

Aesthetic Considerations in Facial Reconstructive Surgery: The V-Y Flap Revisited

Ram Kalus, M.D. and Sergio Zamora, M.D.

Columbia, South Carolina, USA

Abstract. The subcutaneous pedicled V-Y advancement flap (also known as the “kite flap” of Dufourmentel) has been described by many authors. Its versatility in reconstructive surgery is well known, both in facial reconstructive surgery as well as surgery of the trunk and extremities. Its advantages in achieving aesthetic reconstruction in specific facial regions have been less well emphasized in the literature. The flap can be designed within natural facial creases and heals inconspicuously because of its widely based subcutaneous or muscle pedicle which incorporates venous and lymphatic drainage over most of its length. The undesirable “bisecting” or flap edema frequently observed with other conventional transposition flaps is avoided. We have found the V-Y flap particularly useful in reconstructing the lower eyelid/medial canthus, supra-alar, and nasolabial regions. Our experience with over 40 such flaps is described, and technical considerations in designing and elevating the flap are discussed.

Key words: V-Y flap—Kite flap—Subcutaneous pedicled flap—Aesthetic facial reconstruction

The goal of an aesthetic reconstruction is restoration of normal facial appearance which would imply leaving the patient with no stigmata of prior surgery. In planning an aesthetic reconstruction one need consider not only the all too familiar Relaxed Skin Tension Lines (RSTLs), in which some variation exists [1], but normal facial topography where shadows exist due to constant and well-defined anatomical structures such

as the alar crease, nasolabial fold, malar crescent, etc. While full-thickness skin grafts or transposition flaps may satisfy the requirements of the reconstruction, their aesthetic outcome is often far from satisfactory. Color mismatch and contour irregularity may be a problem with grafts, and conventional transposition flaps such as the nasolabial flap often retain a “flaplike” appearance, even many years later (Fig. 1). The flap stigmata are probably related to a combination of violation of normal topographical lines, linear contraction of a circular scar, and residual flap edema, which may never resolve entirely. This can probably be explained by the fact that the arterial, venous, and lymphatic circulation of a transposition flap is entirely dependent on the dermal plexus, since most of the subcutaneous vessels are divided when the flap is elevated (Fig. 2A). If the subcutaneous circulation can be preserved, as in the V-Y advancement flap, (Fig. 2B) the aesthetic outcome is often superior.

The subcutaneous pedicled V-Y flap has been previously described by many authors [2–6] including Dufourmentel and Talaat [2], who coined the term “kite flap.” Rybka [5] correctly pointed out that in the nasal region it should be considered a musculocutaneous flap. This is also the case when the skin island overlies the orbicularis oculi muscle for defects of the lower lid and medial canthus.

Operative Technique

When feasible, primary closure is the preferred method of reconstruction as long as an acceptable aesthetic and functional result can be achieved. For larger defects, however, we have found the V-Y subcutaneous pedicled flap especially versatile and usually aesthetically superior to transposition flaps or full-thickness skin

Correspondence to Dr. Ram Kalus, USC Division of Plastic Surgery, Two Richland Medical Park, Suite 302, Columbia, SC 29203, USA

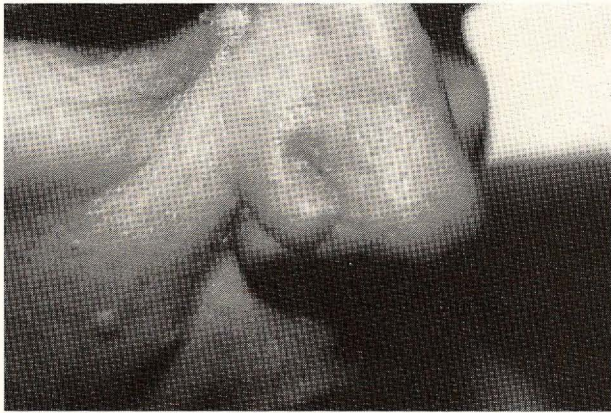


Fig. 1. Nasolabial pedicled flap for alar defect reconstruction. The flap is edematous and "flaplike" in appearance, and the aesthetically important alar crease has been obliterated.

