Quaba Flap for Reconstruction after Cancer Resection of an Amputated Finger Stump

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The dorsal metacarpal artery (DMA) perforator flap is a vascular island flap raised on the dorsum of the hand for coverage of finger soft tissue defects. The typical application of this flap is resurfacing the dorsal defect of the finger proximal to the fingertip. The authors present a case that extends the indication for a DMA perforator flap to include resurfacing the stump of an amputated finger.

A 76-year-old woman had an intractable ulcer on the stump of her right second finger (►Fig. 1). At the age of 2 years, she suffered a severe burn on her right five digits and underwent surgical amputation of all injured digits at the midlevel of the proximal phalanxes. With a diagnosis of squamous cell carcinoma on biopsy, the tumor was resected to leave an intact margin 5 mm from the border. The stump

of the proximal phalanx was exposed after the tumor resection. To repair this defect, a second DMA perforator flap was designed in a 7- × 2.5-cm spindle shape. The flap involved a direct skin perforator at the level of the metacarpal neck in the second intermetacarpal space. The flap was elevated, preserving the paratenon of the extensor tendons (►Fig. 2). This perforator-based island flap was rotated 180 degrees

Fig. 1 Skin ulcer on the stump of the right second finger.

Fig. 2 Elevation of the flap. The arrows indicate the perforator branches of the second dorsal metacarpal artery.

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into the defect. An additional incision to place the flap was made on the ulnar midlateral line of the second finger. The donor site was directly sutured (►Fig. 3). The flap took successfully with no complications as of 8 months postoperatively (►Fig. 4).

The present case involves three points as a reconstructive problem. First, use of a reverse vascular pedicle flap requires careful consideration because this type of short amputated finger may have a deficiency of communicating branches. Second, pedicle flaps from the first, third, fourth, or fifth digit, in a mode similar to a kite flap, are not available because these digits are also amputated. Last,

the patient complains of so much pain in the stump that it is not recommended to use the flaps adjacent to the defect. For example, V-Y advancement flaps may complicate the stump pain by transferring the amputation neuroma to the distal end.

The common flaps for fingertip reconstruction would be a neurovascular pedicle V-Y advancement flap or a reverse neurovascular pedicle island flap. These flaps have a benefit as sensory flaps. However, in the case of a short amputated finger stump, applying these flaps is difficult. The pedicle of the V-Y advancement flap becomes very short, and it may restrict flap advancement. Moreover, the stump pain may be

Fig. 3 Completion of the surgery observed from the dorsal (A) and palmar (B) sides.

Fig. 4 Eight months after surgery observed from the dorsal (A) and palmar (B) sides.

worsened, as described previously. Because a reverse island flap requires a communicating branch to the opposite side of the digital artery, it is not available for an amputated finger shorter than the proximal interphalangeal joint. Therefore, flaps of the DMA system are recommended for reconstructing short amputated finger stumps.

The DMA perforator flap was first described by Quaba and Davison¹ for resurfacing soft tissue defects of the fingers. The reliable distal range of the flap is up to the proximal half of the middle phalanx.² The most reliable cutaneous perforator branch to harvest the second DMA perforator-based propeller flap is situated 1 cm proximal to the second metacarpal head.³ One of the advantages of the Quaba flap is preservation of the DMA when it is used as a perforator-based propeller flap. The DMA flap can be used as the reverse vascular pedicle flap by dissecting the DMA proximal to the cutaneous perforator.^{2,4} However, the reverse flap ought not to be used if concern remains about whether the anastomosis with the common digital artery is intact. Another advantage of the Quaba flap is technical facility. The main operator was a resident who had only 1 year of experience in plastic surgery. She accomplished the elevation and transposition of the flap within 30 minutes under the specialist's guidance. The

disadvantage of the Quaba flap is lack of sensory reconstruction. However, the patient has no problem pinching or grasping an object and was satisfied with becoming free of pain, rather than complaining of a sensory disturbance.

A Quaba flap is a simple and safe reconstruction method for the finger, and it is usually applied to a partial defect proximal to the fingertip. This case extends the indication for a Quaba flap to include resurfacing the stump of an amputated finger.

Conflict of Interest

None.

References

- 1 Quaba AA, Davison PM. The distally-based dorsal hand flap. *Br J Plast Surg* 1990;43(1):28–39
- 2 Sebastin SJ, Mendoza RT, Chong AK, et al. Application of the dorsal metacarpal artery perforator flap for resurfacing soft-tissue defects proximal to the fingertip. *Plast Reconstr Surg* 2011;128(3):166e–178e
- 3 Omokawa S, Tanaka Y, Ryu J, Kish VL. The anatomical basis for reverse first to fifth dorsal metacarpal arterial flaps. *J Hand Surg [Br]* 2005;30(1):40–44
- 4 Maruyama Y. The reverse dorsal metacarpal flap. *Br J Plast Surg* 1990;43(1):24–27