

Discussion

Reconstruction of Fingertip Amputation: Necrosis Is Expected

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The first case of replantation of the thumb was reported by Komatsu and Tamai in 1968 [1]. Recently, the quality of reconstruction and replantation in fingertip amputation from the distal unula have been improved. Even microsurgical replantation of amputated children's fingers became possible with a fine microsurgical technique.

However, the fingertip amputations from severe avulsion or crushing injury may prove challenging, especially in such cases where the transected blood vessel cannot be identified. When the necrosis of the amputation stump by either spasm or thrombosis is suspected after microreplantation, the surgeon can perform several surgical or nonsurgical procedures to improve the survival rate of the amputation stump.

In the past, the subcutaneous pocket method in the areas of the groin, axilla, or chest was used for the impossible microsurgical replantation of the finger amputation. In 2001, Arata et al. [2] reported using the palmar subcutaneous pocket for fingertip replantation with a composite graft. However, whether the subcutaneous pocketing method should be the first choice remains questionable because the requisite 2 to 3 week fixation period could result in joint stiffness and prolonged rehabilitation.

There are a number of factors related to the success rate and complications in replantation and reconstruction of a fingertip amputation. These factors include patient age, sex, occupation, hand dominance, pre-existing medical condition, vasculopathy, tobacco use, amputation level and site, patient motivation and cooperation, and surgical method.

In cases of microsurgically impossible replantation of a fingertip amputation, composite graft with either induced limited hypothermic therapy or the wet dressing technique and hyperbaric oxygen therapy may allow graft survival in pediatric patients without joint stiffness [3].

A 2nd toe pulp free flap or other free flap can be very effective for sensory recovery and durability of the fingertip in reconstruction of a fingertip defect with useless amputated segments.

However, the increased microsurgical technical requirements and hospital stay for the patient are drawbacks [4].

Local flaps such as a volar V-Y advancement flap or a lateral V-Y advancement flap could allow for a short recovery interval and preserve sensory innervation, especially in cases of either dorsally oblique or transverse complete amputation. Digital artery perforator flaps, such as a propeller flap, are also good alternative choices. If thrombosis and spasm threaten replantation survival after microreplantation, sequential use of a microsurgical technique and pocketing of composite graft method described by Kim et al. [5] in 2001 is a valid alternative management technique in these cases.

In conclusion, microsurgical replantation of fingertip amputations at the level distal to the lunula can prove challenging, especially if microvascular anastomosis is in question. For each therapeutic option discussed above, the factors which effect the outcome and complication rate should be guidelines deciding the indication.

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