

Reverse Homo Digital Artery Island Flap for Finger Tips

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I. Introduction

Often terminal finger tip loss cause reconstructive surgeon in dilemma, in choosing the options to provide aesthetically near normal sensate finger tip. The local flaps are neither in adequate to cover the defect nor do distant flaps- often over burden the tip with excess tissue. Reverse homo digital artery island flap is providing 'just enough' tissue to cover the defects and better solution to this problem by overcoming the disadvantages with pleasing results.

In this article we have shared our experience in three cases that were operated between 2017 to 2020, GGH, Department of Plastic Surgery, Vijayawada.

Case 1:

An young 26 years right hand dominant man had a traumatic accident to left hand following amputation of left index finger tip, resulting exposure of terminal distal phalanx (Fassler Type C). For this defect considering and discussing with available options and limitations, the patient opted for reverse homo digital artery island flap as his first choice. Hence, Reverse homo digital artery island flap was planned on the ulnar side of the finger over proximal phalanx. A flap of 1.5 X1.5 cm, incised ligating the digital artery proximally, continuing the incision circumferentially, extending the incision in a lazy 'S' pattern over middle phalanx till 1 Cm short of to the defect. Due care was taken to avoid injury to digital nerve, and leaving some amount of sub cutaneous fat around the pedicle. Pedicle lifted up to that much adequate enough to reach the defect without any tension. Flap brought to the defect and sutured. Donor site was reduced and left to heal by secondary intention to avoid extra scar of skin grafting. Both the flap and donor site healed well with satisfactory results.

Fig 1: Schematic picture showing finger tip defect, flap harvestation, flap inseting, post op results





Case 2:

A thirty three years male patient with right hand dominance, met with a crush injury of right index finger tip at work site, with loss of tip and pulp exposing the terminal bone (Fassler type B). For this defect after having discussion with the patient, reverse homo digital artery island flap planned and executed. Flap of size 2cm X 1,5 Cm was harvested from the ulnar side of proximal phalanx., which was then transposed and sutured. Donor site was reduced and allowed to heal by secondary intention, with satisfactory outcome.



Fig 2: schematic picture showing finger tip loss, flap cover, immediate results

Case 3: A right hand dominant male boy of 12 years presented with crush injury to right ring finger when he was playing, with loss of finger tip and pulp exposing the terminal phalanx (Fassler Type B). Reverse homo digital artery island flap from the radial side of the finger was planned, of size 1.5 Cm X 2.0 Cm, harvested, transposed and sutured to the defect. Donor site was left to heal by secondary intention without skin grafting.

Fig 3: schematic picture showing finger tip loss, flap harvestation, final inseting



II. Discussion

The commonly available options for the terminal finger tip defects following amputations with loss of pulp and tip with or without nail bed are mostly with local advancement flaps like V-Y, either from volar or lateral advancement depending on the defect. This advancement is suitable for smaller defects involving pulp Fessler type A and for Type B with difficulty, as distance of advancement is limited by anatomical constraints. For larger defects, either V-Y island flaps based on digital artery of the same finger, cross finger flaps or flaps from palm are generally considered. However, these flaps involves two stage procedure and patient compliance is also poor when compare with the digital flaps from the same finger.

Reverse homo digital artery island flap is a reliable option for these terminal amputated fingers of Fessler type B, C, D. Flap is harvested from the skin over proximal phalanx, on antero lateral side (ulnar or radial), keeping the digital artery as center line. The skin on the proximal phalanx is lax enough to provide adequate dimensions of the flap to harvest for the finger tip defects. Identification of neuro vascular bundle is relatively easy due to its size proximally. Hence proximal incision was made to identify the vascular pedicle and also to take care of the digital nerve. The distal limit of harvesting the pedicle is planned in such way that, after 180 rotation, it should reach the defect comfortably without any tension. However pre caution should be taken to leave at least a margin of 1 cm from the defect to the pivot point of the pedicle, to allow reverse circulation to the flap, as this flap being a 'retrograde flap'. Donor defects are allowed to heal by secondary intention as the defects are small with loose tissue in and around.

Over all the aesthetics of the finger tip with the reverse homo digital artery island flap are good, with similar skin, color, texture, sensation with no hair and also with minimal or no donor site morbidity, meeting all the criteria of 'principles of restoration'.

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