FINGERTIP REPLANTATION WITH AN AFFERENT ARTERIOVENOUS ANASTOMOSIS: A CASE REPORT

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Abstract

Dorsal oblique amputations of the fingertip are very difficult injuries to reconstruct. A case of a 16 year old male on whom afferent arteriovenous anastomosis was successfully carried out in the replantation of dorsal part of little finger is presented. Follow-up showed that the result was excellent both functionally and cosmetically.

The fingertip provides handling small objects, fixes the nail complex and also makes up a very important component of cosmesis. The volume of the nail complex (including nail plate, nail bed and dorsal skin) and the distal phalanx account for about 43% of the total volume of the fingertip[1]. Dorsal oblique amputations of the fingertip are injuries very difficult to reconstruct; replantation provides the best possible appearance and function[2,3,4]. When arterial reconstruction is not possible in cases of distal amputation, the use of afferent arteriovenous anastomosis for replantation has been described by several authors and successful results have been reported[4,5]. In such cases, many procedures to prevent venous congestion have been suggested such as external bleeding, the medicinal leech etc.[6,7,8].

We present a case report of successful replantation of dorsal oblique amputation of the fingertip using an afferent AV anastomosis, where no venous drainage method was used.

Case Report

A 16 year old young girl, right handed, confection worker injured her right hand while using a cloth cutting knife. There was complete, dorsal oblique amputation of the distal phalanx of the little finger. This sharp and clean extended injury was started from the distal interphalangeal joint to the distal part of the pulp on coronal plane. The amputated part contained dorsal skin on the the distal phalanx and the distal interphalangeal joint, the terminal extensor tendon, the entire nail complex and a small part of the pulp. To maintain her career plans and social life, the patient replantation of requested her little finger.

The time from injury to the operating room was 3 hours. First, the amputated part was cleaned, debrided and explored under microscope. After meticulous dissection, only a single vein was found in dorsal subcutaneous tissue. Under supraclavicular block anesthesia and pneumatic tourniquet, the little finger stump was dissected and the distal palmar arch of the digital arteries and nerves were found to be intact.

We decided that replantation could be performed the using amputated part as an venous flap. The distal interphalangeal joint was fused about 30° in flexion and fixed by one longitudinal K-wire. The ulnar digital artery was separated from the distal palmar arch dissected proximally to the distal interphalangeal joint, and transposed to dorsal region. Anastomosis between the proximal artery and the distal vein was performed with 11–0 interrupted nylon sutures. After perfusion, blue-pink appearance of the replanted part was observed. Neither venous anastomosis nor fish-mouth drainage was employed.

The patient had an uneventful postoperative course and was given Dextrane (500cc/day), Heparin (5000 IU twice daily, subcutaneously) and 300 mg. acetylsalicylic acid for 1 week. The blue-pink appearance of the replanted part changed gradually after 4 days and improved completely after 6 days. The patient was discharged from hospital 8 days after surgery. K-wire was removed after 5 weeks.

At her last follow-up visit 12 months after replantation, the patient had stable fusion of distal interphalangeal joint and normal nail appearance.

Discussion

In replantation surgery, both arterial and venous reconstruction are necessary for optimal results. However, the type of injury does not always allow using the conventional vascular network. Cases with tissues having survived through arterialized venous microvascular system have been reported by several authors, both clinically and experimentally[9,10].

Koshima reported cases of distal digital replantation using afferent AV anastomosis between the proximal digital artery and the distal palmar vein[4]. Theile also reported a case of thumb replantation, using the same technique between the proximal radial the dorsal artery and dorsal vein[5]. These case reports have emphasized that venous drainage is important[4,6,8]. However, some replanted digits without venous reconstruction have been reported in literature. In these cases, bone marrow that plays a critical role in venous drainage has been described[7,8].

