Infraglabellar Transnasal Bilobed Flap in the Reconstruction of Medial Canthal Defects

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We investigated the effectiveness of reconstruction using an infraglabellar bilobed flap of transnasal skin and subcutaneous tissue for patients with medial canthal defects. Our noncomparative interventional case series involved 11 consecutive patients with medial canthal defects following Mohs micrographic excision of basal cell carcinoma. The medial canthal area was divided into 3 zones: zone 1, just above the medial canthal tendon; zone 2, centered on the medial canthal tendon; and zone 3, just below the medial canthal tendon. Primary closure was achieved easily with a good cosmetic result for all 3 zones. There were no complications or further procedures required. The outcome measures documented clinically and photographically included complete closure of the defect, cosmetic appearance, complications, and further surgery.

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Reconstruction of medial canthal defects is an oculoplastic challenge to attain the optimal surgical and cosmetic result. Several techniques have been described: simple laissez-faire for small defects, which risks hypertrophic scarring1,2; skin grafts; and rotation or transposition flaps. The surgical dilemma comes from the quality of the skin removed and the thickness of the tissue available for replacement. The glabellar transposition flap is commonly used3, but its thickness is often cosmetically unsightly. Several medial forehead flaps also introduce thick skin4,5 but similarly narrow the glabellar region.

An ideal rotation flap involves skin of the same epidermal characteristics as the medial canthal area. The dorsum of the nose has this advantage, and techniques using V-Y advancement flaps6,7 rhomboid flaps8, or rotational-transnasal advancement flaps9,10 are described. However, the first technique does not obey natural relaxed skin tension lines, and the third is limited to small defects; only the rhomboid flap gives good cosmesis.8

The bilobed flap is a commonly used rotational flap for plastic reconstruction especially in situations with tight skin, eg, dorsum of the nose, sole of the foot. It was originally described in 1918 by Esser11. Its oculoplastic use has been limited to reconstruction of anterior lamella defects of the lower eyelid12 and medial canthal defects by Sullivan and Bray13, who took the primary lobe from the dorsum of the nose and secondary lobe predominantly from the glabellar region.

We describe a series of patients who underwent successful reconstruction of Mohs medial canthal defects with an infraglabellar transnasal bilobed rotation flap.

METHODS

Eleven consecutive adult patients underwent medial canthal reconstruction with an infraglabellar transnasal bilobed rotational flap, with their data collected prospectively. All patients had biopsy-proven basal cell carcinoma prior to Mohs micrographic surgery. The tumor size was assessed in 2 axes before and after the Mohs surgery. The reconstruction was undertaken by the Oculoplastic and Orbital Service at our hospital the day after the Mohs excision. Surgery was under local anesthesia without sedation in all cases. The patients were treated on an outpatient basis. Information was recorded on the size of tumor, size of Mohs defect, cosmetic re-
Surgical Technique

The flap is made from the dorsum and contralateral aspect of the nose, taken across horizontally oriented relaxed skin tension lines. The angle between the 2 lobes varies from 30° to 90°. The primary lobe diameter must be similar to the vertical length of the defect. The secondary lobe is half the size of the primary (Figure 1) and is slid into the defect created by rotating the primary lobe. The axis of rotation is closer to the first than the second lobe, thus introducing an element of advancement to the rotation. The skin and subcutaneous tissue on the dorsum of the nose are undermined widely, and a radial relieving incision may be made at the distal end of the secondary lobe to aid rotation.

The bilobed flap is marked on the skin, starting with a line perpendicular to the superior boundary of the defect (Figure 2 A and B). We inject subcutaneously a solution of 50% bupivacaine 0.5% and 50% lignocaine 2% with epinephrine (concentration, 1 in 200,000) and then apply firm pressure for 3 to 5 minutes. The flap boundaries are cut with a scalpel (Figure 2C), dissected, and mobilized with blunt scissors beneath the flap and across the dorsum of the nose. The flap is raised to the level of the subcutaneous fat layer. Gentle cautery is performed under the flap (Figure 2D). The flap is rotated and positioned in the defect (Figure 2E and F). Three deep polyglycolic-acid sutures (Dexon; Ethicon, Livingston, Scotland) are placed to position the flap with minimal tension. The skin margins are sutured with interrupted 6/0 Prolene (polypropylene; Ethicon) (Figure 2G). The area is padded with Jelonet dressing (Paraffin Gauze BP; Smith & Nephew Healthcare Ltd, Hull, England), dental rolls (Dentstar, London, England), and double ocular pads (Johnson & Johnson, Ascot, England) to achieve adequate compression. The sutures are removed after the skin edges heal (usually in 1 week). Topical antibiotic ointment is applied twice daily for 1 week.

The medial canthal area was divided into 3 zones (zone 1 being just above the medial canthal tendon; zone 2, centered on it; and zone 3, just below it) (Figure 3) based on the Mohs surgeons’ excision map and the defect assigned to the zone in which it lay. The zones may be easily identified in relation to the medial canthal tendon on a horizontal line defining zone 2. A single defect could occupy all 3 zones. The rationale for using 3 zones is that it allows the simplest dissection of the medial canthal area for classification of the defects to plan secondary reconstruction.

Results

There were 11 patients (5 men, 6 women) with a mean age of 73 years (range, 42-89 years). The mean follow-up time was 21 months (median, 24 months). This value is skewed because 1 patient died from an unrelated illness at 3 months. Surgery was performed 1 day after the Mohs micrographic excision.

