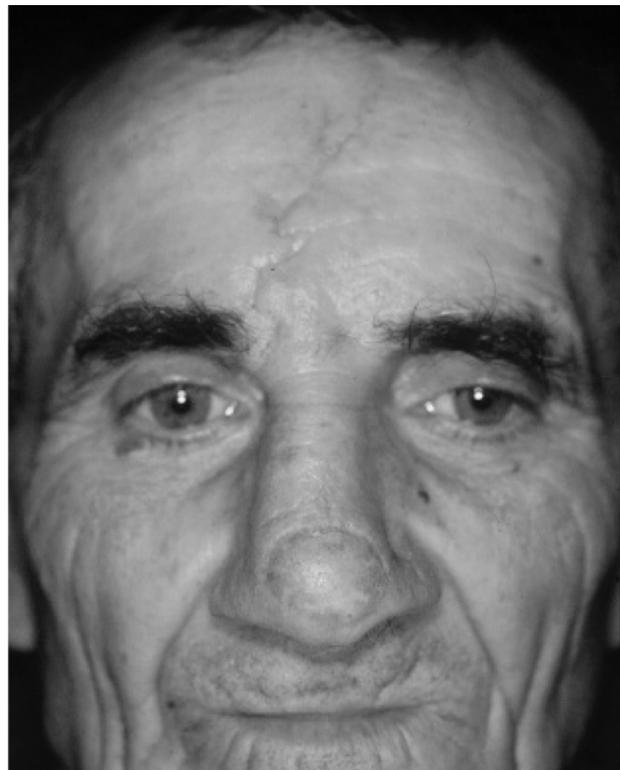


Fig 4 Postoperative image in frontal projection. Coverage of the defect.

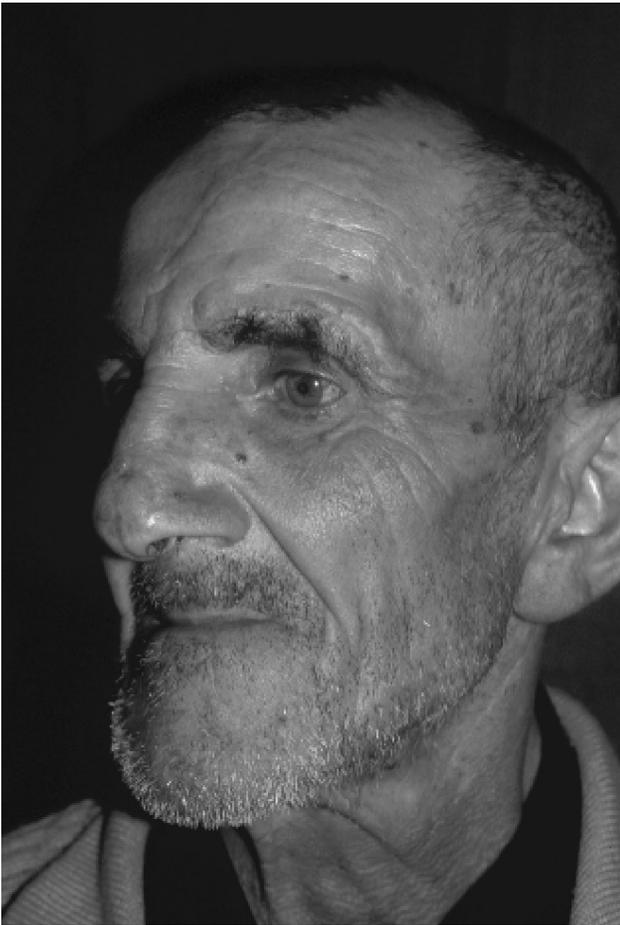


Fig 5 Postoperative image in $\frac{3}{4}$ projection.

