TECHNICAL NOTE

PREVENTING NEUROMA FORMATION IN FINGER AMPUTATION

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When an amputation stump is covered with a bipedicular pulpar island flap neuroma formation can be prevented.

Keywords : finger ; amputation ; island flap ; neuroma.
Mots-clés : doigt ; amputation ; lambeau en îlot ; névrôme.

INTRODUCTION

Neuroma formation and insufficient soft tissue coverage of an amputation stump of a finger are important causes of pain and nonuse. Treatment is difficult and disappointing. Prevention of both problems is possible with the technique presented.

TECHNIQUE

The indication for amputation of a finger can be varied, but a good sensible and well vascularized pulp is necessary. Scarring on the palmar aspect of the finger should be minimal.

The operation can be performed under regional or general anesthesia. Instead of the classical fish mouth incision, the finger is approached through a palmar Brunner incision, starting at palmar crease up to the distal interphalangeal flexion crease (fig. 1a). Both neurovascular bundles are isolated and dissected free (fig. 1b). Usually the branches toward the dorsal aspect can be preserved. The perivascular connective tissue with the veins must be preserved. The skin incision is extended distally around the pulp and the pulp is detached from the distal phalanx and isolated on both neurovascular bundles. At this moment the pulp is completely free (fig. 1c).

In the next step the amputation is performed at the desired level (fig. 1d). The stump is covered with the bipedicular neurovascular pulp flap and sutured in place (fig. 1e). Attention has to be paid to the position of both vessels, and kinking should be avoided. Immediate mobilization is allowed postoperatively.

PERSONAL EXPERIENCE

We have performed this technique on 4 fingers in 4 young male patients (one middle, 3 ring fingers). All fingers had a stiff PIP joint owing to complex dorsal trauma. The procedure was uneventful in three cases ; in the last one, the only remaining vessel was transected during dissection, and it was repaired immediately.

All flaps survived and sensibility in the stump was identical to the pulp sensibility preoperatively. Texture remained good and although the stump was somewhat bulky in the immediate postoperative period, the final aspect was satisfactory for the patient and the surgeon.

DISCUSSION

Amputation of a long finger may be indicated when this finger is functionally disturbing because of its size (macrodactyly), its position (malposition, severe unremediable clinodactyly), or severe instability, stiffness or pain in the PIP and DIP joints.

Although ray amputations undoubtedly give the most pleasing cosmetic aspect, some patients prefer to preserve the full width of the hand.

Amputation of the finger is usually done with a fish mouth incision and section of all structures, including the nerves. The controversy of how to

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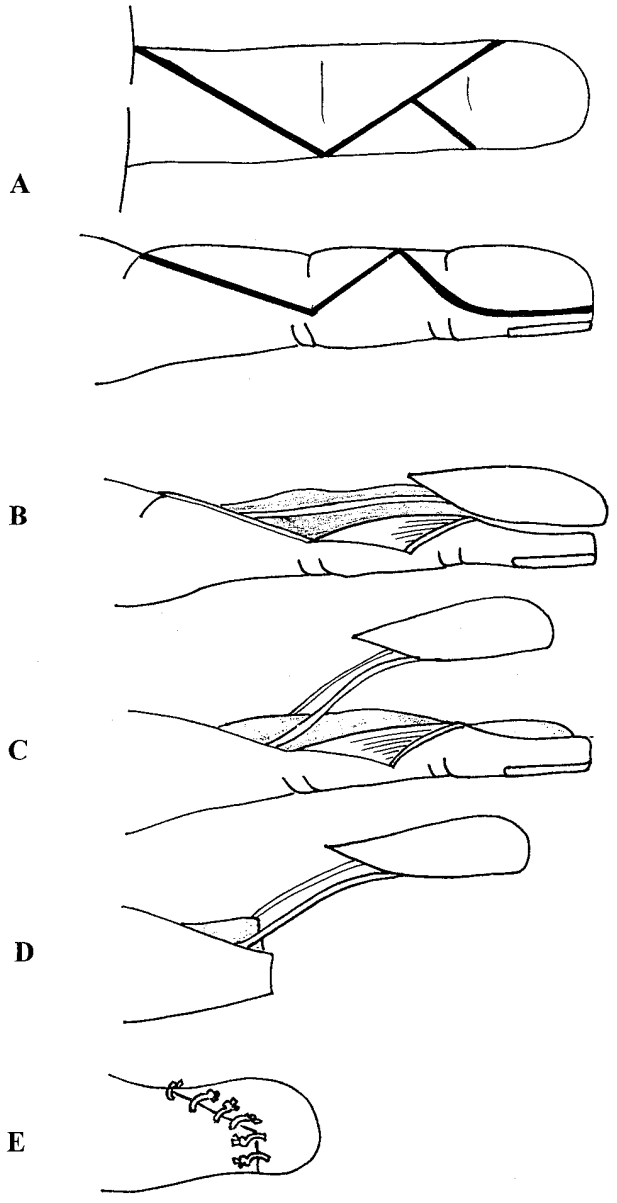

Fig. 1. — Technique of finger amputation.
A : Bruner incision with modification on the pulpar side.
B : Dissection of both neurovascular bundles and preparation of the pulp as a bipedicular island flap.
C : Isolation of the pulpa.
D : Amputation of the finger at the appropriate level.
E : Coverage of the finger with the bipedicular pulpar island flap.

deal with the new stump (clear section, crushing, coagulation, ligation) is not yet resolved. Neuroma formation is frequent and difficult to treat.

This technique advocated by Srivastava and Kahl in 1980 (2) (1 case) and described as a "back shifting" flap by Schuind *et al.* in 1985 (one case with an excellent result) (1) has proven its value in preserving a good sensibility and a good coverage of the amputation stump and in preventing neuroma formation.

LITERATURE

1. Schuind F., Van Genechten F., Denuit P., Merle M., Foucher G. Homodigital neurovascular island flaps in hand surgery. Ann. Chir. Main, 1985, 4, 306-315.
2. Srivastava R., Kahl J. Shifting neurovascular island flap for the reconstruction of amputated finger stump. Plast. Reconstr. Surg., 1980, 66, 301-302.

SAMENVATTING

L. DE SMET. Preventie van neurinoomvorming bij vingeramputaties.

Wanneer de stomp van een geamputeerde vinger kan worden bedekt met een eiland flap van de pulpa, voorkomt men de vorming van een neurinoom.

RÉSUMÉ

L. DE SMET. Prévention des névromes dans l'amputation du doigt.

Il est possible de prévenir la formation d'un névrome après amputation digitale en réalisant une couverture par un lambeau pulpaire bipédiculé.