

EDUCATIONAL SECTION

Fillet of finger flap for hand resurfacing after tumour excision

F. Schonauer, D. Schaden and T. C. Teo

Department of Plastic Surgery, The Queen Victoria Hospital, East Grinstead, UK

Introduction

Finger fillet flaps are commonly used to cover dorsal hand skin defects after traumatic injuries.¹⁻⁷ We report the case of a large squamous cell carcinoma on the dorsum of the hand, extending to the wrist and infiltrating into the metacarpal bones. The tumour was excised and the fourth and fifth bone rays were amputated. Ring and little finger filleted were used to cover the dorsal defect.

Case report

A 72-year-old man was referred to us with a 4-year history of a growing lesion on the dorsum of his non-dominant left hand. On examination this 10-cm ulcerating lesion was fixed and had the clinical appearance of a deeply infiltrating squamous cell carcinoma (Fig. 1). Regional lymph nodes were not palpable. Pre-operative X-rays showed infiltration of the fourth and fifth metacarpal bones.

Surgery was performed under regional anaesthesia and an arm tourniquet was used without compressive exsanguination to avoid the risk of tumour dissemination. The tumour had infiltrated between the extensor tendons into the base of the fourth and fifth metacarpal bones. An *en bloc* radical resection was therefore performed which included a 1-cm skin margin, the involved ring and little finger extensor tendons and the 4th and 5th metacarpals.

Dorsal longitudinal incisions were made down to the skeleton of ring and little finger from a point above the MCP joint to 5 mm proximal to the nail fold. At the distal end, a circumferential incision was made around both fingers.

The fillets of the ring and little finger were raised (Fig.



Fig. 1. Infiltrating squamous cell carcinoma of the left hand.

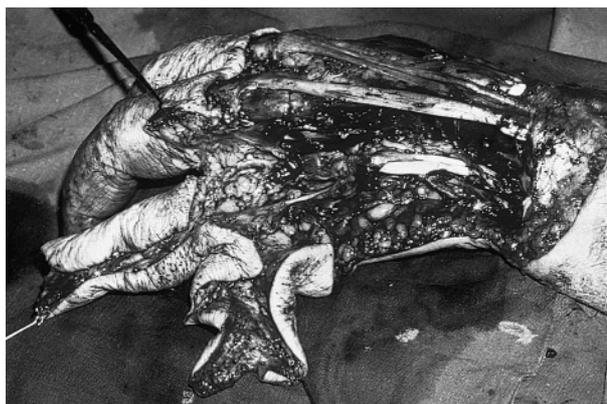


Fig. 2. Surgical resection; fillet of finger flaps from ring and little finger.

2) and reflected dorsally to cover the wound. The fourth and fifth bone rays were not salvaged. To lengthen the flaps, the common palmar neurovascular bundles to the ring and little finger were isolated proximally until their branching from the superficial palmar arch. The common digital nerves to the middle and ring fingers and to the ring and little fingers were split by intraneural dissection, preserving sensation to all areas of the two flaps.

Correspondence to: Fabrizio Schonauer, Registrar in Plastic Surgery, The Queen Victoria Hospital, East Grinstead, West Sussex, RH19 3DZ, UK. Fax: 01342 317907.

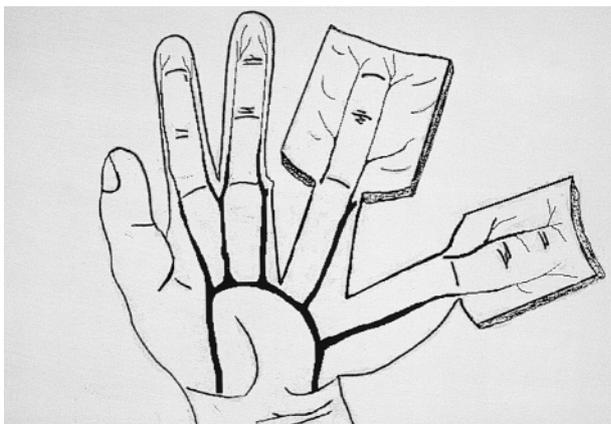


Fig. 3. Blood supply to the flaps.

