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# Case Report: Nasal Deformity & Reconstruction with Rib grafting & Forehead flap

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## Abstract

Nasal reconstruction represents a challenge for the oral and maxillofacial 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 tissue excess[1].

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 columella and ala, with a round and symmetrical nostril. 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 columella, especially if the defect descends towards the columella and cannot provide enough tissue to replace the entire esthetical unit.

Those cases are better addressed with either a forehead flap[2-4] or a distant microsurgical transfer.

**Keywords**: Nasal defects, Nasal reconstruction, Forehead flap, Nasolabial flap, Nasal lining, Cartilage graft.

## Introduction

Nasal involvement has long been recognized as a feature of granulomatosis with polyangiitis5 (GPA) (formerly known as Wegener granulomatosis), in which granulomatous destruction of nasal cartilage can result in nasal septum perforation (NSP) and saddle-nose deformity6,7.Less commonly, cases of NSP have been linked with systemic lupus erythematosus (SLE) 8,9 rheumatoid arthritis,10 cryoglobulinemia,11 Crohn colitis,12 and other autoimmune disorders.13-17In

tropical areas,the Leprosy and the Leishmaniose are still causes of uncommon septal perforation.The neoplasias and carcinomas also can cause to the perforation of the septum nasal.Others iatrogenic causes can occur as the use of nasal corticosteroid mucous membrane cauterization for the treatment of epistaxis, nasotracheal intubation and nasal turbinates cryosurgery.18The nose is particularly vulnerable to cutaneous malignancies19. Like a magician, the surgeon must re-create the nasal contour from missing puzzle pieces. He must enlarge defects to the limit point in which they can be rebuilt with minimum deformities and scars and more than satisfying outcomes. In order to achieve the best aesthetic results, the surgeon must have a tridimensional vision, must evaluate exactly the dimensions of the resulting defect, the damaged structures, and also he must have significantly good knowledge about the local nasal anatomy and about the anatomy and tissue characteristics of the surrounding areas of the frontal region.The first nasal reconstruction using forehead flaps was described in 600 B.C. by Sushruta Samhita. Since ancient times, specialists realized that the forehead is an excellent donor site for nasal defects, with good match for color and texture. It's versatility is due to its vascularsupport. Based on the supraorbital or supratrochlear arteries (first described by Dieffenbach,in 1845), the paramedian forehead flap20 is an axial flap designed on the medial side of the eyebrow, centered on a single supratrochelar/ supraorbital artery. The traditional medianforehead flap employes a central broad pedicle with both supratrochelar vessels21.We present a case of unknown complication with loss of the columella and lower septum reconstructed with a combination of techniques that included a rib graft and a forehead flap.

**Case presentation**

A 17 years male patient reported to our department on 15-06-2016 with the chief complaint of deformed nose.Patient's bystander gave the history of administering unknown parenteral medication to the patient at local hospital at the age of 1 year ,which leads to reactionary disfigurement of peripheral regions like nose tip ,ears, feet and hands .Two days following injection,respected part became black and amputated on its own.

On examination abnormality founds were absence of nose tip,columella region,absence of lower portion of nasal septum,with no associated olfactory dysfunction.

Deformed pinna,feet and hands,with no associated disability.

**Treatment**

Surgical TechniqueUnder general anesthesia the nasal cartilages and bones are skeletonized via a standard external rhinoplasty approach with particular attention to preserving the remaining septal mucosa.Skin and mucosa on dorsal surface incised and everted to use as an inner lining to receive the graft.A graft is taken from the sixth rib with an incision length of 4 to 5 cm. The entire circumference of the cartilaginous rib was dissected out from its perichondrial envelope.The caudal end of the septal part of the reconstruction is secured onto the anterior nasal spine (ANS) by drilling two small bur holes tangentially through the ANS and one bur hole in the caudal protruding edge.The forehead flap was lifted while dissecting in a sub-galeal plane for about 8 cm vertically and 5-6 cm horizontally, based on the defect's dimension at which we added 3-4 mm for healing contractures. Because of the pedicle's thin base, we were able to rotate the flap without any tension and to cover the nasal defect, resurfacing the nose from tip point to dorsum nasi.The donor site was closed primarily

.After 3 weeks, the pedicle was divided, with appropriate debulking and contouring the recipient site.

**Discussion**

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.Choosing the appropriate source of cartilage depends on the availability of soft tissues in the recipient area and the planned skin coverage method[22]. Alar cartilage can be replaced either with free grafts or pedicled chondromucosal flaps from the septum. 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 offering good structural support for the tip.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[22].The chondromucosal pivotal septal flap is one of the most versatile techniques for lengthening the caudal septum.

Based on the nasal alar basal artery[23], 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. Nasal lobule defects should be reconstructed as a single esthetic unit, even if that means excising some normal skin. The size of the defect precludes the use of local flaps, and the most used is the frontal flap.

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 and its extremity can be thinned as needed.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[24].Only complex total nasal reconstruction requires free flap transfers.

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**Legend Figure**

Figure 1: Pre-op- (Frontal)

Figure 2: Pre-op- (Basal)

Figure 3: Deformed Feet

Figure 4: Deformed Hands

Figure 5 : Intra-op (Nasal inner lining reconstructed & Forehead flap marking)

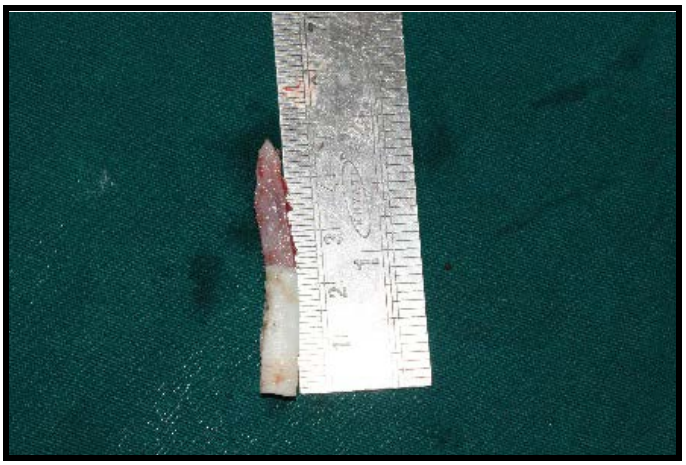

Figure 6 : Intra-op (Harvested rib)

Figure 7:Septal reconstruction

Figure 8: Forehead flap raised

Figure 9: Flap rotated & sutured

Figure 10: Post-op -9 Months (Frontal)

Figure 11:Post-op -9 Months (Basal)

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