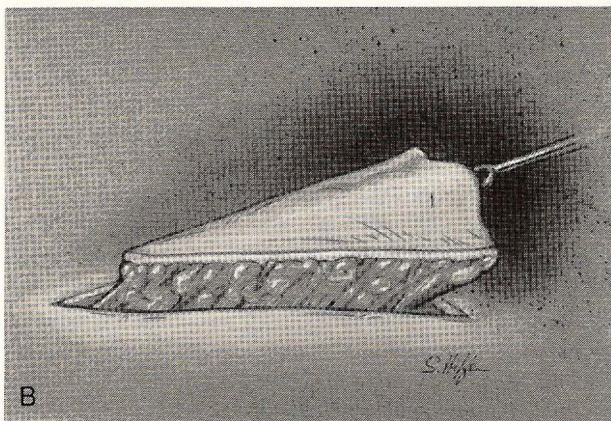
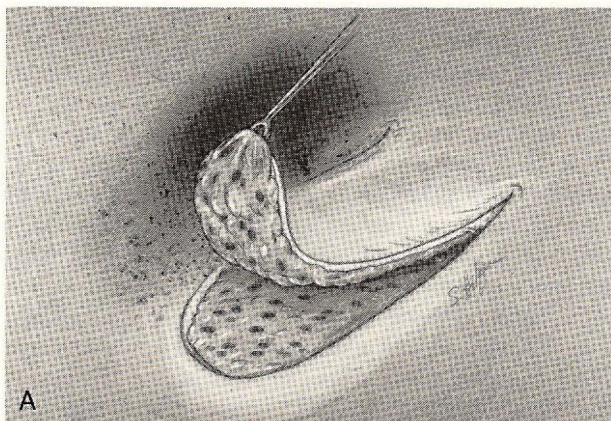


Fig. 2. (A) Conventional transposition flap with subcutaneous arterial, venous, and lymphatic vessels divided as the flap is elevated. (B) V-Y advancement flap preserving much of the underlying vasculature.

grafts, particularly in the infraorbital, paranasal, nasal lobule, and alar regions. When properly designed, the flap can follow naturally existing contour lines, thus respecting and preserving the normal facial topography

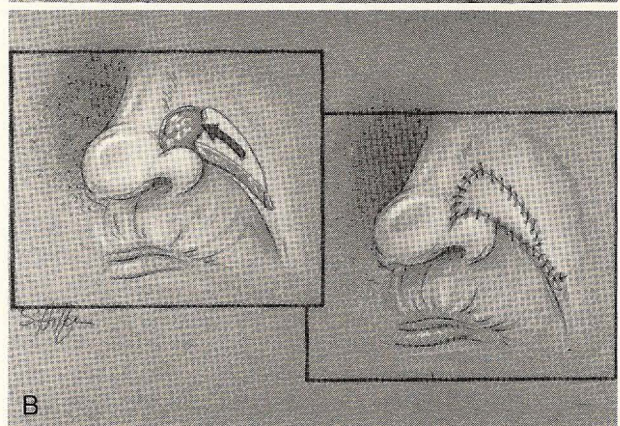
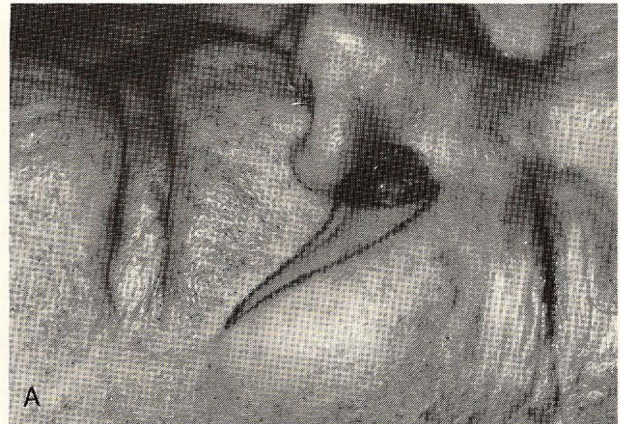


Fig. 3. (A) Patient with lateral alar defect. V-Y flap designed with inferior limb in nasolabial fold. (B) The flap advanced and inset. (C) Appearance one year postoperatively.

and leaving the patient with a minimal surgical deformity (Fig. 3A).

