

Perforator plus hatchet flap for salvage of donor site complication following cross finger flap: A case report

Korambayil Mukundan Pradeoth

ABSTRACT

Cross finger flaps are commonly used flap for the reconstruction of soft tissue defects involving the fingers and thumb. Following reconstruction by cross finger flap, the donor area is usually addressed with split thickness or full thickness skin graft. When considering the benefits of cross finger flap to other reconstructive options, cross finger flap seems to be the most common option in plastic surgeons' armamentarium. Complications in the donor area due to infection or inflammation are uncommon as the hand being a highly vascular structure. We present a case of cross finger flap with graft loss in the donor area as a complication, salvaged by a perforator plus flap incorporated in the hatchet flap. There were not any complications following the salvage procedure. Hyperbaric oxygen therapy was used as an adjunct for a salvage procedure.

Key words: Cross finger flap, donor site complication, perforator plus flaps, hatchet flap, hyperbaric oxygen therapy

Introduction

Cross finger flaps [1] described by Gurdinin and Pangman in 1951, remains to be the workhorse flap owing to its ease of harvest, safety, and reliability in the reconstruction of the fingers and thumb defects. Cross finger flap is the preferred method to abdominal or groin flap because there are less positional difficulties and less bulkiness to the transferred tissue. However, cross finger flaps consist of complication [2]. We present a case of cross finger flap with graft loss in the donor area as an immediate complication, which was

salvaged by a perforator plus flap incorporated in the hatchet flap. There was not any complication following the salvage procedure. Hyperbaric oxygen therapy was employed as an adjunct for salvage procedure [3].

Case Report

A 23-years-old male with an injury to the right little finger due to crush between the woodcutter machine presented in the Emergency Department. There was no evidence of bony injury in X-ray right hand at the site of injury. There was a soft tissue loss volar aspect of the right little finger from the pulp to the shaft of the mid-

Author affiliations : Department of Plastic Surgery and Burns, Jubilee Institute of Surgery for Hand, Aesthetic and Microsurgery, Jubilee Mission Medical College and Research Institute, Thrissur, Kerala, India

Correspondence : Korambayil Mukundan Pradeoth, MD, Department of Plastic Surgery and Burns, Jubilee Institute of Surgery for Hand, Aesthetic and Microsurgery, Jubilee Mission Medical College and Research Institute, Thrissur, Kerala, India. e-mail: pradeoth@gmail.com

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Figure 1. Soft tissue defect right little finger volar aspect.



Figure 2. Donor site graft loss of right ring finger exposing extensor apparatus.



Figure 3. Cross finger flap in the recipient area.

dle phalanx exposing the underlying flexor digitorum profundus tendon (Figure 1). Cross finger flap from the right ring finger to little finger was planned. After flap cover, the donor area was covered with split-thick-



A



B



C

Figure 4. (A) Perforator plus hatchet flap dorsal view (B) Perforator plus hatchet flap lateral view (C) Perforator plus hatchet flap lateral view following inset.

ness skin graft harvested from the right upper arm medial aspect. The patient developed an infection in the donor area on day 14, which was treated conservatively with antibiotics and repeated dressing. Three days later, the patient developed total loss of grafted skin (Figure 2). The cross-finger flap was healthy (Figure 3). After flap division on day 21, an inferiorly based perforator plus flap was utilized to cover the upper part of the defect. Then, a hatchet flap was devised along the perforator plus flap to cover the lower part of soft tissue defect to protect the underlying exposed Zone 2 extensor ap-



Figure 5. Perforator plus hatchet flap lateral view following donor area closure.

