



## 'Jumping' cross finger flaps: a useful technique for salvaging parts in mutilating hand injuries

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**SUMMARY.** In multi-digital injuries, soft tissue from non-adjacent injured fingers, which would have otherwise been discarded, can be used to cover small defects in salvageable digits. This was found useful in the salvage of four digits and one thumb. Anticipation of the need for a flap cover, and the possible availability of tissue in non-adjacent digits, is of paramount importance during the planning process in these injuries. This technique of using 'jumping' cross finger flaps is a useful method, when dealing with multiple finger mutilations that need soft tissue cover. © 2000 The British Association of Plastic Surgeons

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The common source for cover of soft tissue defects in the fingers is either the same finger or the adjacent finger. In multiple digital injuries, these options may not be available.

We have successfully used soft tissues of non-adjacent amputated digits in the form of 'jumping' cross finger flaps to provide skin cover and thus avoided the need for other reconstructive methods and, at the same time, utilised tissue that might have otherwise been discarded.

### Materials and methods

Between 1996 and 1999, five patients had their hands reconstructed after mutilating hand injuries, utilising the 'jumping' cross finger flap (Table 1).

#### Case 1

A 27-year-old patient sustained severe crush injury to the left hand due to the hand getting caught between the rollers of a textile machine (Fig. 1). The patient, as a result, needed amputation of irreversibly damaged little, ring and index fingers. The thumb was crushed and avulsed at the level of the base of the proximal phalanx. Therefore, to reconstruct the thumb, the injured index finger stump was primarily pollicised (Fig. 2). The raw area over the pollicised neo-thumb needed cover as well as a 2 × 1 cm area on the dorsum of the middle finger. The ring finger, which had to be terminalised at the level of the proximal phalanx due to lack of skeleton beyond that level, had enough soft tissues to make two flaps. One covered the dorsum of the middle finger. The other bypassed the middle finger and covered the stump of the newly reconstructed thumb (Fig. 3). Hence the word 'jumping'. The flaps were divided in 2 weeks and final result was excellent (Fig. 4A,B).

#### Case 2

A 20-year-old male patient suffered crush injury of all four fingers, in a textile roller machine. The soft tissues of the index, middle and ring fingers were found split into dorsal and volar flaps with the skeleton completely degloved and shattered beyond the proximal phalanx. The dorsal flaps were non-viable beyond the PIP joint. The little finger had a burst wound at the PIP joint level, with intra-articular fractures of the PIP joint,

**Table 1** Patient details

No.	Type of injury	Type of 'jumping' cross finger flap
1.	Three fingers (index, middle, ring) crushed distal to PIP joint. Index finger length maintained. Others shortened at PIP level	Volar flap from ring finger used to cover defect at middle phalanx volar aspect, index finger
2.	All five digits crushed, with thumb amputated at proximal phalangeal level. Index stump used for primary pollicisation (Case 1)	Raw area over pollicised neo-thumb covered with a volar flap from ring finger. A dorsal flap from ring finger used to cover raw area over the dorsum of the middle finger
3.	Four digits sparing thumb, crushed distal proximal phalangeal level. Little finger length maintained, others terminalised at proximal phalangeal level (Case 2)	Volar flap from middle finger used to cover defect over volar aspect of PIP joint of little finger
4.	Crush injury of middle, ring and little fingers distal to PIP joint. Middle finger had a compound fracture at middle phalangeal level. Ring and little fingers had gross comminution of the entire skeleton beyond PIP joint, and were therefore terminalised at that level	A dorso-ulnar 'jumping' cross finger flap from little finger used to cover defect on volar aspect of middle phalanx of middle finger
5.	Ring finger crushed from mid-phalangeal level. Raw area over radial aspect of index finger. Ring finger terminalised at middle phalangeal level	Flap from ring finger used to cover defect on radial aspect of index finger

which necessitated arthrodesis. There was a defect of 2 × 2 cm on the volar side of the PIP joint.