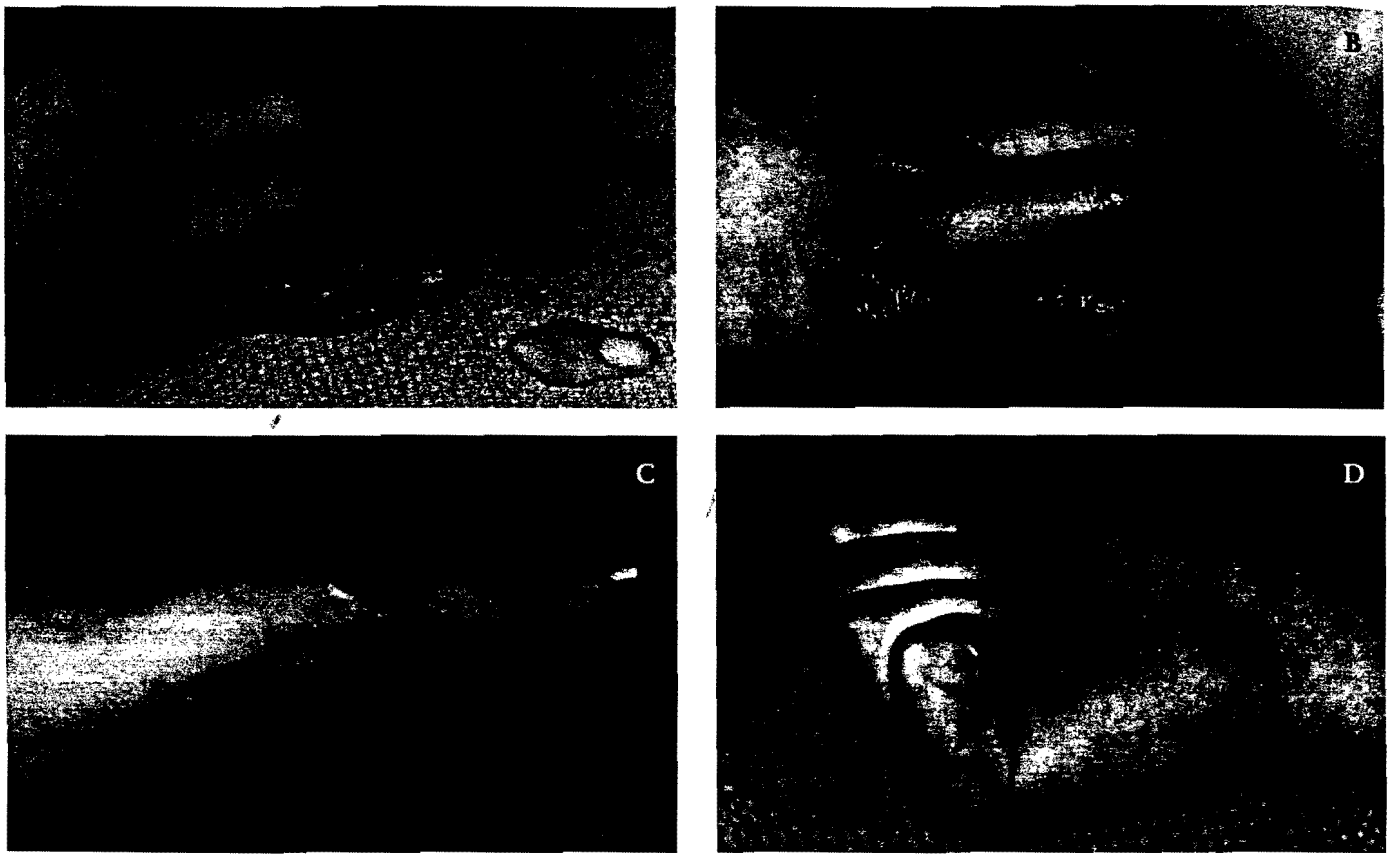

Fig. 1.
A – Preoperative view of amputated little finger; **B** – Early postoperative view of replanted part of the little finger; C, D- Final result at one year.

The presented case is an example of a successful replantation using only one afferent AV anastomosis between the proximal digital artery and the dorsal cutaneous vein without venous reconstruction. In this case, venous congestion was not observed; probably, venous drainage could occur through the bone marrow, and systemic anticoagulation by heparin helped drainage. The color of the replanted part improved after six days.

Alternatives to replantation include many procedures ranging from shortening with closure to reconstructive techniques[2,3]; none of these, however, produces functional and cosmetic results as good as successful replantation. Thus, every attempt should be made to salvage an amputated digit, in appropriate cases.

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