Reconstructing Discontinuous Facial Defects with Simultaneous Ulnar Perforator Free Flaps

Carissa M. Thomas, MD, PhD*
Mofiyinfolu Sokoya, MD*
Frederic W.-B. Deleyiannis, MD, MPhil, MPH†

Summary: Multiple, simultaneous skin cancers of the face are common. This is the first description of reconstructing discontinuous facial defects (i.e., separate sites of the face) with simultaneous ulnar perforator flaps. The distinct innovations of this multiple flap design are the ability to restrict the harvest site to one extremity, to obtain vein and arterial grafts from the same extremity, and to create multiple flaps with minimal hirsutism and bulk. We present a case of a 57-year-old male with multiple basal cell carcinomas who underwent wide local excisions of the right upper lip and cheek and of the left lower eyelid and infraorbital cheek. Two left-sided ulnar perforator free flaps were used for reconstruction with the outcome of normal oral competence and eyelid function. When faced with discontinuous facial defects, reconstruction with simultaneous ulnar perforator flaps is a useful option because of the advantages of matching the thinness and pliability of the resected skin, reducing the number of harvest sites and preventing the distortion and contraction that can be seen with local advancement flaps or skin grafts. (Plast Reconstr Surg Glob Open 2017;5:e1291; doi: 10.1097/GOX.0000000000001291; Published online 7 April 2017.)

INTRODUCTION

Cutaneous defects that include multiple, continuous facial subunits (i.e., eyelid and cheek; lip and cheek) can potentially be reconstructed with local advancement-rotation flaps, skin grafts, or some combination of these options. Reconstruction with a fasciocutaneous free flap has the advantage of an improved blood supply and less distortion and contraction of the surrounding tissue. This is particularly relevant if there is a high risk of eyelid malposition (i.e., ectropion) secondary to an inferior vector caused by superior advancement of a cervicofacial flap or if lateral displacement of the oral commissure, superior elevation of the lip, or eversion of oral mucosa is anticipated with medial or inferior advancement of a cheek flap. Among the microvascular options, the ulnar fasciocutaneous free flap is perhaps the best choice due to decreased hirsutism, an inconspicuous location, preservation of dominant arterial blood supply to the hand, and thinness.1–4

Multiple, simultaneous skin cancers of the face are common. This is the first description of reconstructing discontinuous facial defects (i.e., separate sites of the face) with simultaneous ulnar perforator flaps. We present this technique, its relative advantages over other reconstructive options, and the microvascular considerations for the second flap.

CASE

A 57-year-old male presented with 2 basal cell carcinomas involving the left infraorbital cheek and lower eyelid and the right upper lip and medial cheek. Wide local excision resulted in discontinuous facial defects: an approximate 7 × 4.5 cm defect of the skin of the left cheek and eyelid and an approximate 5.5 × 4 cm defect of the right upper lip and cheek (Fig. 1). His medical history was significant for severe peripheral vascular disease, and bilateral Allen’s tests demonstrated insufficient refill (greater than 15 seconds). Allen’s test is defined as the simultaneous compression of the radial and ulnar arteries followed by release of the ulnar artery and determining time until the hand regains a normal pink color while compression on the radial artery is maintained. A normal test takes less than 5 seconds.5,6 Two left-sided ulnar fasciocutaneous free flaps were planned for reconstruction. Once the distal skin paddle had been raised (Fig. 2A), the ulnar artery was dissected proximally to identify any proximal perforators on which
A second free flap could be based. A single additional perforator was found (Fig. 2B). The pedicle of the distal flap was divided 7 cm from the take-off of the proximal perforator and inset into the left cheek/eyelid defect. Anastomoses were done from the ulnar artery and 1 vena comitans to the left superficial temporal artery and vein. For a second venous anastomosis, the basilic vein was tunneled to the left external jugular vein. To provide length to the pedicle of the proximal ulnar perforator flap, the ulnar artery (i.e., the 7-cm segment distal to the take-off of the proximal perforator) and a 7 cm-segment of the left cephalic vein were harvested as grafts, anastomosed to the right facial artery and vein, and tunneled to the right lip/cheek defect to allow inset of the second free flap (Fig. 3). The patient healed well with normal oral competence (i.e., no microstomia or mucosal eversion) and no donor-site complications (i.e., failure of skin graft, ulnar nerve neuropathy). At his last follow-up, the patient had very slight ectropion of the left lower eyelid but was without epiphora or dry eye symptoms (Fig. 4). No debulking procedure has been recommended or requested by the patient.