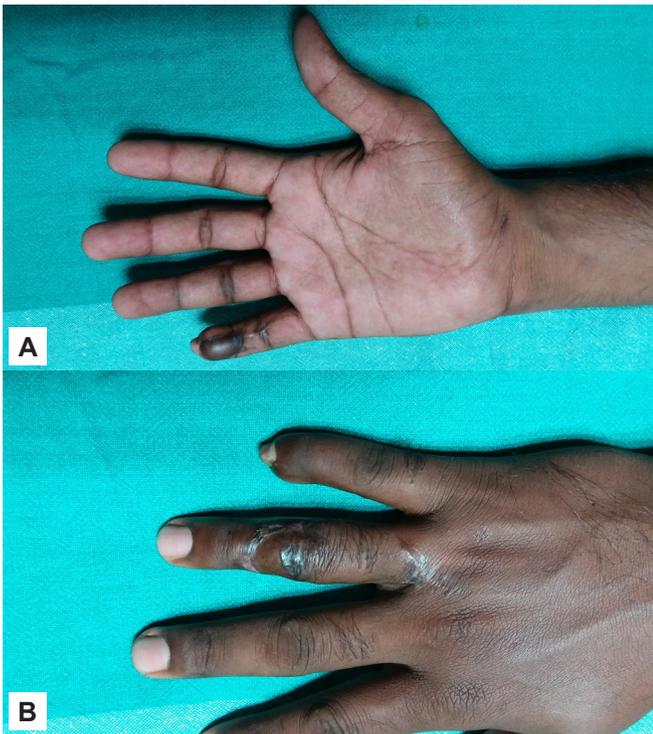


Figure 6. (A) Late postoperative picture of the reconstructed donor area (B) Late postoperative picture of volar aspect little finger – Flap transfer region.

paratus (Figure 4A, 4B, 4C). Donor area of perforator flap covered with a skin graft and donor area of hatchet flap was closed in a V-Y fashion (Figure 5). Six sessions of Hyperbaric oxygen therapy was administered. No further complications had experienced in the postoperative period (Figure 6A, 6B). Donor area healed well.

Discussion

The soft tissue of the fingers needs a stable skin cover. Even though the options of reconstruction vary

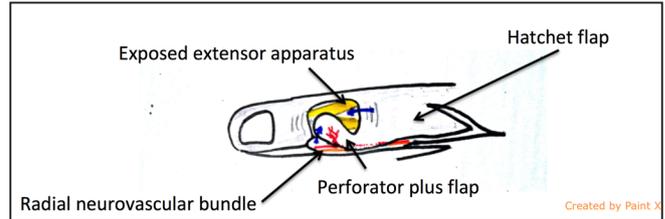


Figure 7. Schematic diagram of perforator plus hatchet flap.

from full thickness skin graft to microvascular free tissue transfer, cross finger flap sharing the same features of the lost tissue, appears to be more reliable and safer. The technical ease of harvesting cross finger flap, the comfort of anesthesia, the similarity of the tissue makes cross finger flap, a workhorse flap for finger and thumb defects [1].

Expected donor site morbidity in cross finger flaps are graft loss, compromise in range of motion, grip strength reduction, instability of scar and cosmetic disfigurement [4]. Graft loss may result in the exposure of the extensor apparatus. Adequate soft tissue reconstruction will be needed to cover the extensor apparatus. If failed in proper reconstruction, it may result in functional deficiencies. In an already operated field, the adjacent tissue will not be pliable enough for mobilization owing to inflammation or fibrosis. We encountered a similar situation where the donor area graft was lost due to infection. The upper part of the defect was covered with a perforator flap based on the radial neurovascular bundle, and the lower part was covered by mobilization of hatchet flap in a V-Y fashion [Figure 7].

Other options for reconstruction of soft tissue defects in the donor area of cross finger flaps are skin grafting, deepithelialized turn over flap, groin or abdominal flap [5]. Once primary grafting is failed in the donor site of a cross-finger flap, regrafting may not be a possible option if the extensor tendon is exposed. Deepithelialized turn over flap will restrict the movement of the involved finger and donor finger for three weeks and invites a possibility of donor morbidity to one another finger. Our utilization of an inferiorly based perforator plus flap with hatchet flap for covering the upper as well

as lower part of the donor area defect helped in successful salvage of donor area complications.

Six sessions of hyperbaric oxygen therapy were administered to provide adequate oxygenation to the inflamed area. Hyperbaric oxygen therapy reduces tissue edema and swelling which provides an additional safety measure in transferring flaps in compromised regions [3].

Conclusion

Perforator plus hatchet flap is a valuable option for salvage of donor site complication following Cross finger flap.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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