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CASE REPORT

Nasal alar and lobule reconstruction – Case presentation

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ABSTRACT

We present a reconstruction of a posttraumatic nasal lobular and alar defect in a three-stage intervention. The first operation restored the cartilaginous support by a combination of a free conchal composite graft and a septal chondromucosal pivotal flap covered by a paramedian forehead pedicled flap. The second operation separated the pedicle of the flap, followed one month later by cosmetic refinements. We restored both length and shape of the nose and a functional symmetrical nostril. Surgical options are discussed regarding available donor areas and techniques.

CONCLUSION. Lobule reconstruction must be performed as an entire esthetic unit and must address all three layers – skin, cartilage and internal lining. Careful planning is fundamental in ensuring good cosmetic results.

KEYWORDS: nasal lobule reconstruction, chondromucosal pivotal flap, paramedian forehead flap

INTRODUCTION

Nasal lobule reconstruction represents a challenge for the plastic surgeon that has to restore the region from both esthetical and functional aspects. These technical difficulties come from the need to respect the esthetic units of the nose and to restore all three layers – skin, cartilage and vestibular coverage, in a region with no tissular excess. The first step to achieve is to restore the cartilaginous framework strong enough to support the skin envelope and with the appropriate shape to create an esthetically pleasant nasal lobule and ala, with a round and symmetrical nostril. All classical donor areas for cartilage can be used – septum, ear, rib – but keeping in mind from the start the need to cover the free grafts with good vascularized tissues. In this aspect, if the septum is partially missing, septal chondromucosal flaps are a valuable option to restore both structural support and internal lining[1].

There are several local and regional flaps that can cover small skin loss of the nose, but usually do not reach as far as the lobule, especially if the defect descends towards the columella and cannot provide enough tissue to replace the entire esthetical unit[2]. Those cases are better addressed with either a frontal flap or a distant microsurgical transfer.

We present a case of partial traumatic loss of the lobule and left ala reconstructed with a combination of techniques that included a free cartilage graft, a septal flap and a forehead flap.

CASE REPORT

A 46-year-old male patient was referred to us after a car accident which resulted in a partial loss of the lobule and left alar margin. The initial treatment consisted in a simple cutaneo-mucosal suture.

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The local examination revealed a structural deficit of the tip of the nose, with partial loss of the right alar region and of the columella as well as the nasal lobule (Figure 1). A scar on the right alar crease, extending into the nasal groove, was retracted, additionally deforming the region. A mucosal scar on the inner aspect of the right nostril was extending from the septal to the alar portions of the vestibule, reducing the nasal cavity to less than half.

The patient agreed to a two-stage reconstruction of the tip of the nose with a frontal flap and composite chondro-cutaneous graft from the right ear.

Under general anesthesia, all the scars were excised in order to recreate the original posttraumatic defect. In the nasal groove, the scar was released with a Z-plasty.

For the restoration of the cartilaginous framework we opted for two different techniques. For the right ala, the height of the deficit was about 5 mm compared to the left side and we chose a composite skin-cartilage graft taken from the right concha, its skin being designated for the vestibular aspect (Figure 2 left). For the septo-columellar reconstruction we used a rotation septal chondro-mucosal flap according to Burget and Menick. The septal mucosa on the left side was elevated in a subperichondrial plane and we created a 3 cm-long chondro-mucosal flap by detaching the septum from the premaxilla. The pivot point was kept anteriorly and the flap was rotated caudally (Figure 2 center). The excess of the septum, which was protruding posteriorly, was resected and sutured to the caudal margin of the septal flap in order to increase the mechanical resistance

