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PROCEDURAL DERMATOLOGY

Surgical gem: Island advancement flaps for lip reconstruction

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ABSTRACT

Island advancement flaps provide specific advantages for repairing certain defects on the upper lip. We discuss the design and execution of this flap for defects on the alar sill and philtrum.

Key words: advancement, flap, lip, island, pedicle, reconstruction.

INTRODUCTION

Island advancement flaps are a useful reconstructive option for selected facial defects. Formerly referred to as island pedicle flaps and also known as V-to-Y flaps, these local flaps lack a cutaneous connection and therefore are more mobile than advancement or rotation flaps. Their blood supply is provided by a robust subcutaneous vascular pedicle, allowing reliable tissue support since the distance to the vascular pedicle throughout the flap is relatively constant.

There are select locations where the flap is particularly useful on the head and neck. Two areas where the island advancement flap offers unique advantages are the alar sill and philtrum of the upper lip. In these locations the flap follows more closely many of the tenets of successful reconstruction, permitting a more cosmetically elegant repair than other options.

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DESIGN OF FLAP

In designing the island advancement flap an isosceles or curvilinear triangle is planned with the short end of the triangle abutting the surgical defect. The two longer sides of the triangle follow the relaxed skin tension lines, extending into the adjacent tissue from which the flap will be advanced. If possible, at least one of these long sides is placed within the junction of two cosmetic units or subunits, which further assists in concealing one of the surgical incisions. One of the benefits of this flap is that the tissue used to reconstruct the defect is taken immediately adjacent to the surgical defect. Thus, the colour, texture, thickness, degree of sun damage and adnexal content is identical to the missing tissue. Another benefit of utilising tissue within the same cosmetic unit for repair is the proper maintenance of important anatomical landmarks and free margins in their location. The alar sill and philtrum are two locations where other types of repair may distort nearby anatomical locations or free margins. We discuss these situations below.

EXECUTION OF FLAP

Execution of the flap necessitates proper design at the beginning. The triangular flap is incised to the superficial subcutaneous tissue. A skin hook is utilised to test the mobility of the flap into the surgical defect. The leading edge (short side of the triangle) is undermined by blunt and sharp dissection to minimise bulldozing or downward retraction of the flap when it is advanced into the surgical defect. The tail of the flap is likewise undermined to free up the flap and avoid tethering when advanced. Each side is then undermined adequately to facilitate movement, utilising the skin hook to test mobility as undermining proceeds. The key is to permit movement of the flap without jeopardising the vascular pedicle. A useful tip is to angle the tips of the scissors downwards during blunt dissection so that there is less transection of the pedicle base. Once it can be advanced into the surgical defect, the flap is

Figure 1 (a) Preoperative appearance of basal cell carcinoma on alar sill. (b) Surgical defect immediately after Mohs surgery removal of basal cell carcinoma. (c) Alar sill reconstructed using an island advancement flap. (d). Healed appearance 6 months later.

sutured into place with absorbable buried vertical mattress sutures (e.g. 4–0 polyglactic acid). The epidermis is approximated and everted with nonabsorbable simple interrupted or running percutaneous sutures (e.g. 6–0 polypropylene).

LOCATIONS

Two locations on the lip where the island advancement flap provides unique advantages are the alar sill and the philtrum. Defects on the alar sill present a unique challenge in that the alar sill includes a thin isthmus of tissue between the nasal ala and medial cheek that must be reconstructed and not obscured. An advancement or transposition flap from the medial cheek to reconstruct the alar sill or posterior nasal obliterates this isthmus, causing a blunted asymmetric appearance to the melolabial fold as it approaches the alar crease. The island advancement flap transfers tissue to replace and restore the missing isthmus. In addition the adjacent tissue closely corresponds to the colour, texture and thickness of the missing skin, and the incision of the short side and one long side of the triangular flap are well hidden in the junction between cosmetic units (Fig. 1).

Another site on the lip where the island advancement flap may be useful is the philtrum. Defects on the philtrum adjacent to the vermilion may be reconstructed in a side-to-side fashion for defects less than or equal to 50% of the philtral width. For defects between 50–100% of the philtral width an island advancement flap is a useful alternative. The flap is designed with the two long sides of the triangle following the philtral ridges superiorly and coming to a point at the superior philtrum. If necessary the apex of the triangle can be carried onto the base of the columella. After incision and careful undermining of the flap the base is advanced to the vermilion border and sutured into place. If the surgical defect involves vermilion in addition to the philtrum, the defects should be closed in cosmetic subunits with the island advancement flap reconstructing the cutaneous philtrum and a possible mucosal advancement flap repairing the vermilion (Fig. 2).

Figure 2 (a) Preoperative view of basal cell carcinoma on mid-upper lip. (b) Surgical defect after a six-stage Mohs procedure. The tumour involved the cutaneous lip at the philtrum as well as the vermilion lip. (c) Cutaneous lip (philtrum) repaired with an island advancement flap and vermilion reconstructed with a bilateral vermilion rotation flap. (d) Healed appearance at 6 months. Small hypertrophic scar to be treated with intralesional steroids.

CONCLUSION

The island advancement flap is a useful reconstructive technique for repairing defects on the upper lip, in particular defects involving the alar sill or philtrum. Through the utilisation of adjacent tissue for the repair, the placement of one or more incision lines at the junctions of cosmetic units/subunits and avoidance of a deviation of anatomical landmarks and free margin, the flap provides an excellent aesthetic repair in selected circumstances.