DISCUSSION

This is a novel presentation of using 2 ulnar perforator flaps from the same arm to reconstruct simultaneous but discontinuous facial defects. Ulnar perforators (A, B, and C) can be classified based on distance from the pisiform to the epicondyle. On average, perforator A is located approximately 7 cm from the pisiform, perforator B is 4 cm proximal to A, and perforator C is 4.5 cm proximal to B. A majority of patients have 3 perforators (61%) with the remainder having 2.7,8

Fig. 1. Resultant facial defects following wide local excision of 2 separate basal cell carcinomas.

Fig. 2. Design of simultaneous ulnar perforator free flaps. A, Distal flap elevated; skin paddle of the proximal flap incised. B, Both flaps elevated. The proximal flap is based on a single perforator. The basilic vein, cephalic vein, and the redundancy in the vascular pedicle distal to the proximal perforator were all options for grafts to extend the length of the vascular pedicle of the proximal flap.

Fig. 3. Appearance after the inset of both ulnar free flaps. The anastomosis of the proximal flap was done to the right facial artery and vein above the mandible after grafting.
Multiple, simultaneous skin cancers of the face are frequently encountered. Patients who require resection of multiple facial subunits often benefit from free tissue transfer. Designing 2 free flaps from separate perforators that arise from the same vascular pedicle is one method for reducing the number of harvest sites and donor-site morbidity. The possibility of limiting the harvest site to 1 extremity could be applied to lateral or medial thigh flaps based on separate perforators arising from the descending circumflex, transverse circumflex, profundus, or superficial femoral system. However, these possible thigh flaps would likely be substantially thicker than the resected facial skin and would require additional procedures for debulking. Two radial forearm free flaps from the same arm based on separate perforators could also be designed. However, compared with an ulnar free flap, the increased hirsutism makes a radial forearm free flap less desirable for reconstructing facial defects. If the radial artery is the dominant blood supply to the hand, the ability to maintain this blood supply is another advantage of harvesting an ulnar free flap. This is especially important in patients with reduced blood flow secondary to peripheral vascular disease. This ulnar free flap technique is especially useful for non-hair–bearing zones of the face, particularly, the forehead, check, or any area where a local advancement-rotation flap might cause morbidity secondary to contraction or tension.

The main disadvantage of designing multiple perforator flaps is the short pedicle of the proximal free flap. However, as illustrated by this case, multiple grafts, both venous and arterial, can be harvested to reach the vessels in the neck (Fig. 2, lower panel). No additional harvest sites are needed because these grafts are already exposed in the operative field.

CONCLUSIONS

When faced with discontinuous facial defects, reconstruction with simultaneous ulnar perforator free flaps is a useful option because of the advantages of matching the thinness and pliability of the resected skin, limiting the donor site to a single extremity, and preventing the distortion and contraction that can be seen with local advancement-rotation flaps or skin grafts.

Frederic W.-B. Deleyiannis, MD, MPhil, MPH, Division of Plastic Surgery Departments of Surgery and Otolaryngology Children’s Hospital Colorado and University of Colorado School of Medicine 13123 East 16th Avenue, B467 Aurora, CO 80045 E-mail: frederic.deleyiannis@childrenscolorado.org

PATIENT CONSENT

The patient provided written consent for the use of his image.

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