Al-Azhar Med. J . (Surgery). *Vol. 52 (2), April, 2023, 635-648*
DOI: 10.21608/amj.2023.291654
https://amj.journals.ekb.eg/article_291654.html

EVALUATION THE OUTCOME OF SENSATE AND NON-SENSATE TISSUES FOR FINGERTIP RECONSTRUCTION

By

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ABSTRACT

Background: The fingertip is the portion of the digit distal to the insertion of the flexor and extensor tendons on the distal phalanx. The volar surface of the fingertips contains grooves and ridges, uniquely patterned for each individual, termed fingerprints. The digital arteries and nerves arborize or trifurcate near the distal interphalangeal joint.

Aim of the Work: Evaluation of the outcome of sensate and non-sensate tissues for fingertip reconstruction.

Patients and Methods: This study attempts to show the benefits of using different modalities for fingertip reconstruction in cases that presented in El Hussein and El Haram hospitals. Thirty-five cases of fingertip amputation were examined and managed using different techniques. In addition of managing these cases, we followed these cases over a 6 months period of time after first presentation and intervention to assess the outcome and any possible complications.

Results: In this study, according to the Allen's classification the majority (34.2%) of cases showed amputation level class II. Only 5 cases (14.2%) did not have bone exposed. The middle finger was the most injured in our study (34%). Seven (20%) cases showed postoperative infection. Eighteen (51.4%) cases got involved in the physical treatment/ occupational therapy. Ten (28%) cases had numbness over the injured finger. Only Eighteen (51.4%) cases completely survived.

Conclusion: Conservative wound management with dressings and a protective splint allows patients to avoid immobilization and donor site morbidity.

Keywords: Sensate and non-Sensate Tissues, Fingertip Reconstruction, Amputated Fragment.

INTRODUCTION

The digital nerves lie volar to the digital arteries near the fingertip. The fingertip is the organ of touch and feel and is abundantly supplied with sensory receptors. The dorsal surface of the fingertip comprises the nail fold, nail bed, and nail plate. The perionychium includes nail bed and paronychium complex. The paronychium is the skin surrounding the nail plate. EPONYCHIUM is the epidermis layer at base of the nail. The lunula is the germinal matrix at the base of nail bed *(Haneke, 2017)*.

The tip of the finger has a major functional role. It provides hand grip, fine grasping and tactile sensibility and is important to the finger's appearance.

Fingertip is abundantly supplied with sensory receptors that are very important

for different types of sensation. Superficial sensation as pain, temperature and tactile sensation. Deep sensation like steriognosis, two points discrimination and touch localization *(Germann et al., 2017)*.

Reconstruction of the fingertip aims to achieve stable coverage, restore acceptable appearance, obtain sensitivity, preserve length of finger and allow activities to be resumed as quickly as possible. The distal area of the fingertip must be distinguished from the proximal one, as their anatomy and characteristics differ. The distal fingertip is firm and can withstand deformity. The nail plate, distal phalanx tuberosity and radially arranged fibrous septa contribute to this firmness. It is essential to being able to pinch the fingers together. In contrast, the proximal finger pad is malleable. Fingertip injuries occur as hands are used to explore surroundings. Common types of injuries include blunt or crush injuries to the fingernail causing Subungual hematomas, nail root avulsions, and fractures of distal phalanx. Sharp injuries from knives and glass result in lacerations and avulsion types of soft tissue defects. Burns and frostbite are commonly involving fingertips *(Germann et al., 2017)*.

Children are treated differently than adults, and women are often treated differently than men. A digital injury in a manual laborer must be managed differently than in a musician, and the time frame required for return to work may affect the method of treatment *(Abdalla et al., 2017)*.

One third of all traumatic injuries affect the hands; the fingertips are the most frequently injured portion of the hand. The most complex aspect is determining which method is best for the patient. It is important to remember the hand has a very good capacity to heal spontaneously. Thus, the goal is not to cover the entire defect, but mainly critical structures such as bone or tendon. The remaining raw surface can be treated by second intention *(Abdalla et al., 2017)*.