Once the incision is made through the full thickness of the dermis, skin hooks are placed on the edges of the wound and blunt scissor dissection is used to dissect the wound edges away from the flap, as well as the flap from its attachments. The leading and trailing edges of the flap are then gently pulled by the skin hooks to determine where the flap is being tethered. Once identified, the flap's attachments are bluntly

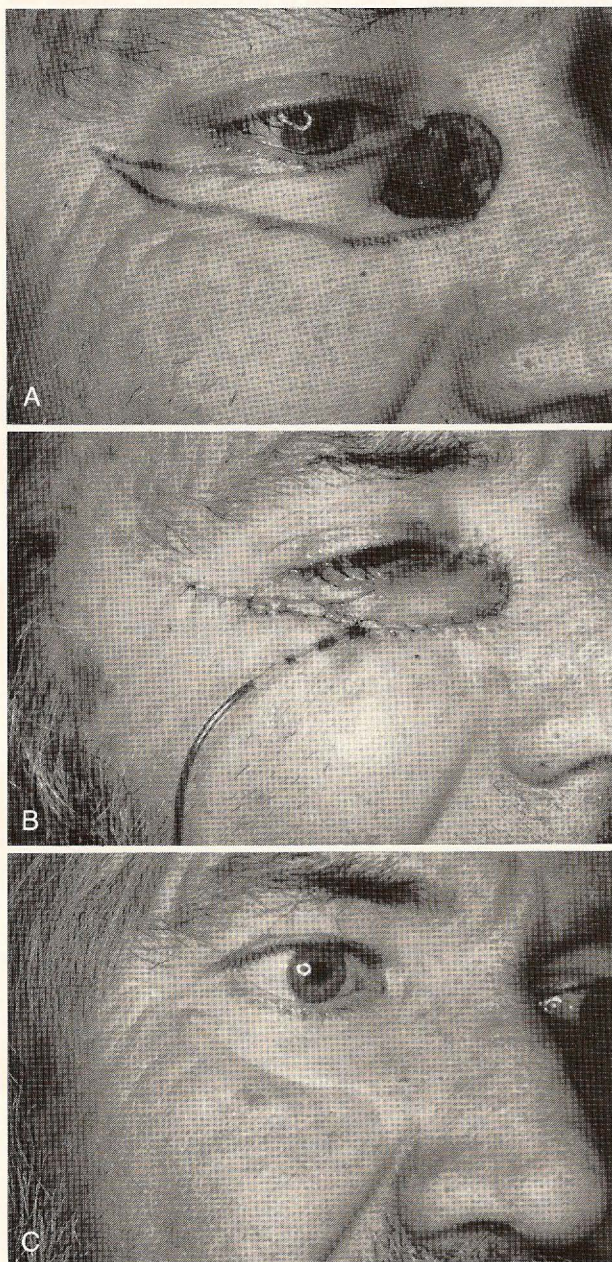


Fig. 4. (A) Medial canthal defect following excision of nodular ulcerative BCC with flap designed over orbicularis oculi muscle. (B) Immediate postoperative appearance with small suction drain in place. (C) Postoperative appearance at nine months.

teased, always keeping in mind that the goal is tension-free advancement with maximum preservation of the underlying subcutaneous pedicle. The edges surrounding the defect also need to be undermined to lessen the distance the flap needs to be advanced. In the malar crescent region, at the junction of cheek and lower-lid skin, a small suction drain may be required (Fig. 4A). In the nasal lobule and alar regions, we have found that the limit of the V-Y flap is a defect approximately 15 mm in diameter (Fig. 5A). Larger

