



Dorso-palmar triangular finger flap-A new advancement flap for cover of finger amputations-A preliminary report

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Summary

A triangular V-Y type advancement flap on the finger has been designed, which advances skin from over the whole circumference of the finger, which includes both palmar and dorsal skin. The flap is sensate too. It is indicated for finger and thumb amputations proximal to the body of the nail. Six flaps were raised with five successes and one partial necrosis. This is a preliminary report on a new flap.

Key word : Finger amputation, Dorsopalmar flap

Introduction

Finger amputations are best covered by local skin. Preservation of maximum possible and provision of sensation are desirable. Local advancement flaps meet these criteria. V-Y type advancement flaps have the advantage of closure of the secondary defects directly.

Anatomy

The flap contains both palmar and dorsal skin encompassing the whole circumference of the finger distally. The principal neurovascular supply is from the neurovascular bundle on the side at the apex of the triangular flap. There is additional supply from the opposite neurovascular bundle. Intact subcutaneous tissue retains the vessel and nerve branches also.

Methods

Flap design and dimension

In case of horizontal amputations the flap can be

primarily based on either neurovascular bundle. In case of oblique amputation the primary neurovascular bundle is on the longer side of the finger. The apex of the triangular flap is located proximally on the midlateral line of the finger on the side of the primary neurovascular bundle. The base of the triangular flap is the skin at the margin of the amputation over the whole circumference of the finger, which includes both palmar and dorsal skin.

The incision proceeds from the apex obliquely distally on both volar and dorsal skin till they meet on the opposite midlateral line at the level of the amputation, encompassing the whole circumference of the finger. The vertical height of the triangular flap is about one and a half times the horizontal width of the finger at the level of amputation. The movement of this flap is through a combination of expansion of the flap due to release of the flap from the underlying structures and V-Y advancement.

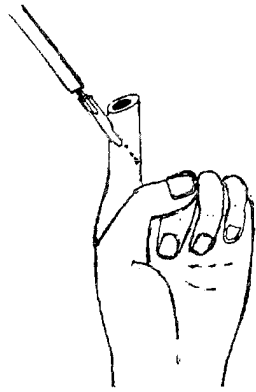


Fig 1a. Incision on palmar aspect of the finger

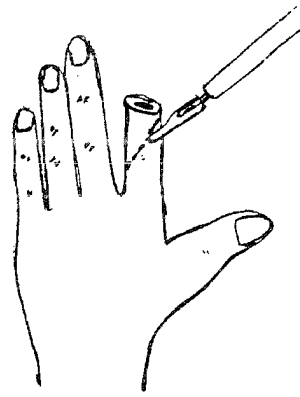


Fig 1b. Incision on dorsal aspect of the finger

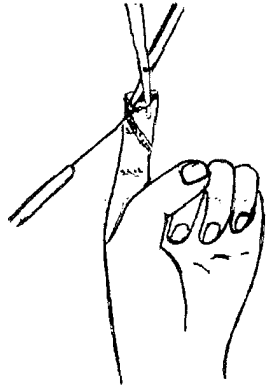


Fig 1c. Division of fibrous bands connecting the fibrous flexor sheath to skin

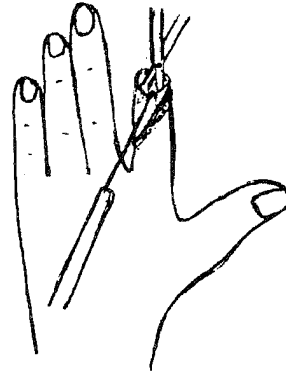


Fig 1d. Division of Clelland's ligament

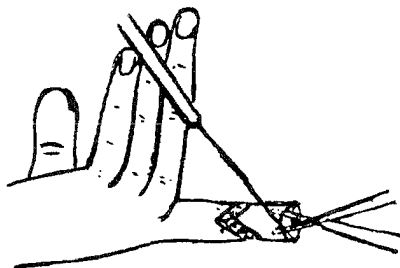


Fig 1e. Freeing the dorsal skin from extensor paratenon

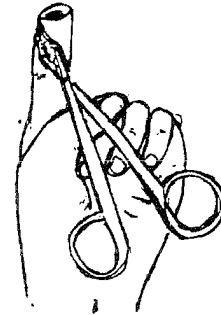


Fig 1f. Releasing the fibrous bands of subcutaneous tissue

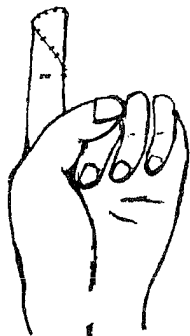


Fig 1 g. The sutured flap - palmar view



Fig 1 h. The sutured flap - dorsal view

Operative technique

The skin is incised through full thickness of dermis on both palmar (Fig 1a) and dorsal surface (Fig 1b). The flap is freed from the underlying tissue from distal to proximal part using the following technique.