Sensory evaluation aids a clinician in several aspects of patient care, such as diagnosing a disorder, identifying the severity of sensory impairment and determining the level of axonal regeneration and help or determining the best. Sensory evaluation helps in identifying the progression of a condition and establishing the level of hand function. Several sensory tests should be used during an assessment to assess sensibility due to the multiple components contributing to sensory function. Light touch sensation threshold, pain, temperature and two-point discrimination all of these are methods of sesnation assessment of fingertip reconstruction *(Abdalla et al., 2017)*.

The thumb has consistent dorsal digital arteries that vascularize its dorsal surface from the base to the nail. This anatomical difference from the long fingers means flaps can be made that are specific to thumb *(Germann et al., 2017)*.

The majority of patients recover from injuries to the fingertips within weeks of treatment and close follow-up. Patient education should include prevention of subsequent or new injury to digits, as well as possible outcomes based on injury severity. Additional complications include a decrease in the function of the affected finger due to stiffness, as well as

persistent pain or numbness *(Lok et al., 2017)*.

In this study the primary goal of treatment of an injury to the fingertip is a painless fingertip with durable and sensate skin, the knowledge of fingertip anatomy and the available techniques of treatment are of paramount interest.

AIM OF THE WORK

Evaluation of the outcome of sensate and non-sensate tissues for fingertip reconstruction.

PATIENTS AND METHODS

This study was conducted on 35 patients who were presented by fingertip injuries and were be managed by different modalities for fingertip reconstruction

Patients with fingertip injury were be observed for treatment and follow up in El-Hussein and El Haram hospitals from (May 2020 to November 2020).

The patients were complaining of fingertip imputed either single tip (30 pts) or multiple finger injury (5 pts), includes:

- Thumb: 2 cases.
- Index: 8 cases.
- Middle finger: 12 cases.
- Ring finger: 10 cases.
- Little finger: 3 cases.

They were (30) males or (5) females.

Inclusion criteria:

- Cases age ranges between 10 to 60 years.
- Cases with single or multiple fingertip amputation.
- Cases need coverage of fingertip (exposed bone).
- Early cases in 1st 24 hrs in trauma.
- Clean sharp injury.
- Types of defects.

Exclusion criteria:

- Cases with peripheral vascular disease.
- Cases with co-morbidities (like DM).
- Cases with previous scar in flap design
- Previously burned skin.
- Presence of primary infection.

Surgical management:

- Patients were admitted to ER department they were examined clinically to assess the fingertip injury and were investigated.
- The investigation includes:

1. Routine labs.
2. Radiology (x-ray) hand.

- The patients were also assessed by preoperative photography.
- The patients were prepared for surgical intervention by repairing fingertip injury using different modalities of reconstruction.

Operation:

1. Marking of the flap for fingertip amputations, a triangular flap is planned obliquely toward the contralateral side of the defect. If possible, it is desirable that the tip point of the flap does not traverse the distal interphalangeal joint crease.

Figure (1): Marking of the flap.

2. Anasthesia: all anesthesia were done using local (ring anesthesia)

Figure (2): Ring Anasthesia.

3. Tourniquet was used.
4. Loop magnification was helpful.
5. Incision was done: according to marking we start by doing transverse incision full thickness then on reaching the tip of the flap, a back-cut incision is carried out for approximately one-third of the short edge. The flap is based on the ipsilateral neurovascular bundle and it can be totally elevated, with special attention paid to preserve the small neurovascular branches. According to the desired degree of flap mobilization, branches from the contralateral neurovascular bundle may be divided as soon as the surgeon is convinced that the ipsilateral pedicle is intact. The raised flap is mobilized distally toward the fingertip, and its long edge is rotated and advanced across the defect on the pivot point located on the preserved skin paddle (Tuncali et al., 2006). After flap transposition, it is sutured by simple interrupted nonabsorbable 5-0 sutures and the donor area is closed using the

V-Y principle where, if needed, a Z-plasty can be introduced to facilitate closure. This is usually done when more rotation than advancement is needed and had to be performed in only two cases in our series. The Z-plasty design can be drawn at the beginning of the operation but used only when necessary.

