RECONSTRUCTION OF FINGER TIP AMPUTATIONS WITH ADVANCEMENT FLAP AND FREE NAIL BED GRAFT

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Fifteen finger tip amputations through the proximal half of the nail bed were reconstructed with palmar V–Y advancement flaps and full thickness nail bed grafts. The undersurface of the V–Y flap was sutured to the nail bed remnant and the raw area was covered with full thickness nail bed grafts from the amputated part. They were followed for a minimum period of one year and the nail bed grafts took fully in all patients. The results were best in the thumb and least favourable in the little finger but all the patients were happy with the cosmetic result and the functional outcome. This technique results in an average gain of 5 mm of extra length to the nail. This is a useful technique when replantation of a distal fingertip amputation is not possible.

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INTRODUCTION

The nail is an important functional part of the fingertip. In most cultures and in most individuals, the presence of a nail at the tip of the finger is also highly valued by both sexes for cosmesis. For these reasons, fingertip amputations through the proximal half of the nail-bed are challenging as the remaining nail-bed has inadequate length for satisfactory nail growth.

Replantation at this level gives a good functional and cosmetic results but is technically demanding, requires microsurgical skills and adequate facilities and is not always possible. When replantation is not possible, use of a local advancement palmar flap preserves digital length and the remaining nail bed. However, when the amputation is through the proximal third of the nail, this technique leaves very little nail bed and nail deformities are common. To avoid these, complete ablation of the nail bed and germinal matrix with closure by a palmar advancement flap, or by shortening, are usually carried out. Unfortunately, these treatments often fail to satisfy the patient's desire to retain his or her nail.

When replantation is not feasible, the technique of advancing a palmar V–Y flap and applying the nail bed retrieved from the amputated part to the dorsum of the flap provides an alternative means of restoring nail bed length. This study reviews the results of the use of this technique in 15 patients.

PATIENTS AND METHODS

From February 1998 to June 1999, a total of 15 fingertip amputations were treated by palmar V–Y advancement flaps and full thickness nail bed grafts from the amputated part. There were eight men and seven women. Door crush injuries and industrial accidents accounted for all these injuries. All patients brought the amputated finger tip to hospital. The amputations were classified into three groups according to the level of injury (Fig 1). Group I – Amputations passing through the proximal half of the nail bed; Group II – Amputations passing through the proximal third of the nail bed; Group III – Amputations through the nail fold. Table 1 shows the levels of amputation and the fingers involved.

SURGICAL TECHNIQUE

The finger tip amputation was debrided and, depending upon its obliquity, the exposed bone was covered with, either a straight palmar V–Y advancement flap (Atasoy et al., 1990; Elliot et al., 1995), or an oblique triangular flap (Venkataswami and Subramanian, 1980). The subcutaneous undersurface of the advancement flap was sutured to the remaining nail bed with 6–0 catgut, thereby covering the exposed terminal phalanx. The lateral skin margins of the advancement flap were then sutured to the skin edges of the amputation stump, so that there was no tension over the anchored flap. The pattern of the defect was taken and an appropriately sized full thickness nail bed graft was harvested from the amputated part and sutured to the advanced edge of the flap (Fig 2). The finger was immobilized for 2 weeks in a below-elbow splint and the patients were reviewed at regular intervals.

RESULTS

All patients were followed for a minimum of 1 year. There was complete take of the nail bed graft in all cases. The nail, when it crossed over the suture line always became adherent to the nail bed graft. All patients in Group I and Group II had sufficient nail growth to give an excellent cosmetic result. The surgical