

PROBLEM OF SENSORY LOSS IN FINGER-TIP INJURIES IN THE BLIND

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FINGER-TIP injuries are comparatively rare in the blind, perhaps because of their highly skilled use of the finger tips and their avoidance of occupations in which finger-tip injuries are frequent. When a blind person loses the sensitive skin from his finger tips he is, as it were, deprived of his eyesight for a second time. The loss of the index finger tip is particularly serious, as it is with this finger on both hands that he reads



FIG. 1

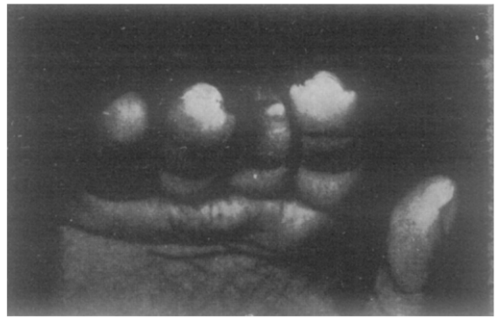


FIG. 2

Fig. 1.—The result six weeks after primary split-skin grafting of the tips. They were insensitive and could not distinguish Braille letters.

Fig. 2.—Following volar advancement flaps of the index and ring fingers, the pulp contour is satisfactory and the patient can again read Braille.

Braille. As no special advice for treating these injuries could be found in the literature, our experience, although based only on one case, is presented.

Case History.—On 18.9.68, the patient, aged 26 years and blind since childhood, lost the distal parts of his right index, middle and ring fingers, at the level of the skin crease of the distal interphalangeal joint of the middle finger, in an accident with a metal-cutting machine in a workshop for the blind. Split thickness skin grafts were applied as primary cover. Within six weeks the grafts had shrunk considerably, drawing the surrounding skin (Fig. 1). The finger tips were insensitive and he could not feel the dots of the Braille alphabet.

On 28.1.69, volar advancement flaps (Moberg, 1964 ; Snow, 1967) were used to resurface the index and ring finger tips after excision of the insensitive skin grafts and scars ; the middle finger, after revision of the bony stump, was closed by skin advancement. Healing was by first intention and the sutures were removed on the tenth day. At this time the patient could feel Braille dots, but no more. At six weeks, two-point discrimination was present but he had to feel the dots several times to be sure of their number. At 12 weeks he could recognise the number of dots and the shape of the letters, but had to feel twice to be sure of the words. At 16 weeks he was able to read although more slowly than before the accident. He appears to have regained almost normal sensation in the index and ring fingers, but the middle finger, although sensitive to the usual stimuli, has not sufficient two-point discrimination to decipher Braille. The pulp contour of index and ring finger is excellent (Fig. 2).

DISCUSSION

The primary skin grafts were applied to gain time for consideration of the best method of definitive repair to be carried out as an elective procedure. The patient was understandably reluctant to have his fingers shortened further. A cross-finger or thenar flap procedure could have been carried out, but it was doubtful whether this would provide the fine sensation required by a blind person. A recent study by Porter (1968) on functional assessment of transplanted skin in volar defects of the digits, has shown it to be a superior method compared to free grafts; the experimental studies of Fitzgerald *et al.* (1967) in pigs, have shown by histological methods that the sensory nerves enter the vacated neurolemmal sheath to re-establish the innervation of transplanted skin. Skin grafts for replacement of pulp skin never have the fine quality of sensibility or stereognosis that is present in the normal (Bunnell, 1964).

For these reasons only local volar flaps could be considered for the solution of our patient's particular problem. Local skin transfers, as advocated by Flint and Harrison (1965) and Hueston (1966) are dependent on a single neurovascular pedicle and the sensation is somewhat less than normal; Sullivan *et al.* (1967) suggest that this difference is analogous to the difference between monocular and binocular vision. A volar advancement flap based on both neurovascular bundles (Moberg, 1964; Snow, 1967) or its modification (Littler, 1964; O'Brien, 1968) appeared to offer a better chance for full recovery of sensation over the tips of the fingers and indeed has been very satisfactory in this particular case, the sensation returning to something approaching normal. The remaining sensitivity deficit may be due to the fact that the skin proximal to the pulp has a smaller number of sensory nerve endings; Zurbecky (1964) reported 23 Meissner corpuscles per square millimetre in finger tips, nine per square millimetre in the middle segment and three per square millimetre in the proximal segment. Furthermore, the dorsal nerves, which may supply some overlapping sensation, are necessarily cut by the mid-lateral incision of the volar advancement operation.

SUMMARY

A case report of a blind person with multiple finger tip injuries is presented. Volar advancement flaps provided adequate tip sensation for reading Braille.

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