

Fingertip and Thumb Tip Wounds: Changing Algorithms for Sensation, Aesthetics, and Function

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Editors

David T. Netscher, MD, has no relevant conflicts of interest to disclose.

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All authors of this journal-based CME activity have no relevant conflicts of interest to disclose. In the printed or PDF version of this article, author affiliations can be found at the bottom of the first page.

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David T. Netscher, MD, has no relevant conflicts of interest to disclose. The editorial and education staff involved with this journal-based CME activity has no relevant conflicts of interest to disclose.

Learning Objectives

Upon completion of this CME activity, the learner should achieve an understanding of:

- The indications and rationale for semioclusive dressings
- Restoration of contour and sensation to the thumb and fingertip
- Indications for a variety of intrinsic digital flaps to cover digital tip injuries

Deadline: Each examination purchased in 2017 must be completed by January 31, 2018, to be eligible for CME. A certificate will be issued upon completion of the activity. Estimated time to complete each JHS CME activity is up to one hour.

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Received for publication January 25, 2017; accepted in revised form January 26, 2017.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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0363-5023/17/4204-0008\$36.00/0
<http://dx.doi.org/10.1016/j.jhssa.2017.01.022>

Management of fingertip and thumb tip injuries has recently undergone substantial changes. The time-proven traditional armamentarium of local flaps has been expanded and replaced by a wide variety of flaps. Simultaneous with the development of new flaps, the conservative treatment of fingertip and thumb tip injuries with semioclusive dressings has also become a more acceptable treatment for these injuries. The excellent results with respect to restoring contour, sensibility of the pulp, and aesthetics of the finger justify this more tedious and time-consuming treatment of fingertip and thumb tip injuries. This article gives an update of the most commonly used flaps and the semioclusive dressing treatments of fingertip and thumb tip injuries. (*J Hand Surg Am.* 2017;42(4):274–285. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Finger, tip injuries, treatment concepts.



THE HAND IS THE MAIN AUTOLOGOUS “TOOL” used by primates and humans, so it is no surprise that fingertip and thumb tip injuries are the most frequently encountered injuries of the upper limb. The fingertips and thumb tips are the most important organs of tactile sensibility. The high density of Vater-Pacini bodies and the branches of the palmar digital nerves usually provide a dynamic 2-point discrimination between 3 and 4 mm. The terminal branches of the main palmar digital arteries provide the fingertip and thumb tip with arterial blood. Venous drainage on the palmar side is provided by superficial palmar veins and oblique communicating veins. The architecture of the subcutaneous tissue and fascia of the pulp withstands substantial pressure and shear force.

In the literature, no clear definition of fingertip and thumb tip defects can be found, mostly the defects are defined as small or large.¹ There are also classifications that describe the involved structures as the nail, pulp, or bone.^{2,3} Using both criteria, defect size and involved structures, is the best basis for selecting the suitable reconstructive procedure. Many factors—such as the nature of the injury, the location, the size and condition of the defect, sex, patient age and general health, and last but not least, the patient’s avocational and professional activities—are considered for the selection of the most suitable technique. The goals of fingertip amputation reconstruction are to cover the defect with a satisfactory cosmetic appearance, establish maximum tactile gnosis, preserve the length of the finger and thumb, obtain a well-padded pulp, preserve an intact nailbed, and minimize time off work.⁴ Sometimes, these goals are mutually exclusive and then one has to choose the best option for the patient. There are a wide variety of published methods for reconstructing fingertips, mostly based on the

principles of the reconstructive ladder, namely, healing by secondary intention, skin grafting, palmar V-Y-plasty,^{5–7} island flaps, and even free flaps such as the free toe pulp flap for larger defects. An easy method is skin grafting of the defect, but this usually results in poor sensory function so it should be considered only if other options are not practicable. A good method for small to medium defects, even with small exposure of tendons or bone, is healing by secondary intention under a semioclusive dressing. If successful, excellent pulp contour with satisfactory return of sensory function is achieved. The most commonly used flaps for fingertip and thumb tip reconstruction can be divided into advancement flaps,^{8–13} distant island flaps (homodigital),^{14–25} and heterodigital,²⁶ metacarpal perforator,²⁷ and microsurgical free^{28–35} flaps. The challenge for the reconstructive surgeon is to choose, from these numerous options, the method that best meets the patient’s needs.^a

FINGERTIP AND THUMB TIP RECONSTRUCTION

The fingertip or thumb tip for our purposes is defined as distal to the insertion of the flexor digitorum superficialis tendon in the finger or the interphalangeal joint of the thumb. Finger and thumb defects with exposure of tendons, bone, or joints present a challenging reconstructive problem. The highest priority to preserve function, sensibility, and aesthetics is the immediate coverage of the wound. For reconstruction, a variety of flaps and the semioclusive dressing technique are commonly used.

V-Y ADVANCEMENT FLAPS

Palmar V-Y-plasty (Tranquilli-Leali or Atasoy flap)

The palmar V-Y advancement flap was first described in 1935 by Tranquilli-Leali⁹ and redefined in 1970 by

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