The palmar skin is freed by dividing the fibrous bands from the periosteum at the tip and the fibrous flexor sheath proximally by sharp and blunt dissection (Fig 1c)

On the midlateral aspects the Clelland's ligament is divided up to the apex on that side and adjacent to the amputation on the opposite side, by sharp dissection keeping the scissors close to the periosteum (Fig 1d)

On the dorsal aspect, any remnant of the root of the nail is removed and the flap is freed from the periosteum near the tip and the extensor paratenon more proximally, as in cross finger flap, by using both sharp and blunt dissection (Fig 1e)

Mild spreading of subcutaneous tissue across the line of incision is done to release any restricting bands (Fig 1f). Blunt tipped fine scissors are used for dissection and skin hooks and small retractors are used for retracting the skin. All dissection is done under direct vision and good lighting. Use of a magnifying loupe is preferable.

The flap advances distally. The combined advancement of dorsal and palmar skin can easily exceed two centimeters.

The flap is sutured with 4-0 prolene in Y fashion (fig1g). At the base of the triangle the palmar skin is sutured to the dorsal skin. Sutures are removed at the end of 12 days.

Six flaps have been raised (Fig 2-4) on fingers and one on the thumb.

Results

Five flaps healed uneventfully. Two-point discrimination at the end of thirty days was 1mm than normal. One flap underwent partial necrosis. A cross finger flap covered the defect.

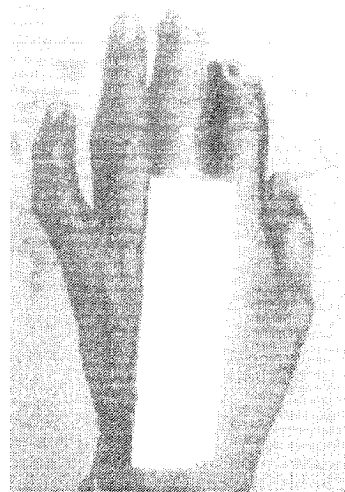


Fig 2. Amputation of left index finger close to proximal inter-phalangeal joint and of middle finger through proximal part of the nail

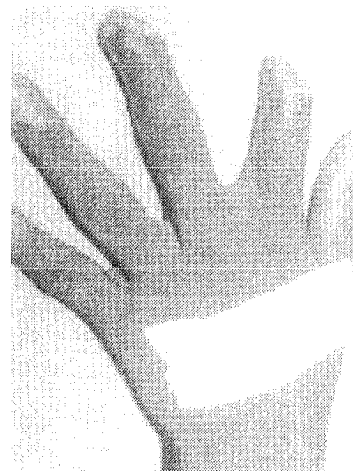


Fig 3. Healed flaps (Dorsopalmar triangular finger flap on index finger and oblique triangular flap on middle finger) - palmar view

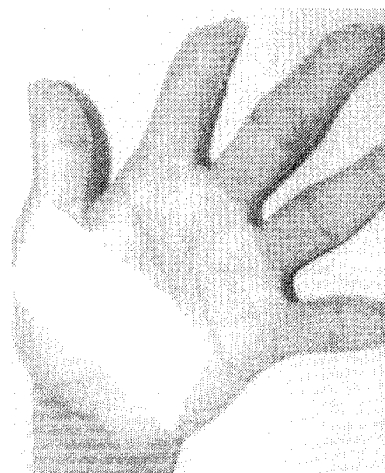


Fig 4. Healed flap (dorsopalmar triangular finger flap on index finger) - Dorsal view.

Discussion

A local advancement flap for coverage of amputation of fingers has the advantage of carrying sensation. Both central¹ and lateral² advancement flaps based on subcutaneous tissue pedicle have been described. Flaps, which specifically include neurovascular bundles on their pedicles have also been used^{3,4}. All the flaps described so far have used advancement of palmar skin only. The present dorso-palmar triangular finger flap advances both palmar and dorsal skin and hence provides more skin than other flaps. The flap retains adequate vascularity and sensation since both neurovascular bundles and the subcutaneous vessels and nerves are kept intact.

The difference of one millimeter in two-point discrimination at the end of the one-month is minimal and may improve over time.

Conclusion

The dorso-palmar triangular finger flap is a sensate flap and is indicated for coverage of finger amputations proximal to the body of the nail. It advances both dorsal and palmar skin from over

the whole circumference of the finger and, hence, provides substantial amount of tissue.

References

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