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Lateral Nasal Artery Pedicled Island Flap for Repair of Nasal Alar Defects

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The lower third of the nose is a prominent structure vulnerable to cutaneous malignancies. From a reconstructive standpoint, patients with moderate-sized defects that do not involve the alar rim or supra-alar crease represent a reasonably rare but singularly unique situation. Single stage flaps will typically cross the supra-alar crease and multi-staged flaps are often considered too aggressive for the lesion in question, unless full subunit excision and reconstruction is performed.¹ It is for this specific anatomic indication that the lateral nasal island flap was designed. The small flap is ideal for moderate alar lesions (1–1.5 cm), supplying acceptable texture and color matches based on a well-vascularized pedicle in a single-stage procedure. It also allows for cartilage grafting underneath the flap and avoids violation of the supra-alar crease.

Materials and Methods

Subjects

To date, three patients have been reconstructed using the lateral nasal artery island flap. All procedures were performed by the same surgeon (RWW) between 2008 and 2010. All patients were followed with photographic documentation; all granted written informed consent. A State University of New York Downstate Medical Center at Long Island College Hospital Institutional Review Board waiver was granted for this study.

Surgical Technique

The flap is designed parallel to the attachment of the nose to the face (**Figure 1**; Figure S1 available at otojournal.org). The center point of the flap should be placed according to the arc of rotation required to resurface the defect. Measurement from the inferior pyriform rim to the distal aspect of the defect is performed. The center of the flap should be equidistant from the edge of the pyriform rim.

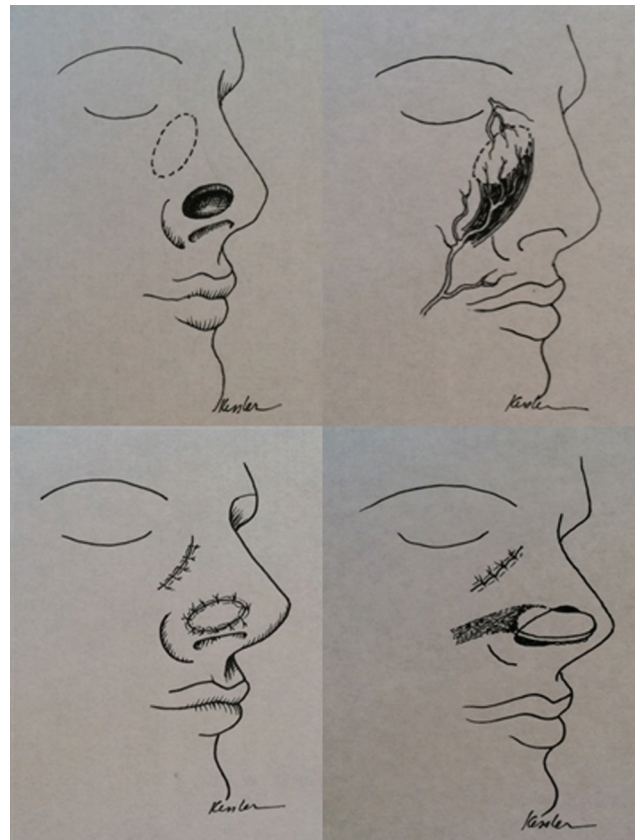


Figure 1. Lateral nasal artery pedicled island flap surgical procedure. Steps can be followed from the top left and proceeding clockwise.

Skin incision can be as large as 1×2 cm in width and length, with the long axis paralleling the nasofacial junction. Incision on the medial edge is taken down to the nasal

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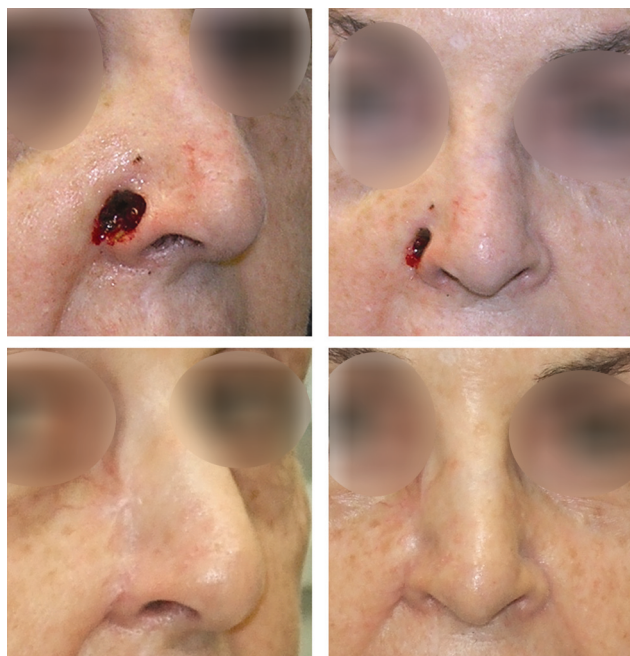