Figure 1 Initial aspect

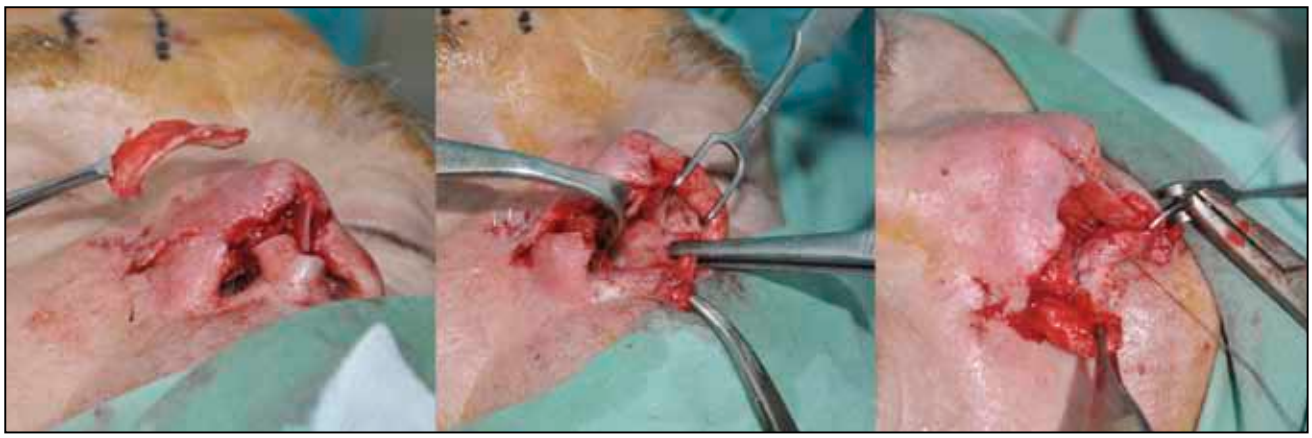

Figure 2 Cartilaginous reconstruction – free conchal graft (left), septal pivotal flap (center) and reinforcing the caudal septum with a cartilaginous strut (right)

Soft tissue coverage was achieved with a paramedian forehead flap. A template was drawn with the defect and transposed to the forehead skin (Figure 3). The flap was raised in the supraperiosteal plane and transposed to the recipient site. At three weeks, the base of the flap was divided with no vascular problems. After another four weeks, with the flap completely integrated, small cosmetic corrections have been made in the columellar region (Figure 4), but the patient declined further improvements in the eyebrow region. Finally, the patient was very pleased with both cosmetic and functional results.

DISCUSSIONS

Cosmetic reconstruction of the tip of the nose poses problems because the surgeon must respect and restore all three layers of the region – outer skin, cartilaginous support and vestibular mucosal lining[1-3]. Choosing the appropriate source of cartilage depends on the availability of soft tissues in the recipient area and the planned skin coverage method[2,4].

Alar cartilage can be replaced either with free grafts or pedicled chondromucosal flaps from the septum. Koenig was the first one who used the ear as a donor area of a composite graft in alar reconstruction, technique later popularized by Gillies[1]. This method remains the first option in repairing defects less than 1 cm in height, in order to gain a good revascularization of the graft from the recipient bed[5]. This three-layered graft can and should be reduced to a two-layered graft in larger defects and covered with a vascularized flap, such as the frontal flap, in order to provide a better recipient bed[1,6,7]. The septal door flaps with a hinge at the level of the dorsum can provide vascularized cartilage plus internal lining, but the technique can be applied only if the septum is intact[3,8].

The reconstruction technique of the caudal border of the septum depends on the availability of soft tissue coverage and the size of the defect. If there is sufficient mucosa, a cartilage graft from the rib is the first choice,