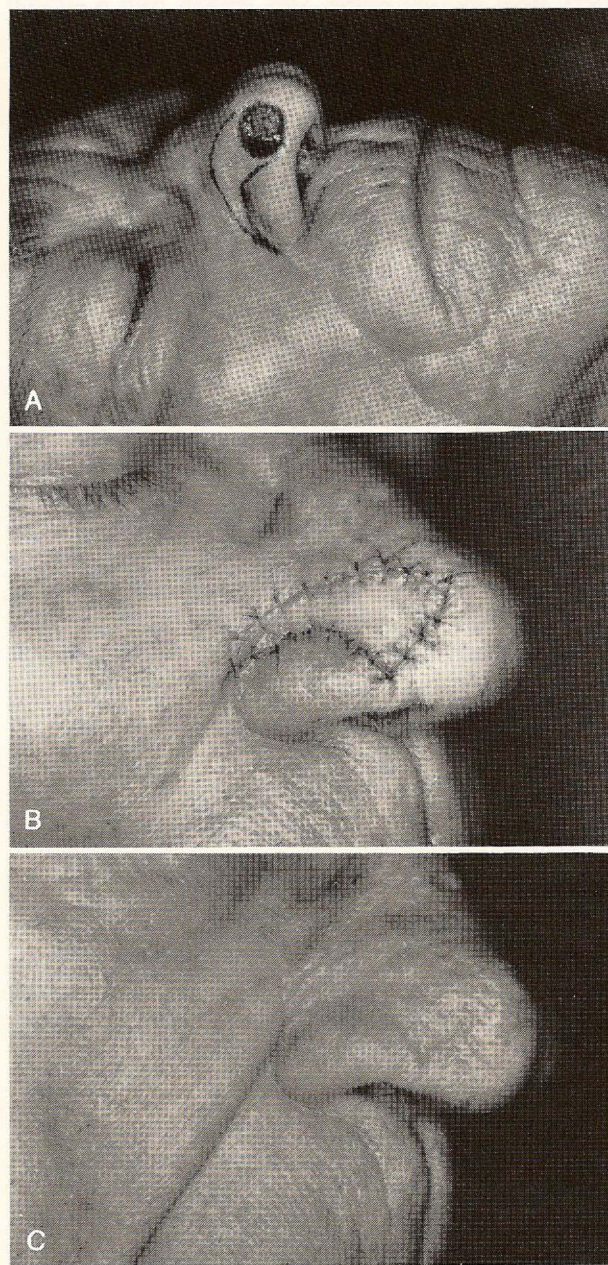


Fig. 5. (A) Defect in lateral lobule with exposed cartilage. Kite flap designed along alar crease and into nasolabial fold. (B) Immediate postoperative appearance. (C) Appearance 13 months postoperatively.

defects would require either a full-thickness skin graft, frontonasal flap [6], or forehead flap. At all times, care must be taken to design the flap properly in order to respect facial lines and shadows.

Results

A total of 43 V-Y advancement flaps have been performed in 40 patients over the past four years. There

have been no flap losses. One patient with a 26-mm defect of the lobule and ala required a combination of a V-Y flap and frontonasal flap. One patient with a distal lobular defect had partial dehiscence which went on to heal satisfactorily by secondary intention. All patients were critically evaluated for color match, preservation of normal facial topography, and visible scars. Thirty-eight of the 40 were found to have good to excellent aesthetic results. One patient had subtle distortion of the alar rim but did not desire correction.

Conclusion

The V-Y advancement flap is extremely reliable when designed and elevated properly and allows for maximal preservation of vascular and lymphatic circulation, thus avoiding the complication of flap edema often seen with transposition flaps. Normal facial topographical lines must be respected when designing the flap, and a tension-free closure with maximal preservation of the underlying subcutaneous or muscular pedicle

should be sought. The flap is particularly suitable for reconstruction of defects of the lower lid and medial canthus, and nasal ala and lobule.

Acknowledgments. The authors wish to acknowledge Susan Hilfer for her illustrations, and Melodie A. Phillips for her editorial assistance and manuscript preparation.

References

1. Borges AF: Relaxed skin tension lines (RSTL) versus other skin lines. *Plast Reconstr Surg* **73**:144, 1984
2. Dufourmentel C, Talaat SM: The kite flap. *Trans Fifth Int Congr Plast Reconstr Surg* p. 1123, 1971
3. Zook EG et al.: V-Y advancement flap for facial defects. *Plast Reconstr Surg* **65**:786, 1980
4. Emmett AJJ: The closure of defects by using adjacent triangular flaps with subcutaneous pedicles. *Plast Reconstr Surg* **59**:45, 1977
5. Rybka FJ: Reconstruction of the nasal tip using nasalis myocutaneous sliding flaps. *Plast Reconstr Surg* **71**:40, 1983
6. Marchac D: *Surgery of Basal Cell Carcinoma of the Face*. Geneva: Springer-Verlag, 1986, p. 43