The ring finger fillet flap, measuring 10×5 cm, was used to cover the distal part of the defect, while the little finger fillet flap, sized 9×4.5 cm, covered the proximal portion of the wound up to the dorsum of the wrist. The residual defect, over the first dorsal interosseus muscle, was covered with a split skin graft. The reconstructed hand was mobilized, once the graft was stable, at 10 days.

Histology showed a deeply invasive, moderately



Fig. 4. 12 months follow-up: resurfacing of the dorsum and wrist.

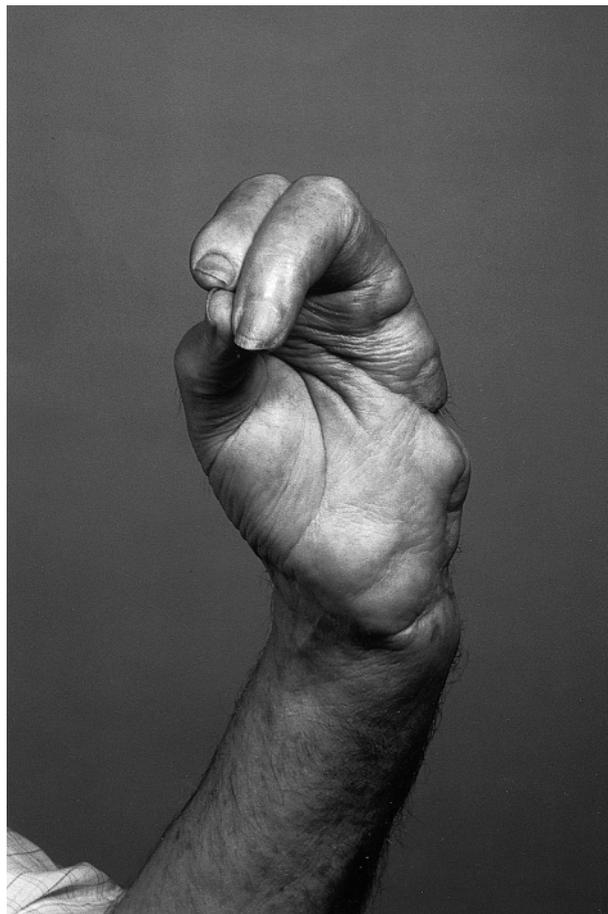


Fig. 5. Functional result.

differentiated squamous cell carcinoma, locally completely excised.

Follow-up after 12 months showed no locoregional recurrence. The function of the left hand remained good, with preservation of pinch and tripod grip (Fig. 3). Sensation on the dorsum and the ulnar border of the narrowed hand was excellent. The cosmetic result was satisfactory (Fig. 4).

Discussion

Several possibilities for the coverage of dorsal hand defects have been reported, including skin grafts, local flaps, pedicled flaps and free flaps.⁸

Distally based radial and ulnar pedicled flaps⁹⁻¹¹ are commonly used for the treatment of dorsal hand defects, but each of these sacrifices a major vascular supply to a hand that is already compromised. Other forearm pedicled flaps that can reach the dorsal hand have been described, such as the posterior interosseus flap¹² and the Becker flap.¹³ Amongst the distant flaps, the groin flap is commonly chosen for its ready availability, ease of harvesting and an inconspicuous donor site.¹⁴ However its use enforces prolonged dependency of the hand predisposing it to swelling and stiffness. Free muscle flaps have been employed for soft-tissue reconstruction but they tend to be bulky and

require subsequent thinning. The dorsalis pedis free flap is thin and has the advantage of allowing the inclusion of vascularized tendons.¹⁵ However, the donor site morbidity remains the greatest deterrent against the use of this flap.