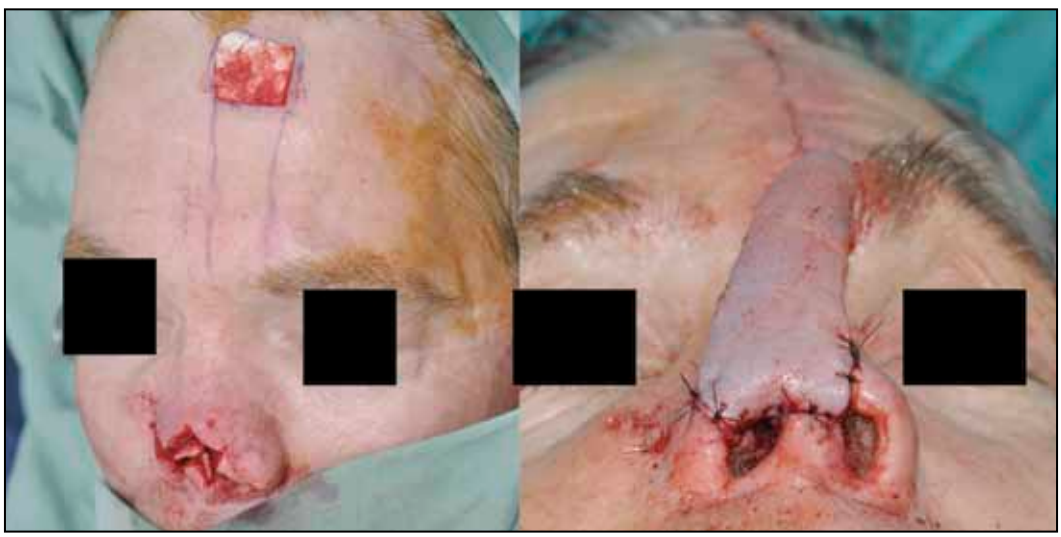

Figure 3 Paramedian frontal flap planning and immediate result

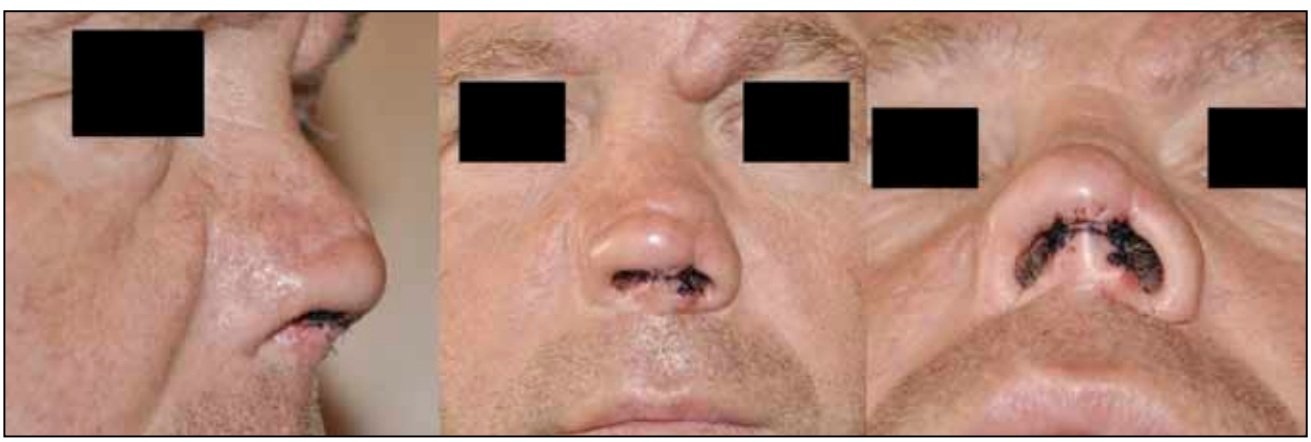

Figure 4 Final result two months after the reconstruction

offering good structural support for the tip[1,6,9]. The graft, tailored appropriately, should be secured to the remnant of the septum and to the anterior nasal spine.

A composite deficit of the septum and its lining requires the use of vascularized chondral flaps[1,4]. The chondromucosal pivotal septal flap is one of the most versatile techniques for lengthening the caudal septum. Based on the nasal alar basal artery[10], the flap includes the septum and its mucosa on one side, leaving the opposite mucosa-perichondrium in site. The vascularized septal graft can be rotated and advanced as much as needed and is attached to the nasal spine. If the rotation creates a dorsal cartilaginous excess, it can be trimmed and used as a free graft if needed[1,9].

Nasal lobule defects should be reconstructed as a single esthetic unit, even if that means excising some normal skin[1,2,6,9]. The size of the defect precludes the use of local flaps, and the most used is the frontal flap[6,7,9]. Based on the supratrochlear artery, the paramedian frontal flap offers the best matching skin in any amount needed for a nose reconstruction. The flap design should be drawn after the cartilaginous support has been restored and the real soft tissue defect is correctly reassessed. If the flap has to be folded, an extra 2 mm of length is necessary[2] and its extremity can be thinned as needed[1]. The donor site can usually be closed directly, but larger flaps can impose the use of skin grafts or leaving a small area for secondary healing[9]. Only complex total nasal reconstruction requires free flap transfers[6].

CONCLUSIONS

In our case, the combination of a free chondrocutaneous graft, a chondromucosal flap covered by a frontal paramedian flap has successfully restored the missing nasal lobule and ala nasi. All decisions in planning a complex three-layer reconstruction of the lobule depend on the quality of the soft tissue coverage both externally and internally. For the alar reconstruction, a free auricular two-layer chondro-cutaneous graft can be revascularized by the frontal flap, while, for the full thickness septal loss, only a vascularized chondro-mucous flap could ensure the survival of the reconstructed cartilaginous framework. The paramedian frontal flap must replace the entire esthetic unit of the lobule and should be drawn 1-2 mm longer than measured if it has to be folded towards the columella or the inner aspect of the ala.

Conflicts of interests: None.

Contribution of authors: All authors have equally contributed to this work.

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