Figure (3): Form of the flap after elevation.

Post operative: medication (antibiotic, analgesia) and repeated dressing.

Follow up visits:

- **1st visit:** 48hours after operation for assessment of flap vascularity.
- **2nd visit:** 1 week after operation for clinical examination and follow up of post operative complications as (infection, hematoma, flap loss) and photography.
- **3rd visit:** 15-30 days for photography, physiotherapy and follow up of partial lost (using repeated dressing till healing by 2ry intention. 3 and 6 month's for photography.

Post operative complications:

- Infection → change medication and more frequent repeated dressing.
- Partial flap loss → repeated dressing till 2ry healing occurs.
- Complete flap loss → repeated dressing till 2ry healing occurs.
- Numbness → reassuring and physiotherapy.
- Scars.

Physical Treatment/Occupational Therapy.

Introduction:

Physical treatment/occupational therapy plans should be determined based on:

- Individual patients.
- The nature of the injury.
- Any concomitant diagnoses.
- The strength or stability of the operative intervention.

In all cases, the treatment plans focus on wound care, edema reduction, the need to provide protection or stability, and patient education to facilitate a partnership and compliance during the recovery process.

Wound Care and Scar Management:

Scar management begins at the initiation of therapy particularly when a wound is present. Promoting wound healing and facilitation of edema reduction both lead to more pliable scar tissue. Although there is less tissue gliding in the fingertip relative to other areas of the hand, it is still important to address scar tissue as excessive, non-pliable scar tissue can have a devastating impact on the sensory abilities of the normally highly sensate fingertips *(Austin, 2015)*.

Suture lines can generally be gently cleansed with soap and water without heavy perfumes. When pins extrude from the skin, daily cleansing with a cotton swab and a 50/50 mixture of saline and hydrogen peroxide is recommended to prevent pin-site infections and possible osteomyelitis. Pin sites are kept dry at all other times.

Dressings that become adherent to the wound bed can damage epithelial buds and retard wound closure. A layer of petroleum-impregnated mesh applied directly over the wound helps prevent adherence. If adherence does occur, the dressing can be soaked with either saline or a 50/50 mixture of saline and hydrogen peroxide until it loosens *(Goldberg & Diegelmann, 2020)*.

The presence of tough slough or eschar in the wound effectively stalls the healing process in the inflammatory stage. This creates a cascade of cellular response that significantly delays wound healing and renders the wound more susceptible to infection. Prompt removal of eschar and slough is necessary. There are multiple removal methods including sharp debridement, surgical debridement, and use of an enzymatic agent *(Maklebust & Sieggreen, 2001)*. Once the eschar is removed, use of a dressing containing silver is often recommended. Silver has antibacterial properties and also promotes healing *(Nunan et al., 2014)*.

A common misconception is that range of motion should be delayed until the wound is healed. Waiting for wound closure can result in significantly decreased range of motion. It is important to educate the patient on this fact as it is counterintuitive for patients to move when a wound is present. Reassurance that the wound will heal and that range of motion and function are more likely to be preserved with prompt initiation of active movement is necessary *(Pronovost & Vohr, 2010)*.

Edema reduction techniques should be implemented on the first visit to the clinic in conjunction with wound care. Elevation above the heart, elevation combined with active range of motion (overhead fisting), compression wrapping, manual lymph drainage, cold application, continuous passive motion, and electric stimulation are techniques used to reduce edema. In fingertip injuries, wrapping with a self-adhesive tape is usually sufficient to address localized edema. Whenever applying compression to the finger or hand, check capillary refill after application and educate the patient on the signs of blood flow compromise *(Sittig, & Richardson, 2010)*.

