



## A new cutaneous flap: snuff-box flap

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**SUMMARY.** A new cutaneous flap, the snuff-box flap, from the dorsal surface of the hand, was developed and we have used it as a free flap in 4 cases and as a pedicled flap in one case, with favourable results.

### Anatomy and surgical technique

We studied the anatomy of the vicinity of the anatomical snuff-box on the dorsum of the hand during surgical procedures and confirmed that a few cutaneous perforators are given from the radial artery at this site. This suggests that the radial artery can provide sufficient flow to an area of skin if it is small. Companion drainage veins usually run alongside the radial artery, but if the cephalic vein shows more favourable drainage, it may be used for drainage.

Prior to raising the flap, it is important to confirm the flow in the radial artery by a Doppler flow monitor and to perform an Allen test. The long axis of the flap is designed to incline slightly towards the ulnar side, so that only about half of the flap overlies the snuff-box. This permits easy direct closure of the donor site (Fig. 1).

When the margins of the flap are incised, dissection proceeds towards the snuff-box from the distal end immediately superficial to the interosseous muscle, preserving the tendon sheath of the extensor pollicis muscle and as much of the superficial branch of the radial nerve as possible, but including the cephalic vein if desired. An incision of the forearm is then made so the radial artery and venae comitantes can be dissected for the pedicle. Finally, in the snuff-box the distal end of the radial vascular bundle is ligated and all soft tissue is separated just above the periosteum. The maximum width of the donor site for direct closure is about 3.5 cm in adults. The wrist was splinted in extension for about 2 weeks postoperatively.

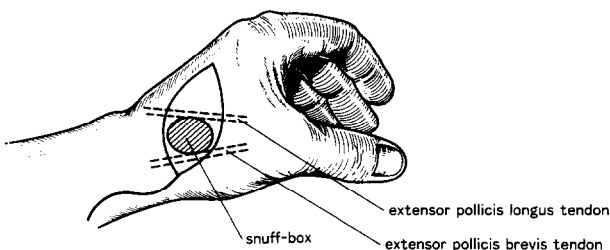


Fig. 1

Figure 1—The design of the snuff-box flap.

Table 1 List of reconstructions using snuff-box flaps

Case no.	Age	Sex	Site	Free or pedicled	Flap size (cm)
1	67	M	nose	free	3 × 6
2	60	M	hand	free	3 × 6
3	59	F	carpus	pedicled	3.5 × 6.5
4	32	M	nose	free	3.5 × 6
5	24	M	thumb	free	3 × 6.5

### Case reports

We used snuff-box flaps as free flaps in 4 cases and as a pedicled flap in one case (Table 1). Results were satisfactory in all. Representative cases are presented.

#### Case 1

A 67-year-old man presented with basal cell carcinoma of the left ala (Fig. 2). Excision resulted in a full thickness defect. A free snuff-box flap 3 × 6 cm was designed on the left hand (Fig. 3). Although a cephalic vein was also preserved with the flap, a vena comitans was eventually used for anastomosis. End-to-end anastomosis with the facial artery and vein was performed and complete survival of the skin flap was achieved. Six months after operation, there was good colour and texture of the flap (Fig. 4). The scar at the donor site was also unobtrusive, and no sensory or functional disturbance occurred (Fig. 5).

#### Case 2

A 60-year-old man presented with a skin defect on the left dorsal surface of his hand caused by an industrial injury, with the extensor tendon of his third finger exposed (Fig. 6). A 3 × 6 cm snuff-box flap was harvested from the contralateral hand (Fig. 7) and the donor site closed primarily. Vascular anastomoses at the level of the snuff-box were done on the affected side. Six months after surgery, the flap is satisfactory in terms of colour and texture (Fig. 8) and no functional disturbance is observable at the donor site.

