

**INTEREST OF THE ABDOMINAL FLAP-GRAFT IN THE COVERAGE OF LOSS OF SUBSTANCE OF THE FINGERS: A CASE REPORT**

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ABSTRACT Coverage of finger substance loss presents a significant challenge due to the specific topography of the loss, the patient's condition, and the functional prognosis of the hand. Despite the range of available surgical techniques, including local flaps, the abdominal flap-graft remains a reliable therapeutic option. It effectively combines the benefits of both grafts and flaps while minimizing their disadvantages. This work demonstrates the value of the abdominal flap-graft through a clinical case involving substance loss of the 3rd left finger.

KEYWORDS : Substance loss, fingers, injury, abdominal flap-graft.

INTRODUCTION

Covering finger substance loss seems achievable due to the variety of surgical techniques available, which can help preserve the functional prognosis of the hand. However, this type of coverage presents a significant surgical challenge, where the abdominal flap-graft has proven effective [1].

Our work highlights the importance and value of this flap in cases of therapeutic impasse following a critical assessment of the lesions and encourages its use in emergency situations.

Clinical Case

A 65-year-old diabetic and hypertensive patient, undergoing treatment for a fractured femur, was admitted to the emergency department of Mohamed V Military Training Hospital for the treatment of multiple wounds sustained in an attack.

Upon admission, the assessment of injuries to the left hand revealed: a palmar wound with tendon injuries, associated with sub-amputation of the 2nd finger and loss of substance of the medial surface of the 3rd left finger, with exposure of the proximal interphalangeal joint (Fig. 1). The right hand had multiple wounds with a sectioned ulnar pedicle. Additionally, the patient had both Achilles tendons severed.

An emergency procedure was attempted to salvage the 3rd finger, using an advancement flap combined with a total skin graft for the persistent loss of substance, performed in a single-stage operation. The postoperative course was complicated by necrosis of the total skin graft (Fig. 2).

Additionally, tendon repair was performed using Kessler sutures, and the right ulnar pedicle was repaired with direct sutures. Due to the sub-amputation of the 2nd finger and the section of the collateral pedicle of D2, as well as multiple wounds on the hand and wrist, local flaps were not feasible, leading to the decision to use an abdominal flap-graft for coverage.

The creation of this abdominal flap-graft involves several stages:

- Preoperative Planning: A pre-established surgical plan, using a template to reproduce the substance loss on the abdominal wall skin; in our case, the skin from the contralateral flank was used.

- Patient Positioning: The patient is positioned supine, and under local anaesthesia, hydrodissection is performed by infiltrating Klein's solution using a syringe.
- Incision and Detachment: An incision with a No. 10 cold blade to free both edges of the flap, followed by skin detachment using Metzenbaum scissors.
- Defatting: The distal part of the flap is defatted to reduce its thickness without compromising vascularisation.
- Donor Site Closure: The donor site is closed first, after detachment and approximation of the skin edges.
- Flap Placement: The abdominal flap-graft is then placed by wrapping it around the injured finger, using separate non-absorbable sutures (Fig. 3).
- Immobilisation: The left limb is immobilised to prevent traction (Fig. 4).

The second stage of the operation involved weaning the abdominal flap-graft after three weeks, under local anaesthesia.

Functional rehabilitation began immediately after weaning was completed. No necrosis was observed, but some thickness persisted in the flap, necessitating subsequent defatting, which the patient refused, being satisfied with the result (Fig. 5).





Figure 1: Loss Of Substance Of The 3rd Finger + Exposure Of The Proximal Interphalangeal Joint



Figure 2: Total Skin Graft Necrosis



a



b



c

Figure 3: Intraoperative Aspect
A. Abdominal Flap-graft Tracing
B. Removal Of Abdominal Flap + Suture Of Donor Area
C. Immediate Post-operative Aspect



Figure 4: Post-operative Aspect



Figure 5: Immediate Post-weaning Results

DISCUSSION

Loss of substance in the fingers is a significant therapeutic challenge and surgical emergency, due to both the etiologies involved and the difficulty in achieving satisfactory reconstruction. There is no standardized approach, although several authors recommend replantation, which depends largely on the mechanism of skin avulsion and its direct impact on the vascularisation of the remaining fragment. The success rate of replantation varies in the literature and can sometimes result in failure [1-5].

Other authors even suggest amputating the injured finger for a better functional outcome. However, the psychological impact, particularly on younger patients, and the need to preserve osteotendinous structures remain crucial factors [5-8].

In our case, to preserve the patient's skin and minimize the length of hospital stay, we initially opted for coverage of the 3rd finger's substance loss with a local advancement flap supplemented by a total skin graft. This approach failed due to necrosis of the skin graft, which may or may not have been related to the patient's specific conditions.



Figure 6: Algorithm For The Management Of Loss Of Substance In The Hand [18]

Digital reconstructions thus present a real challenge, with the primary goal of restoring substance while ensuring digital mobility and sensitivity regeneration [5] (Fig. 6). Several surgical techniques can be proposed. In our case, given the sub-amputation of the 2nd finger and the section of the collateral pedicle of D2, as well as the palmar surface damage, the choice was between a McGregor inguinal flap and a flap-graft described by Colson [9-11].

We opted for abdominal flap-graft reconstruction, which is described as a flap initially defatted, nourished by its pedicle, and then by its deep surface like a graft [1]. The reasons for our choice include the need to

cover exposed bone structures, and the many advantages of Colson's flap-graft: it is reliable, easy and quick to lift, has good vitality, and provides a large donor site surface for covering the entire hand, with immediate mobilisation of the fingers post-weaning. Disadvantages are rare and mainly involve the three-week immobilisation period, which can lead to stiffness requiring functional rehabilitation and observed macerations [5, 10-17].

Possible complications include superficial dissection leading to necrosis, infection, or haematoma [18, 19].

CONCLUSIONS

Abdominal flap-graft coverage for finger defects remains a reliable treatment option. It combines the advantages of both grafts and flaps while mitigating their disadvantages [1, 11].

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