Scar formation is necessary for wound healing; however, excessive scarring can lead to joint contracture, pain, anxiety, and a decrease in function. It is important to begin scar management before a significant problem presents as it is much

easier to prevent excessive scarring than to remodel it after the fact. Fingertip scar management is of particular import due to the high density of sensory receptors and the intrinsic integration of the fingertips in activities from power gripping to the finessing of guitar strings or a needle and thread *(Mari et al., 2015)*.

Silicone gel sheeting is an excellent and routinely used scar-remodeling product that works best on flat surfaces. Silicone gel sheeting is flexible, allowing unrestricted active range of motion; however, it must be held in place.

Scar massage is an adjunctive intervention that is begun promptly upon wound closure *(Austin, 2015)*.

Sensory Testing:

Assessing both slowly and quickly adapting fibers in the fingertips is essential for establishing a baseline for sensation and developing a logical, sequential treatment plan for sensory reeducation *(Warwick & Dunn, 2018)*.

It has been well established in the literature that there is no one sensory test that accurately assesses all sensation or accurately predicts overall function. Standard practice in many hand clinics is to use several forms of testing in order to understand localization, acuity, threshold, discrimination, and protective sensation *(Novak, 2001)*.

Touch Threshold: Light Touch to Deep Pressure.

The Weinstein Enhanced Sensory Test (WEST) (Bio instruments, Connecticut, USA) is the latest in a series of monofilament-type pressure tests that began with Von Frey's use of hair of varying diameters to determine pressure thresholds more than half a century ago. The WEST is easy to use, quickly administered, and has good inter- and intra-tester reliability.

Tactile Discrimination:

1. Two-Point Discrimination: Static and Moving:

Two-point discrimination has long been the mainstay for physicians when attempting to isolate and identify the progression of reinnervation after nerve injury or repair. It is thought to be a good indicator of the quantity or density of innervated sensory receptors as well as return of object identification. In assessing static two-point discrimination, begin with the 5-mm distance probes. Randomly apply either one or two probes, holding for 5 s, with enough pressure to note minimal tissue deformation without blanching. Increase the probe distance in 1 mm increments until the patient identifies seven out of ten responses correctly. When testing two-point discrimination, position the instrument in a longitudinal fashion to avoid crossing into a separate innervation *(Jerosch-Herold, 2011)*.

2. Localization:

Decreased ability to localize touch is not unexpected post nerve injury, as regenerating axons often do not reconnect with their original mechanoreceptors no matter how accurate the nerve repair is. This results in altered representation of sensation within the hand. Patients often can "feel" a sensation but report that the stimulus is in a different finger or they can localize only to a generalized area and not a focal one. Localization mapping is useful in providing information regarding

degree of regeneration and associated functional use of the hand.

3. The Ten Test:

The ten tests evaluate light moving touch. It is a screening tool that allows the patient to compare a stimulus applied to the affected side with the unaffected side *(Novak & Mackinnon, 2005).*

4. Vibration Thresholds:

Perception of vibration is one of the first indicators of sensory reinnervation *(Kostakoglu, 1999).*

Sensory Reeducation:

Sensory reeducation is the process of reclaiming lost somatosensory representation as well as improving the patient's ability to perceive and discriminate touch through cognitive behavioral techniques. While more research is needed, sensory reeducation has been observed in the clinical setting to have a positive effect on improved localization, discrimination, stereognosis, and fine motor coordination. Improved function is a result of a combination of nerve healing and regeneration and of changes in the somatosensory cortex via neural plasticity.

The literature divides sensory reeducation into two phases:

- Phase I begins with the injury or repair.
- Phase II begins when the patient is able to perceive touch.

Sensory reeducation involves not only stimulation of tissue but focus, cognition, perceptual abilities, and memory as well. A quiet environment and a concerted, consistent effort on the patient's part are both necessary during sensory reeducation.

