

# Aesthetic and sensory reconstruction of the thumb. A case report.

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## Background

Hand surgery has undergone substantial changes in recent years, especially for reconstructive surgery techniques. Posttraumatic thumb defects result in significant functional impairment. The thumb is the most important digit in hand function, daily activities such as holding, gripping, opposition, circumduction, and motions involving the manipulation of the hand are possible because of the unique anatomical properties of the thumb. Thus, damage to the thumb results in greater loss of function compared to the other fingers. Multiple reconstructive procedures have been described for the management and improvement of function. Compared with no treatment, all reconstructive methods are beneficial. Neurovascular island advancement flaps can be utilized in relatively larger defects. Littler flap has been widely used to repair large pulp defects of the thumb because this method restores sensory function.

**Keywords:** Thumb Reconstruction, Thumb Pulp defects, Hand Trauma, Littler's flap.

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Case Report

Plastic Surgery



The thumb is the “master digit” of the hand and is involved in 40% of hand function. The thumb is special due to its ability of opposition, which enables in carrying out most routine daily activities. Fingertip amputations that result in a wound up to 1 cm can be managed conservatively. Non-surgical management of such wounds using semi-occlusive dressing represents an effective management strategy in terms of providing satisfactory functional and aesthetic results, good pulp thickness, adequate nail growth and restoration of sensation as well. The goals for reconstruction are a pain-free thumb simply because a painful one will not be used. Similarly, length is critical a short thumb will be relatively unable to grab large objects or pinch and pick up smaller ones. The Littler flap is a sensate, vascularized flap that is harvested from the ulnar aspect of the middle finger or the radial aspect of the ring finger. This flap can provide similar texture and sensory coverage for large defects. However, donor-site morbidity issues such as sensory loss, cold intolerance, painful neuroma formation and scar contracture are well known.

## Case report

We present the case of a 40 -years-old male patient to our plastic and reconstructive surgery department after a hand trauma with loss of right distal thumb fingertip, at the moment of our examination, active bleeding was present, loss of distal tissue and bone of the right hand. well distal perfusion by ulnar and radial artery confirm by a Allen test, Radial, Ulnar and Median nerves were all preserve, all ranges motions of all fingers as flexion and extension, were all normal. Left hand examination without abnormalities. Due to the gravity of the injury we did a surgical debridement, and a primary repair with a littler flap coverage.

## Littler's flap

Litter's neurovascular islanded flap is a heterodigital, single-stage, sensate flap, The flap is harvested from the ulnar aspect of the middle finger or radial aspect of the ring finger. The flap is marked, keeping the midlateral line as the axis of the flap.

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**Figure 1.** Absence of distal part of right thumb.

A zigzag incision is made over the lateral aspect of the finger proximal to the flap to expose the neurovascular pedicle, the flap is elevated from distal to proximal, When the dissection is reached at the bifurcation of the common digital vessels and nerve, the artery to the adjacent finger is ligated and divided, The common digital nerve to the adjacent digit is dissected using intraneural dissection and then separated., during the elevation of the flap, care should



**Figure 2.** Litter's flap dissection



**Figure 3.** Reach of the distal thumb with Litter's flap.

be taken to preserve the sheath of the flexors and the peritendineum of the extensor; Once the flap is freed and all dissection is completed, the flap is transferred to the defect and inset is done; the donor site is covered with a full-thickness skin graft. Flexion contracture of the middle finger is a common complication that occurs more frequently when a large flap has been raised, when the skin graft has not taken well.

### Discussion

The thumb plays a very important role in hand



**Figure 4.** 24 weeks post-surgery. Palmar view.

function. It is important to take any kind of measure to restore the mobility, stability, length and sensory properties of the thumb after hand trauma. The reconstruction of the posttraumatic thumb defect depends on many patient and injury variables. Patient variables include age, occupation, hand dominance, comorbidities and associated injuries. The design of different flaps for the hand has been the result of an improvement in the knowledge of hand neurovascular anatomy as well as their hemodynamic behavior. The first neurovascular pedicled island flap was described by Littler the design of the flap is subject to the location of the lesion. Advisable donor sites are the ulnar aspect of the index and middle fingers as well as the radial aspect of the ring and little fingers. The Littler heterodigital neurovascular flap and the Foucher first dorsal metacarpal artery flap are methods used to achieve length and sensory properties. The primary complications of heterodigital neurovascular island flaps have been identified as cold intolerance, low somatosensory cortical integration, and weakened sense of discrimination.

### Conclusion

Extensive loss of the thumb pulp with or without bone exposure is a major problem for the patient and remains a challenge for hand surgery, surgical possibilities include regional, distant, and local flaps. Despite the fact that the Littler neurovascular island is fraught with many problems, it is suitable for large finger defects where return of sensation is critical, such as injuries to the thumb's pulp. Most of the neurovascular island flap's problems can be attributed to the digital nerve. Coverage by this thin flap produces an excellent cosmetic result and enables early mobilization of the hand., many articles have reported progressive deterioration of sensibility, "double-sensibility," cold intolerance, hyperesthesia, and other problems, especially with the conventional island flap.

Littler's flap, if properly done has proved to be an extremely valuable tool for the reconstruction of thumb pulp defects.

### Conflicts of interests

The authors would like to declare that there is no conflict of interest

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