### Discussion

The snuff-box flap has the advantages of being thin, of having a long vascular pedicle and of being easily



Fig. 2

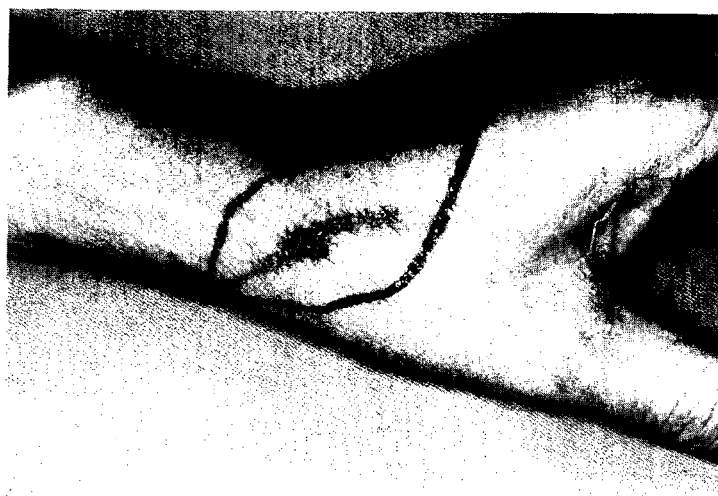


Fig. 3



Fig. 4

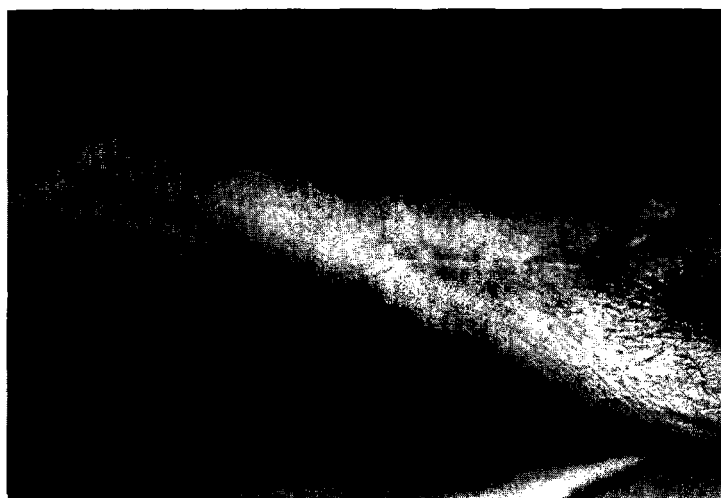


Fig. 5

**Figure 2**—*Case 1*. Basal cell carcinoma on the left ala and cheek. **Figure 3**—A snuff-box flap 3 × 6 cm was harvested from the left hand. **Figure 4**—Good result with regard to colour and texture 6 months after operation. **Figure 5**—The scar at the donor site was unobtrusive.

raised. The donor site can be closed primarily. The flap produces no subsequent sensory or motor disturbance. Although it is most suitable for the dorsal surface of the hand as far as reconstruction is concerned, it is also suitable for reconstruction of the nose because the texture is relatively akin to that of the facial surface. However, there are the disadvantages of the flap being small and the sacrifice of a major blood vessel of the forearm, the radial artery. Thus, the flap should be selected only when there are appropriate indications for its use.

Of our 5 cases, cutaneous perforators from the radial artery were confirmed at surgical exploration in only 2 cases. Since those early cases we have raised the flap without looking for any cutaneous perforator whatsoever and in our experience, a skin flap as small as the snuff-box flap can be adequately fed by only 2 or 3 very thin feeding blood vessels in the flap and when the flap is raised with the radial artery and the soft tissue of the snuff-box, such vessels are included and no complications related to vascular supply will occur.

In all of our cases a vena comitans was more suitable



Fig. 6



Fig. 7



Fig. 8

**Figure 6**—Case 2. The skin defect on the dorsal surface of the left hand with exposure of the extensor tendon of the third finger. **Figure 7**—A 3 × 6 cm snuff-box flap from the opposite hand. **Figure 8**—Six months after surgery.

than the cephalic vein for drainage. In two cases when the flap was used as a free flap there was no venous return for a brief period after the arterial anastomosis, probably because of vascular spasm, but after the venous anastomosis there was favourable venous return. Since the cutaneous perforators are very thin, the blood flow in the flap may be disturbed for some time by spasm. If the flap has been correctly raised, however, it is generally advisable to wait for clinical improvement under these circumstances, as spontaneous recovery is very likely to occur and this situation has no influence on whether or not the flap survives.

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Paper received 12 June 1992.

Accepted 17 September 1992, after revision.