

# Management of Cutaneous Nasal Defects

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## KEYWORDS

- Mohs excision • Nasal reconstruction
- Nasal defect • Skin graft • Local flap
- Dermabrasion • Forehead flap

## ETIOLOGY

Nasal reconstruction has reached a point in its evolution such that its goals no longer include simply filling the defect. The contemporary facial reconstructive surgeon aims for an aesthetic and functional result in the vast majority of cases. Cutaneous nasal defects most often result from oncologic surgery, such as either Mohs excision<sup>1</sup> or square technique,<sup>2</sup> or, less commonly, traumatic or iatrogenic injury. It is of paramount importance to confirm clear margins of resection before undertaking reconstruction because failure to do so risks recurrent cancer. Ensuring complete tumor removal often involves collaboration with a Mohs micrographic surgeon<sup>3,4</sup> or delayed reconstruction, which allows time to confirm negative margins of permanent pathologic specimens. Pathology reports should be reviewed to determine whether there are indications for adjuvant treatment (perineural or lymphovascular invasion), such as external beam radiotherapy before reconstruction.

Although this article focuses on reconstruction of oncologic defects, the principles discussed can be effectively applied to traumatic defects, as well. However, restraint should be exercised in the initial management of traumatic defects to allow the wound to heal and to eliminate potential wound contamination before repair. In many cases, defects managed expectantly will heal

sufficiently to either minimize the required reconstruction or preclude any surgical intervention.

## DEFECT ANALYSIS

Critical analysis of a nasal defect should precede reconstruction of even the smallest wound. The first step in nasal reconstruction is thoughtful evaluation of the defect. The primary goals are to determine viable reconstructive options and to choose the optimal modality among those in the reconstructive surgeon's armamentarium. Nasal tissue may be divided into cover (skin, subcutaneous tissue and muscle), structure (upper and lower lateral cartilages, septum, nasal bones and tip-supporting mechanisms) and internal lining (vestibular skin and nasal mucosa). This article focuses on reconstruction of oncologic defects involving nasal skin and subcutaneous tissue only.

The most obvious aspects of a nasal defect are its location and size. These factors determine whether the defect can be reconstructed with adjacent nasal tissue, full-thickness skin graft (FTSG) or regional facial soft tissue. The surgeon must also determine which adjacent aesthetic nasal units<sup>5</sup> (Fig. 1) or facial regions are involved. In general, small defects ( $\leq 1.5$  cm) can be reconstructed with adjacent tissue or FTSG. Moderate (1.5–2.5 cm) and large ( $>2.5$  cm) defects typically require regional tissue or FTSG. Rarely, microvascular free tissue transfer is necessary for

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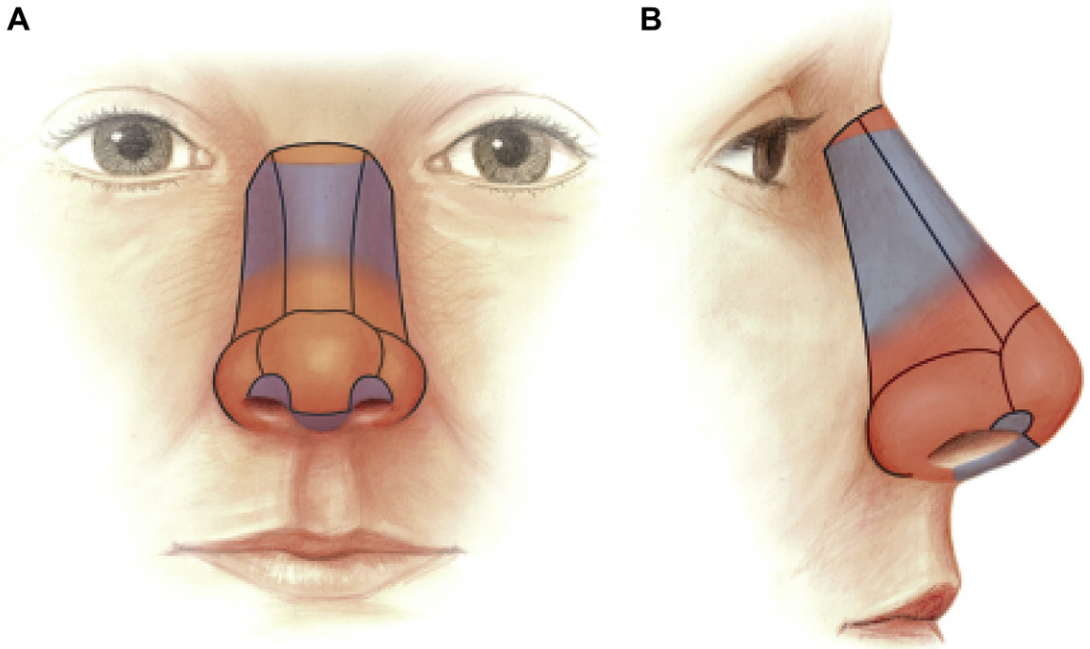
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**Fig. 1.** (A), (B) Nine nasal aesthetic units are recognized consisting of the paired nasal sidewalls, alae and soft tissue facets as well as the unpaired nasal dorsum, tip and columella units. The nasal skin is relatively thick and sebaceous over the caudal dorsum, tip and alae (red nasal regions) and thin over the cephalic dorsum, sidewalls, soft tissue facets and columella (shaded areas). (From Baker SR. Reconstruction of the nose. In: Baker SR, editor. Local flaps in facial reconstruction. Philadelphia, Elsevier Health Sciences; 2007; with permission).

reconstruction. For maximum aesthetic results, most authors recommend that for defects involving  $\geq 50\%$  of the surface area of a convex nasal unit (tip or ala), the remaining skin covering the unit should be removed *en bloc* and the entire unit reconstructed.<sup>5</sup> This approach places incisions at the junction of nasal units along shadow lines, which provide camouflage and optimize the appearance of scars. Further, expected wound contraction will produce a mild “trap-door” deformity, which causes a slight elevation and convexity of the unit which enhances the convex nature of the tip or ala unit.<sup>5</sup>

Although beyond the scope of this brief article, several basic principles of full-thickness nasal reconstruction should be kept in mind. First, composite defects should be reconstituted with “like” tissue. In addition to cutaneous reconstruction, septal/ auricular cartilage grafts, costochondral or split calvarial bone grafts are used to restore nasal structure. These structural grafts are used to support the nose and to fine-tune the contour of the reconstructed unit(s). Autogenous grafts are placed in both anatomic and nonanatomic locations to achieve these goals. Lining defects, in particular of the lower third of the

nose, are also meticulously repaired. Failure to restore nasal lining and structural support can result in unpredictable wound contraction and distortion of nasal topography. Thus, septal mucoperichondrium, turbinate mucoperiosteum, cutaneous hinge flaps or vestibular skin flaps are used to rebuild internal lining defects. Other sources provide a rich and detailed description of full thickness nasal reconstruction, which is beyond the scope of this article.<sup>6,7</sup>

#### PATIENT FACTORS

Of the numerous patient factors to consider, one of the most important and modifiable risk factors is the patient’s use of tobacco products. It is clear that current smokers are at risk for skin flap and graft failure.<sup>8–11</sup> If patients are unable to cease smoking before reconstruction, then they must be counseled about the increase risk of graft or flap failure. Avoiding FTSG reconstruction, raising thicker cutaneous flaps to recruit a more robust subdermal vascular plexus and minimizing wound closure tension are thought to mitigate risk of flap failure in smokers.

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