The mean size of the tumor was 7.4 × 6.2 mm; mean size of the defect was 15 × 12.3 mm (Table). The defects were primarily in zone 2 (6 patients); 1 in zone 1, above the medial canthal tendon; and 4 in zone 3, below the medial canthal tendon.

Primary closure was achieved in all cases without complications. In 2 cases, the bilobed flap creation was performed in combination with upper eyelid and cheek advancement and pericranial flap formation to fill the deep lamella. We also assessed the lacrimal system: if the canaliculus was excised with the Mohs surgery, the distal end close to the sac was occluded and the remaining intact canaliculus drained tears under the flap. If the canaliculus was partially missing but a short distal portion remained, it was marsupialized into the conjunctival fornix. In all cases, the cosmetic appearance was highly satisfactory to the surgeon and patient (Figure 4).

The surgeon grade varied from consultant (7 cases) to fellow (3 cases) to resident (1 case). There was no postoperative webbing, but 1 case had slight blunting of the medial canthal angle. There was no reoperation, infection, hemorrhage, graft...
COMMENT

In this series, we demonstrate the effective use of the infraglabellar transnasal bilobed flap for medial canthal reconstruction. Mohs micrographic surgery in the medial canthal area spares tissue and achieves a high cure rate. However, the complete excision of a tumor may involve removing deeper tissue to ensure adequate clearance. In this milieu, a free, full-thickness skin graft may be cosmetically unsatisfactory owing to inadequate filling of volume of the defect; a risk of color mismatch; graft shrinkage with distortion by webbing or banding; rarely, necrosis from an impaired local blood supply; and hypopigmentation or hyperpigmentation with time. Flaps are favored.

The bilobed flap originally consisted of a flap of 2 lobes of the same size, angled at 90° and 180° to the site of the defect. Later, McGregor and Soutar classified the bilobed flap into 2 types: type 1 with a center of rotation in the second lobe, primarily a rotational flap, and type 2 with the center of rotation between the 2 lobes, making it both a rotational and advancement flap. In this series, the bilobed flap was type 2, consisting of skin and subcutaneous tissue.

Figure 2. Formation of a bilobed flap. A, Defect after a Mohs resection. B, Marking the flap. C-E, Flap dissection and hemostasis control. F and G, Rotation of flap and suture.
Table. Size of Tumor and Defect After Mohs Resection

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Figure 3. Grading medial canthal tendon defects into zones 1, 2, and 3 based on relationship to the medial canthal tendon on a horizontal line. Zone 1 is just above the medial canthal tendon; zone 2, centered on the medial canthal tendon; and zone 3, just below the medial canthal tendon.

Figure 4. Two patients in the study showing the defect after a Mohs resection (A and B) and 4 months postoperatively (C-F).
rotated (and partially advanced) into the adjacent defect, with a large first lobe and smaller second lobe. The amount of tissue distortion may be overcome by ensuring that the width of the first lobe is the same size as the defect and by defining the rotational angle of the first lobe with the second 90° to 100° from the defect. The bilobed flap has its own blood supply; therefore, there is rapid healing and a low risk of necrosis and infection.

Previously described techniques using the bilobed flap for medial canthal reconstruction have taken the second lobe from the glabellar region as opposed to the infraglabellar second lobe from the glabellar reconstruction and provide a variety of grades of tissue distortion. The skin of the secondary defect will be uniform because tissue would be rotated from skin with a similar thickness. The healing of the scar from the transnasal secondary lobe follows the natural lines of the nasal bridge; hence, it is easily disguised and avoids leaving a vertical scar in the glabellar region, which may be more difficult to conceal. By altering the size of the angle between the lobes, the surgeon is able to vary the tension on the rotational graft. In our series, the secondary flap needed to be only half the diameter of the first flap to achieve adequate closure of the defect. Other authors have described the successful use of the bilobed flap in facial lesions (not periorbital) after trauma and tumor resection using similarly sized primary and secondary lobes.

The advantage of using a smaller secondary lobe flap is that less tissue has to be removed from the “normal” contralateral side. At the end of surgery, the contralateral nostril may be temporarily pulled up, but this settles rapidly. The rotational angle of the lobe contributes to the tissue distortion formed.

By assessing medial canthal defects into zones (Figure 3), the surgeon can decide which flap or combination of flaps is appropriate. The zones are identified from the Mohs map showing excision of the tumor. In assessing an appropriate flap, a surgeon must consider skin thickness, texture, and elasticity; subcutaneous tissue characteristics; muscles; the volume of tissue transposed; and skin tension lines for the selected flap. If the defect after resection was mainly in zone 1, the surgeon may choose a combination of upper eyelid advancement flaps, an inverted V-Y flap for the glabellar region, and a transnasal bilobed flap for the more inferior part. If the defect was mainly in zone 3, a bilobed flap may be combined with a cheek advancement, as in 1 of our cases, or with a lower eyelid advancement flap.

We demonstrated that the infraglabellar transnasal bilobed flap is simple and effective for medial canthal reconstruction and provides good cosmesis. The scar is largely horizontal across the bridge of the nose in a relaxed skin tension line and diminishes in its visibility with time. There are minimal complications with this flap, and it may be used in combination with other periorbital reconstructive procedures. It can be easily performed under local anesthesia with good results achieved by a variety of grades of surgeons.

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REFERENCES