Figure 2. Preoperative (top row) and 1-year-postoperative (bottom row) findings for patient #1.

bones. Subperiosteal dissection is then done down to the inferolateral pyriform rim, and subperichondrial dissection is done along the upper lateral cartilage. Additional dissection is done along the bony and cartilaginous nasal dorsum for later closure purposes. Subcutaneous dissection is then done along the lateral aspect, both into the cheek and inferiorly to the pyriform rotation point. As one crosses underneath the flap to communicate with the subperiosteal nasal dissection, care is taken to stay superficial and avoid injury to the angular vessels. After 270 degrees of fat pedicle have been freed, the dissection is taken onto the medial aspect of the pedicle. Transition from subperiosteal and subperichondrial to subcutaneous dissection occurs. As the surgeon approaches the inferior aspect of the upper lateral cartilage, attention is given to identify the lateral nasal artery, which will routinely course into the scroll region to traverse the lower lateral cartilage.

Subcutaneous dissection is done underneath the supra-alar crease just above the nasal superficial muscular aponeurotic system. Once an entry pocket is created, the flap is brought through this pocket and placed into the defect. If, at the time of flap inset, the arc of rotation is limited, then additional subperiosteal elevation can be done along the medial and deep aspects onto the maxilla. Back cuts can be made in the lateral fat pedicle. The donor site is either closed primarily as a linear incision or with a secondary bilobed or note flap.

Results

All repairs yielded satisfactory results with no necrosis, alar notching, or flap loss (**Figure 2**; Figures S2 and S3 available at otojournal.org). All repairs had cartilage grafts

placed underneath the lower edge of the defect in order to provide alar support. One patient had a severe reaction to chromic sutures used to close the donor site. Suture abscess incision and drainage as well as postoperative steroid shots were required. Overall symmetry in addition to symmetry of the alar base, tip, and donor site were intact. Color and texture match, including the alar-facial junction, were excellent as well. One patient required a postoperative steroid injection for pin cushioning. All patients were satisfied with the functional and aesthetic results.

Discussion

Several approaches to alar lobule defect repair have been described. Although free skin grafts and cutaneous-based skin flaps may be ideal in terms of size and depth of defect, flap failure, postoperative dyspigmentation, and atrophy can contribute to an unpredictable outcome.¹ The bilobed flap is also acceptable for size and skin depth, particularly in regions of thicker skin. However, incisions and resultant scarring over multiple nasal subunits make this a less desirable approach in some circumstances.² Another rotational flap, the rhomboid, is suitable for the thin skin of the upper two-thirds of the nose, but is limited in the alar region due to vascularity issues and dog-ear deformities.¹ Transposition flaps including the forehead and Reiger are appropriate for larger lower nasal tip defects, but they are more morbid and bulky relative to alternative techniques.² While appropriate for moderate defects of the alar and side wall, advancing cheek flaps and melolabial flaps will efface the supra-alar crease; particularly when accomplished in a single step.²

While island flaps based off the lateral nasal artery have been previously described,³⁻⁵ they have involved skin paddles from the nasolabial fold region. Pedicled flaps taken from the lateral nasal sidewall have not been described. With rare exception, flattening of the nasolabial fold and asymmetry with the contralateral side is a common sequelae of nasolabial fold donor sites. By incorporating a random but robust subcutaneous flat pedicle, we were able to significantly reduce donor site morbidity by utilizing a much less conspicuous area, the junction of the lateral nasal sidewall and cheek.

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Author Contributions

Behrad B. Aynehchi, conception and design, acquisition of data, analysis and interpretation of data, drafting the article, final approval of the version to be published; **Richard W. Westreich**, conception and design, acquisition of data, analysis and interpretation of data; drafting the article, final approval of the version to be published.

Disclosures

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Supplemental Material

Additional supporting information may be found at <http://oto.sagepub.com/content/by/supplemental-data>

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