The use of modified Kutler method for the treatment of amputation of the fingertip.

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Introduction

We think that the first choice of amputation of fingertip is replantation. But in the case of absence of amputated finger or failure of replantation, we choose pedicle flap for cover the skin and soft tissue defect if the patient hope to preserve longer stump. Kutler described a technique of bilateral V-Y advancement flap for reconstructing fingertip amputation in 1947. In original Kutler methods both triangular flaps are elevated by only skin incision without undermining subcutaneous tissue. Thus by this method, flaps are advanced distally only from 3 to 4 mm distance. In this study, we show a newly developed bilateral V-Y advancement flap (modified Kutler method) and evaluated the outcomes of this local flap.

Materials

We reviewed 21 cases (men, 21; women, 1; average age, 47 years) of amputation of the fingertip from July 2009 to February 2016. The injury sites were as follows: thumb (1), index finger (6), middle finger (7), ring finger (4), and little finger (3). Nineteen cases were injured in crush, and 2 were in clean cut. The average follow-up period was 188 weeks. Sensory disturbance and pain were examined at the final follow-up.

Methods

Inverted triangular flaps, the apex of those were placed on distal interphalangeal joint, were designed in radial and ulnar side of amputated finger. The volar incision was slightly undermined but left attached to subcutaneous tissue, and the dorsal incision was made to periosteum in both flaps. Both dorsal incisions were connected anterior to distal phalanx and volar subcutaneous tissue which include two flaps was separated from distal phalanx. Finally both flap are connected with only neuro-vascular bundle and surrounding fat tissue. Because of this maneuver, mobility of both flaps was greater than original Kutler method. Moreover flexion of distal phalangeal joint help to advancement of both flaps.

Results

All flaps survived.
Numbness emerged immediately after the operation in 17 patients of all 21 patients. And this symptom disappeared over time in 9 cases, but partially remained in 8 cases at the final follow-up examination.
Hypersensitivity emerged immediately after the operation in 8 patients of all 21 patients. And this symptom disappeared over time in 3 cases, but partially remained in 5 cases at the final follow-up examination.
Hypesthesia emerged immediately after the operation in 13 patients of all 21 patients. And this symptom disappeared over time in 3 cases, but partially remained in 10 cases at the final follow-up examination.
In no patients, anesthesia emerged immediately after operation. Pain due to an attack merged immediately after the operation in 10 patients of all 21 patients. And this symptom disappeared over time in 9 cases, but partially remained in 1 cases at the final follow-up examination.
Coldness merged immediately after the operation in 6 patients of all 21 patients. And this symptom disappeared over time in 1 cases, but partially remained in 5 cases at the final follow-up examination.
Affected finger were useful in 18 patients and not useful in 3 patients. Of three cases, one was not useful because of pain, one was of hypersensitivity, and one was one was of hypesthesia.

Discussion

Complications of Kutler method contain neurological deficit and vascular insufficiency. Traction or damage of nerve-vascular bundles caused neurological deficit and vascular insufficiency.
Neurological deficit results in numbness, hypersensitivity, hypesthesia and pain
And vascular insufficiency results in ischemia, congestion, necrosis of flap, and coldness.
In Atasoy method, which is volarly advancement V-Y flap in distal phalanx, occurrence of numbness, hypesthesia, pain and cold intolerance is relatively higher like this modified Kutler methods. Advancement of small flap in dital of DIP joint may inevitably cause traction or damage of nerve-vascular bundles.

Reference