in the subcutaneous, at the level of the cranial end and is deepened in the subgaleal plane along the vertical component of the pedicle, up to the subperiosteal plane. The cutaneous island to be inserted is thinned up to the derma, saving (sparing) the subdermal plexus.⁴ On the other hand, French authors emphasize the use of cheek flaps, which can be distinguished in this way: advancement flaps, transposition of nasolabial flaps, and subcutaneous pedicled flaps. The first, based on a subdermal vessel are excellent for the repair of lateral nasal defects. When the inferior margin of the incision is placed along the alar groove, the paranasal skin is advanced in the nasal lateral surface to reach the median line. Depending on these lines, up to approximately 2.5 cm of skin of the paranasal and cheek areas are available, while the donor site can still be closed by direct suture. This method can still cause the flattening of the naso-genian fold, and require a second corrective operation.

The transposed naso-labial flaps, with both a superior and inferior base, are especially useful in the reconstruction of the nasal alar for their tendency to heal in a round shape, similar to that of the alar. They are reduced to a thin layer of subcutaneous tissue and skin before the transposition, which allows a single-procedure reconstruction of defects smaller than 2.5 cm. Naso-labial flaps with a subcutaneous pedicle are effective for correcting injuries or defects involving the lateral surface of the nose. The subcutaneous vascular pedicle is based on the infraorbital foramen, and the island of skin of the nasolabial groove is transferred above with ease, in the area of the defect. The defect created by the lifting of the flap is closed by the direct advancement of the redundant skin of the cheek. The only disadvantage is the relatively short radius of movement, which renders it impossible to reach defects on the distal part of the nasal dorsum. When a flap with a supramedial subcutaneous pedicle and a base at the level of the piriform aperture is flipped 180° and rotated at a right angle at the base to provide the covering of the nostrils, it is known as an overturned nasolabial flap.⁵ The use of skin grafts, which are necessary for wider defects, is determined by four elements: thickness of the skin surrounding the lesion, color and state of the remaining skin of the nose, and size of the defect.⁶ In order to achieve best results, the donor skin must be completely similar to the skin in the receiving area. For defects affecting the skin of the upper two-thirds of the nose, full thickness cutaneous grafts are used, for which the most common donor site is the retroauricular area.⁷ Transplants up to 4 × 5 cm in diameter can be obtained, with direct suturing of the retroauricular donor site. These are relatively thin transplants, which rapidly vascularize. Thicker

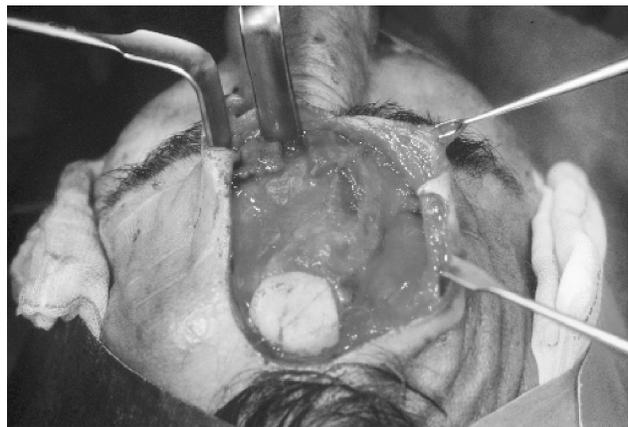


Fig 6 Intraoperative image.

skin can be obtained from the nasolabial fold, the preauricular and supraclavicular areas. Partial thickness skin grafts are only used to provide a base upon which to implant a nasal prosthesis, as they tend to develop a much more significant secondary retraction, and have a smooth and shiny appearance on the scar that contrasts with the natural color of the central part of the face. Small defects affecting the nasal alar can be resolved with composite grafts made up of auricular tissue, obtained from the earlobe, the helix rima, or the helix radix. The most common are those with use of skin and fat tissue for alar defects or the chondrocutaneous ones for defects of the nostril rims. In all cases, a composite graft that is more than 5 mm far from the vascular bed is at risk of necrosis. Such grafts should not be more than 1.5 cm.⁸

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