Phase I sensory reeducation with a multisensory approach is initiated immediately upon injury or repair with the intent of minimizing the amount of cortical territory lost. Several different techniques are recommended for inclusion in a home program which is performed in 10-min sessions, four to five times per day. Visual imagery has been shown to stimulate the sensory cortex. The patient is asked to simply imagine the affected area being touched. Mirror box use has resulted in some perceiving touch in the injured area while watching the unaffected hand receive stimuli. Additionally, direct observation of the affected hand being touched has been shown to stimulate the somatosensory cortex.

Phase II sensory reeducation is initiated once touch is perceived in the affected area. Begin with efforts aimed at improving localization. The patient is asked to watch point stimulation to the affected area provided by a small dowel or the eraser end of pencil. The stimulus is then repeated in the same location with eyes closed; the stimulus is then applied for a third time while the patient watches. During the activity, the patient should focus on what is seen and felt. It may be helpful to begin with those areas closest to the periphery of the injury. Once localization has improved, a focus on tactile gnosis, or the recognition of shapes and textures, begins. Incorporating the unaffected hand is often recommended.

Fingertip Hypersensitivity:

After a fingertip injury, patients will often go to extreme lengths to "protect" the injured area from as much sensory

input as possible. These patients are usually seen with the affected digit or digits sticking straight out while the other digits attempt the necessary manipulation.

It is important to present a graded desensitization program in order to ease anxiety and facilitate compliance.

It is common for hypersensitivity to persist after a fingertip injury. Hypersensitivity limits functional use and can cause a significant delay in return to work. A desensitization program should begin as soon as wound closure is noted and skin stability is present.

Rend all proposed the three-phase desensitization treatment protocol:

- **Phase I,** dowel textures the patient is instructed to use a series of ten dowels overlaid with varying textures ranging from smooth to very rough by rolling, rubbing, or tapping the dowel on the affected area for duration of 10 minutes.The patient begins with the dowel texture that he or she identifies as noxious.
- **Phase 2,** contact particles are used in the same manner and progress from soft to hard. The patient digs his or her hand into the appropriate particle for 10 min.
- **And phase 3,** vibration. A Mini Massager with three different heads (flat, round, and spot) is used for a 10-min period. Graded putty is also used for both desensitization and strengthening.

RESULTS

Age:

Our study cases age ranged between 16-55 years. The average age was 30.871. Six (17.3%) cases below the age of 20, sixteen (45.7%) cases between 20-30 years, seven (20%) cases between 30-40, four (11.5%) cases between 40-50 and only 2 (5.5%) cases above 50.

Table (1): Showing the age periods and number and percentage of cases involved in the study

Age Range	#	%
10-20	6	17.3
20-30	16	45.7
30-40	7	20
40-50	4	11.5
50-60	2	5.5

Sex:

Out of the 35 cases included, we managed 30 (85%) males and 5 (15%) females.

Injury Mechanism & Cleanliness:

Amputation cases usually are classified as traumatic or occupational. Out of the 35 cases included, 30 (85.7%) cases were occupational and only 5 (14.3%) cases were in the household field i.e., traumatic.

Seven (20%) cases were dirty/ contaminated cases upon admission, while twenty-eight (80%) were clean cases.

Amputation Level:

We used Allen's/ Ishikawa classification to categorize the level of fingertip injury in this study.

The classification is organized under these categories:

- **Zone I:** Five cases identified.
- **Zone II:** Twelve cases.
- **Zone III:** Ten cases.
- **Zone IV:** Eight cases.

Table (2): Tissue Survival Rate according to the zone

Zone	#	%	Tissue Survival Rate
I	5	14.3	3/5 (60%)
II	12	34.3	7/12(58.3%)
III	10	28.6	5/10(50%)
IV	8	22.8	3/8(37.5%)

Bone exposure:

Only 5 (14.3%) cases did not have a bone exposed in this study, while 30 (85.7%) cases showed exposed bone in the injury bed.

