

Nail bed trauma reconstruction and artificial nail replacement – a case report

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Summary

Nail bed reconstruction is crucial after fingertip trauma, impacting both function and aesthetics. In this article, the authors describe a case of partial distal phalanx amputation of the index finger with laceration of the nail bed's remaining part. A traumatically elevated skin-fat flap covered the exposed bone on the fingertip, preserving finger length and sensitivity on the radial side. A full-thickness skin graft from the forearm closed a secondary defect on the finger pulp. Nail bed suturing prevented scarring and nail deformity, and a temporary artificial plastic nail replacement maintained the nail bed's shape. Temporary artificial nail replacements protect the regenerating fingertip bed, promote healing, and prevent nail deformities. Proper adaptation of lacerated nail bed edges, supported by either the patient's own nail or a temporary artificial nail, is crucial for optimal fingertip restoration, including proper nail shape.

Key words

amputation – fingers – nails – hand injuries – trauma – skin transplantation – surgery

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Introduction

The significance of nail bed reconstruction after trauma cannot be understated, as it directly influences both the functional and aesthetic outcomes of digit injuries. Traumatic injuries to the nail bed can lead to deformities, discomfort, and compromised nail growth [1]. Proper reconstruction is essential for preserving fingertip function, maintaining sensation, and preventing complications.

Description of the case

Our patient sustained a traumatic injury resulting in the partial amputation of the distal phalanx of the right index finger. The accident also caused partial detachment of the ulnar side finger pulp in terms of a skin-fat flap. To address this complex issue, we performed a surgical procedure in two steps.

The surgery was performed using a digital block with the application of

a tourniquet on the finger to achieve a bloodless field, and with magnification at 3.5× using loupes.

In the first step, the previously described skin-fat flap was utilized as a random flap and transposed to cover the exposed bone of the distal phalanx. This successfully preserved the finger's maximal length and sensitivity on the radial side.

Then, we performed closure of the secondary defect resulting from the flap's transposition. A small full-thickness skin graft from the volar aspect of the forearm was utilized.

In the second step of the operation, the torn nail bed was meticulously sutured with absorbable material 6-0, providing stability, and promoting proper healing. Plastic material removed from the suture packet was fashioned into an artificial nail replacement and firmly fixed in place using absorbable 4-0 su-

ture. This approach ensures not only a smooth and properly shaped nail bed prepared for the re-created nail, but also maintains the germinal and sterile nail matrix in the correct position (Fig. 1) [2].

Discussion

In cases where the native nail is lost or irreparably damaged, the use of temporary artificial nail replacements presents a viable solution. These replacements offer several advantages, including maintaining the contour of the fingertip, protecting the delicate regenerating nail bed, and spacing for normal nail growth. The artificial nail acts as a barrier, safeguarding the underlying tissue from external trauma and facilitating its undisturbed healing process [3]. It also prevents scarring beneath the eponychium, thus preventing nail deformities.

Despite using artificial material to cover the treated nail bed in our case,



Fig. 1. Transposed flap covering the bone and artificial nail replacement in its final position.

it is generally recommended to utilize the patient's own nail [4], if available, for covering the bed. However, in our case, the patient did not have a suitable amputated nail to use for coverage, which led us to employ the method described above.

Although simple suturing of a lacerated nail bed remains a widely used method in our department, there are instances where tissue adhesive 2-octylcyanoacrylate (Dermabond) can be employed for precise adaptation of lacerated edges (Fig. 2). This technique was described by Strauss et al. in 2008 [5].

Roles of the authors

Vlastimil Woznica – author, article compositor and surgeon;
Inka Třešková – co-author, article supplementation and consultation;



Fig. 2. The patient was fully satisfied with the outcome of the surgery from both functional and aesthetic perspectives.

Martin Soukup – co-author, article consultation and surgical assistance.

Conclusion: In conclusion, proper reconstruction of traumatized nail beds and the application of artificial nail replacements offer valuable solutions for optimal healing and restoration of function and appearance of the injured finger.

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