

The Tunneled Nasolabial Flap (Tunneled Island Pedicle Flap) for the Repair of Nasal Defects

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The repair of large or deep alar defects following the surgical removal of melanoma and nonmelanoma skin cancer can be challenging. The repair of such defects has been largely dominated by the use of the nasolabial transposition flap, bilobed flap, and forehead flap. For smaller or more superficial defects, second intention and skin grafts are commonly used.

The tunneled island pedicle flap, also known as the subcutaneous island pedicle flap or the flip-flop flap, has received increased recognition in recent years. Although more commonly used for the reconstruction of auricular defects, the repair of a defect involving the right nasal ala and nasal sidewall is presented.

Traditionally, the island pedicle flap is a triangulate flap that is completely separated from its surrounding epidermis and dermis.¹⁻⁴ The flap contains an underlying vascular pedicle that is based on the undisturbed subcutis that lies beneath the flap. This island of tissue is then advanced into the defect, thus creating a secondary defect that is closed.

The tunneled island pedicle flap (TIPF) has significant differences from the traditional island pedicle flap and, in some instances, more closely resembles a modification of the transposition flap.

First, the TIPF is not restricted to a triangulate shape of the traditional island pedicle flap. Second, the donor tissue does not have to be immediately adjacent to the defect that is to be reconstructed, although it must be in close proximity. Third, the flap is either subcutaneously advanced or subcutaneously transposed to fill the defect. The subcutaneous pedicle is devoid of dermis and epidermis.

The TIPF has several advantages over other flaps and grafts.^{5,6} The island pedicle flap has a reliable vascular

supply. Compared with other flaps that are used for nasal reconstruction, it may be possible to place suture lines in more concealable locations with the TIPF.

Although the TIPF is reliable in regard to survivability, a few disadvantages are known. Transposition flaps, including the bilobed flap, are prone to developing a trapdoor deformity—a fullness or elevation that may result from edema within the flap itself or constriction of the flap at its perimeter. Similarly, the TIPF may be prone to trapdooring. To reduce the risk of trapdooring, some advocate slightly undersizing the flap by 1 to 2 mm on either side when possible. When repairing nasal defects, one must ensure that no elevation of the alar rim occurs since this is not likely to resolve and, in some cases, may worsen. In most cases in which flap elevation does occur, simple massage or use of intralesional corticosteroids results in significant improvement. For nasal repairs, dermabrasion can be performed, as is commonly done for flaps and grafts on the nose. As this flap requires a subcutaneously placed pedicle, additional bulk may be added to the tunneled skin. In most traditional uses of the TIPF, such as auricular reconstruction, this is rarely a problem because the donor tissue is often in extremely close proximity to the defect. If the tunneled area is bulky, intralesional triamcinolone 10 mg/cc injected directly

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Figure 1. Defect on the nose-cheek junction marked immediately prior to closure with a tunneled island pedicle flap.

into the subcutaneous pedicle is very effective in reducing the bulkiness and may be repeated in 4 to 6 weeks if necessary.

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On the nose-cheek junction, the flap is drawn using a gentian violet marker (Figure 1). Using a 15-bladed scalpel, incisions are made down to the superficial subcutis. The flap is undermined from the lateral and inferior margins, leaving the medial and superomedial subcutis intact, which serves as a hinged pedicle. The medial portion of the subcutis may be undermined and even severed caudally (inferiorly) to facilitate movement of the flap if needed. Both the dermis and the epidermis are removed

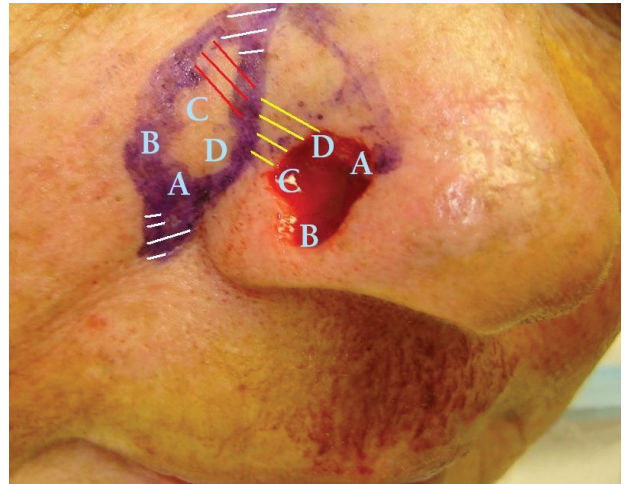


Figure 2. A tunneled island pedicle flap plan. Yellow lines indicate tunnel location for pedicle; blue letters, flap movement (A–A, B–B, C–C, D–D); red lines, de-epithelialized skin used for pedicle; white lines, dog-ears removed to facilitate closure of secondary defect.

from the superior pedicle, leaving a vascular-rich pedicle of subcutis.

A tunnel is created using blunt-tipped, curved scissors in the subdermal plane between the defect and the island. Extreme care must be taken not to disturb the flap's pedicle. Fine forceps are passed from the defect through the tunnel to grab the leading edge of the flap. The flap is turned one-quarter turn counterclockwise (Figure 2). If the defect were on the left side of the nose, the flap would be turned clockwise. The flap is pulled through the tunnel into position. If desired, the flap may be tacked in place using 5-0 Monocryl™ or 5-0 Vicryl™



Figure 3. A tunneled island pedicle flap immediately following closure (A) and immediately after suture removal, 7 days postprocedure (B).

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intra-dermal sutures. Superficial closure is performed using 6-0 Prolene™, although 6-0 fast-absorbing gut or 6-0 nylon may be suitable alternatives.

To facilitate closure of the secondary defect, both superior and inferior dog-ears are removed. The curvilinear defect is closed by primary side-to-side layered closure (Figure 3A). Sutures are removed 7 days after the procedure (Figure 3B). If trapdooring or bulkiness of the flap or tunneled skin is apparent, intralesional triamcinolone 10 mg/cc can be used.

SUMMARY

The closure of nasal defects can be challenging. For defects involving the nasal ala, reconstruction with the bilobed flap, nasolabial flap, forehead flap, or skin grafts has been commonplace. Each closure option has distinct advantages and disadvantages.

With the tunneled nasolabial flap, a single suture line is easily concealed at the nasal-cheek junction. In contrast, the traditional nasolabial flap requires a caudal cutaneous pedicle that requires 2 parallel suture lines extending up the nasal sidewall and a longer suture line down the nose-cheek junction and superior nasolabial fold. The bilobed flap is a robust and reliable flap that results in a somewhat

serpiginous suture line on the nasal sidewall. The forehead flap is reliable but results in a vertical scar on the medial forehead. Additionally, the need for an unsightly pedicle for 2 to 3 weeks that requires a second surgical procedure is undesirable to most patients.

The TIPF can be a useful tool for the repair of nasal defects. Like any local flap, the TIPF has a good skin color and texture match, which is an advantage over most skin grafts. The TIPF is, by nature, a bulky flap and can provide sufficient bulk to repair full-thickness defects. This flap is a valuable tool that, with proper planning, can have superior cosmetic results with minimal morbidity.

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