Oblique v/s transverse:

Only 4 (11.4%) cases had oblique injury line, while 31 (88,6%) showed transverse injury.

Finger Injured:

Thumb: Two cases.
Index: Eight cases.
Middle finger: Twelve cases
Ring finger: Ten cases
Little finger: Three cases.

Table (3): Number and percentage of injured fingers

Finger	#	%
Thumb	2	5.7
Index	8	22.8
Middle	12	34.3
Ring	10	28.6
Little	3	8.6

Hand Injured:

Right hand showed 24 (68.6%) cases, while the left hand showed 11 (31.4%) cases.

Smoking:

Only 15 (42.86%) cases were nonsmoker cases, while 20 (57.14%) cases were smokers.

Table (4): Cases according to smoking

Smoking	#	%	Survived#	Survived %
Yes	20	57.14	11	55
No	15	42.86	9	60

Comorbidities: DM, HTN:
DM: two cases had diabetes.
HTN: two cases were hypertensive.
Infection

Seven (20%) cases showed postoperative infection, which was later, treated with systemic and local antibiotic, while 28 cases (80%) did not show any sign of infection.

PT/OT

Out of the 35 cases included in this study, 18 (51.42%) cases involved in the physical treatment/ occupational therapy recommended after the surgical intervention; While 17 (48.6%) cases did not enroll in this treatment program.

Postoperative Sensation:

Fifty-five (71.4%) cases showed complete or partial return of sensation after a follow up period of 6 months and 10 (28.6%) cases had numbness over the injured finger which did not subside during the follow up period.

Survival & Loss:

- Tissue survival: Sixteen (45.7%) cases survived out of the total 35.
- Tissue partial loss: twelve (34.3%) cases showed partial loss. These cases showed areas of necroses or raw areas which were spontaneously closed by secondary intention during the follow up period.
- Tissue complete loss: seven (20%) cases showed complete loss of the flap during the study period, and these cases were debrided and healed by secondary intention.

Table (5): Survival/Loss number and percentage

Survival/Loss	#	%
Survival	16	45.7
Partial Loss	12	34.3
Total Loss	7	20

DISCUSSION

This study attempts to show the different modalities of treatment benefits of using sensate and non-sensate tissues for covering 35 cases of fingertip amputation that presented in Emergency Department of El Hussein and El Haram Hospitals.

There are different modalities of treatment for fingertip reconstruction. However, it is feasible only when the amputated fragment is available, in good condition, and well preserved. Immediate repair is preferable for the best outcome. The management of these injuries can be challenging because of the lack of locally available tissue for reconstruction.

In these instances, the reconstructive surgeon is confronted with the dilemma of choosing the best reconstruction technique that meets the patient's needs. Options for treatment of fingertip injuries include primary spontaneous healing, shortening of bone and primary closure, composite grafts, and the wide variety of flaps.

We are going to compare the results of using different modalities of treatment for fingertip reconstruction.

In our study, fifty-five cases were followed over a sex month period. Age ranged between 16-55 years with average age 30.871. Eighty five percent of the cases were males (30 cases) while 15% were females (5 cases), 85.7% were occupational according to the cause and the 14.3% were traumatic/ household, according to the Allen's classification the majority (34.2%) of cases showed amputation level class II. Only 5 cases (14.2%) did not have bone exposed. The middle finger was the most injured in our study (34%). Seven (20%) cases showed postoperative infection. Eighteen (51.4%) cases got involved in the physical treatment/ occupational therapy. Ten (28%) cases had numbness over the injured finger. Only Eighteen (51.4%) cases completely survived.

Amputation cases usually are classified as traumatic or occupational. Out of the 35 cases included, 30 (85.7%) cases were occupational and only 5 (14.3%) cases were in the household field i.e., traumatic.