The free temporal fascia flap¹⁶ covered by split thickness skin graft has been proposed for hand defects; the replacement of the mobile dorsal skin gives satisfactory results, both functionally and cosmetically. The major disadvantages of this free fascial flap are its limited size and a meticulous dissection that requires time.

The use of finger fillet flap to cover dorsal hand defects after injuries is well described.¹⁻⁷ However, we are not aware of any report of the use of this type of flap to cover a dorsal hand and wrist defect following tumour resection.

The main advantages of the finger fillet flaps are their excellent sensibility, durable coverage, colour match of the skin and the absence of a donor site defect. A combination of finger fillet flaps, when possible, provides coverage to the dorsal hand superior to that of skin grafts or distant flaps.

In our patient, flaps were composed of healthy tissue which otherwise would have been lost. The neurovascular bundles to the ring and little finger were dissected into separate units. That allowed the flaps greater freedom and length to reach the extensor aspect of the hand and the wrist.

In our opinion, finger fillet flaps can be used to cover the dorsal hand in selected cases in which the finger bones cannot be salvaged but the palmar skin is safe and the neurovascular bundle is still intact.

References

1. Al-Qattan MM. Lengthening of the finger fillet flap to cover dorsal wrist defects. *J Hand Surg* 1997; **22**: 550-1.
2. Cave EF, Rowe CR. Utilization of skin from deformed and useless fingers to cover defects in the hand. *Ann Surg* 1947; **125**: 126-7.
3. Chase AR. The damaged index digit. *J Bone Joint Surg* 1968; **50**: 1152-60.
4. Goitz RJ, Westkaemper JG, Tomaino MM, Sotereanos DG. Soft tissue defects of the digits. *Hand Clinics* 1997; **13**: 189-204.
5. Koegel AM, Banducci DR, Kahler SH, Hauck RM, Mander EK. Sensibility of finger fillet flaps on late follow-up evaluation. *J Hand Surg* 1995; **20**: 679-82.
6. Lister GD. Skinflaps. In: Green DP (ed.) *Operative Hand Surgery, Vol. 2*. 3rd ed. USA: Churchill Livingstone, 1983: 1779-82.
7. Peacock EE. Reconstruction of the hand by the local transfer of composite tissue island flaps. *Plast Reconstr Surg* 1960; **25**: 298-311.
8. Sundine M, Schecker LR. A comparison of immediate and staged reconstruction of the dorsum of the hand. *J Hand Surg* 1996; **21**: 216-21.
9. Mih AD. Pedicle flaps for coverage of the wrist and the hand. *Hand Clinics* 1997; **13**: 217-29.
10. Soutar DS, Tanner NSB. The radial forearm flap in the management of soft tissue injuries of the hand. *Br J Plast Surg* 1984; **37**: 18-26.
11. Guimberteau JC, Goin JL, Panconi B, Schuhmacher B. The reverse ulnar artery forearm island flap in hand surgery: 54 cases. *Plast Reconstr Surg* 1988; **81**: 925-32.
12. Zancolli EA, Angrigiani C. Posterior interosseus island forearm flap. *J Hand Surg* 1998; **13**: 130-5.
13. Becker C, Gilbert A. The ulnar island flap. In: *The Hand: Tubiana, Vol. 3*. 149-51.
14. McGregor IA, Jackson IT. The groin flap. *Br J Plast Surg* 1972; **25**: 3-16.
15. Caroli A, Adani R, Castagnetti C, Pancaldi G. Dorsalis pedis flap with vascularized extensor tendons for dorsal hand reconstruction. *Plast Reconstr Surg* 1993; **92**: 1326-30.
16. Hirase Y, Kojima T, Bang HH. Double-layered free temporal fascia flap as a two-layered tendon-gliding surface. *Plast Reconstr Surg* 1991; **88**: 707-12.