Seven (20%) cases were dirty/ contaminated cases upon admission, while twenty-eight (80%) were clean cases.

Fifty-five (71.4%) cases showed complete or partial return of sensation after a follow up period of 6 months and 10 (28.6%) cases had numbness over the injured finger which did not subside during the follow up period.

In general, the different modalities of treatment provided good protective padding and aesthetic contour for the fingers, and all incisions healed with inconspicuous scars. Fifty five (71.4%) cases showed complete or partial return of sensation after a follow up period of 6 months and 10 (28.6%) cases had numbness over the injured finger which did not subside during the follow up period.

Most patients could return to work or their normal routine in a period of approximately 4 to 6 weeks after operation.

CONCLUSION

Fingertip injuries are the most common injuries in hand trauma patients. The major cause for adult patients is occupational accidents etiology. There are several classifications for fingertip injuries. Treatment options vary depending on the injury mechanism, defect’s size and plane, surgeon’s intention, patient’s needs, condition of the stump and the amputated part. However, there is a consensus that replantation is the best choice by maintaining the length of the finger and the normal anatomy of the nail complex. If replantation is not possible, reconstruction ladder could be used for fingertip injuries: secondary healing, primary closure, skin grafting, homodigital, digital artery perforator flaps, local and regional flaps.

There is no difference between sensate and non-senate tissues for fingertip reconstruction. Conservative wound management with dressings and a protective splint allows patients to avoid immobilization and donor site morbidity. Good results with near-normal sensibility, minimal cold intolerance, and tip durability are usually achieved. Early return to work is possible, lowering the

overall healthcare costs and burden on society *(Franche et al., 2005).*

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تقييم نتائج استخدام الأنسجة الحسية والغير حسية في إصلاح إصابات أطراف الأصابع باليد

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الخلفية: طرف الإصبع هو جزء من الإصبع البعيد لإدخال الأوتار المثنية والأوتار الباسطة في الكتائب البعيدة. يحتوي السطح الراحي لأطراف الأصابع على أخاديد وحواف، منقوشة بشكل فريد لكل فرد، تسمى بصمات الأصابع. تتشابك الشرايين والأعصاب الرقمية أو تتشعب بالقرب من المفصل السلامي البعيد.

الهدف من العمل: تقييم نتائج الأنسجة الحسية وغير الحسية لإعادة بناء أطراف الأصابع.

المرضى والطرق: تحاول هذه الدراسة إظهار فوائد استخدام الأساليب المختلفة لإعادة بناء أطراف الأصابع في الحالات التي ظهرت في مستشفيات الحسين والهرم. تم فحص خمس وثلاثين حالة بتر أطراف الأصابع ومعالجتها باستخدام تقنيات مختلفة. بالإضافة إلى إدارة هذه الحالات، تابعنا هذه الحالات على مدى 6 أشهر من الوقت بعد العرض والتدخل الأول لتقييم النتيجة وأي مضاعفات محتملة.

النتائج: في هذه الدراسة وبحسب تصنيف ألن فإن الغالبية (34.2٪) من الحالات أظهرت البتر على مستوى الصنف الثاني. فقط 5 حالات (14.2٪) لم تتعرض للعظام. كان الإصبع الأوسط هو الأكثر إصابة في دراستنا (34٪). سبع (20٪) حالات ظهرت عليها العدوى بعد العملية الجراحية. ثمانية عشر (51.4٪) حالة شاركت في العلاج الطبيعي/ العلاج الوظيفي. 10 (28٪) حالات خدرت في الإصبع المصاب. نجا تماما ثمانية عشر (51.4٪) حالة.

الخلاصة: التدبير الوقائي للجروح بالضمادات والجبيرة الواقية يسمح للمرضى بتجنب الشلل والاعتلال في موقع المتبرع.

الكلمات المفتاحية: أنسجة حساسة وغير حساسة، ترميم أطراف الأصابع، شظية مبتورة.