

CASE REPORT

Abdominal Flap: A Reconstructive Option for Hand Defect in Rural Setting

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Received: 7 June 2018

Accepted: 13 August 2018

Keywords: degloving injury, hand,
reconstruction, abdominal flap

ABSTRACT

Reconstruction of hand injury is the challenge for the surgeon especially in rural settings. This case report is about a 10-year-old boy, who sustained large degloving wound of dorsum of right hand with extensor tendon injury following a road traffic accident. We performed a staged abdominal flap with tensor fascia lata graft for tendon reconstruction as microsurgery facilities was not available. Post-operatively he was subjected to physiotherapy and he has a functional right hand. This case report aimed to highlight abdominal flap as reconstructive option as compared to skin grafting which is reproducible with limited resources. Besides that, overall exposure to all surgical options is of paramount importance in the training of trainees to equip them with skills to serve in rural setting.

INTRODUCTION

Hand is an intricate part of the body that plays an essential role in social functioning, expression, productivity and interactions with our environment¹. Various degree of soft tissue defects are encountered in our daily practice. The principle of basic soft tissue coverage includes adequate surgical debridement, early and appropriate antibiotics, immobilization, obliteration of dead space, drainage when indicated and coverage of the wound with well vascularized tissue².

Full thickness soft tissue hand injury is a challenge for surgeons in rural area without

easy access to microsurgical expertise³, Microvascular free tissue transfer has been a major advancement in the treatment of soft tissue defects of the hand⁴. Logistic and socioeconomic constraints leave surgeons in dilemma and previously resulted in amputation of the hand or skin grafting which had inferior outcomes⁵. Application of an easily reproducible local flap technique is surely an added armamentarium for surgeon in rural setting to salvage the limb⁶. Herein, we would like to report a case of severe degloving injury of right hand reconstructed with an axial based abdominal flap to salvage his hand⁷.

CASE PRESENTATION

A 10-year-old Bajau ethnic boy involved in motor vehicle accident and sustained degloving injury to dorsum of right hand with full thickness skin loss, subtotal extensor tendon loss of index and little finger (Figure 1). First stage (at hospital) involved surgical wound debridement followed by tagging of tendon with nylon sutures. Subsequently he was on daily dressing followed by negative pressure wound therapy as part of wound bed preparation (Figure 2). Following counselling on the functional benefits of a flap, parents agreed for flap reconstruction using abdominal flap and tendon reconstruction using tensor fascia lata (Figure 3).

Upon achieving a favourable bed, we proceeded with the soft tissue reconstruction of dorsal aspect of right hand with abdomen flap and tendon reconstruction with tensor fascia lata (Figures 3 and 4). Flap planning was done with outlining the left superficial circumflex iliac vessel using a handheld Doppler (Echo Sounder, Hadecco). Tubed flap design was made on the left groin and flap was raised at the sub-fascial plane (Figure 5). Flap was inserted to the defect followed by partial closure of the donor defect done in

layers. Right upper limb attached to the flap was immobilized with a custom-made splint and kept in position for three weeks, care was taken not to kink the pedicle. Flap division and refashioning was done three weeks later (Figures 6 and 7). Skin grafting was applied at a few raw areas. Post debridement with extensor tendon reconstruction (tensor fascia latae) was done (Figure 8). He was advised for active and supervised physiotherapy and was discharged well. The cosmetics appearance of the right hand was good (Figure 9). The donor's scar site looked healthy (Figure 10).

During the last review, the patient could achieve acceptable range of motions of the wrist and fingers. Above all, he could use his hand for basic daily usage, whereby he is able to hold a cup and able to do legible handwriting.



Figure 1 Initial wound (degloving injury of the dorsum of the right hand)



Figure 2 Wound bed post vacuum-assisted closure dressing for a week duration



Figure 3 Flap preparation done by outlining the left superficial circumflex iliac vessels using a handheld Doppler



Figure 4 Abdominal flap with pedicle harvested



Figure 5 Flap inset to the defect followed by partial closure of the donor defect done in layers



Figure 6 Detachment of matured flap



Figure 7 Detachment of matured flap



Figure 8 Post-debridement with extensor tendon reconstruction (tensor fascia latae)



Figure 9 Final product of the flap



Figure 10 Donor's site scar

DISCUSSION

Dorsum of the hand has complex anatomy and is covered by thin pliable skin envelope. Any form of trauma risks the exposure of these structures which is responsible for the fine motor movement of the hand. Skin grafting produces inferior outcome and has higher risk of tethering of tendon which prevents its free gliding movement⁷. Reconstruction of full thickness defect using a distant pedicled flap is an option when free tissue transfer facilities are not available.

The constant anatomy of the abdominal flap and the ease of raising the flap will surely become handy when dealing with full thickness defect of the hand. Besides that, this flap provides adequate bulk of tissue and contours very well to the skin of the dorsum of hand. Despite the disadvantage of two-staged surgery and need for immobilizing the upper limb for three weeks, we performed abdominal flap which is surely far superior to skin grafting which will cause problem to the tendon gliding that leads to significant functional deficit⁸.

Covering soft tissue defects remain challenging for orthopaedic surgeons, especially those in resource-challenged facilities². Staged abdominal flap is an armamentarium in the reconstruction for full thickness dorsum of hand defect especially in remote area when microsurgical facilities are not easily available.

Many of such hand defects cases could be resolved simply and with good outcomes on a more local level if the surgeons at the smaller facilities were trained in the use of flaps and the principles of basic soft tissue coverage². Furthermore, medical officers in rural settings would be able to perform staged abdominal flaps, provided they are given training and exposure.

CONCLUSION

Hand defects could also be resolved successfully by using abdominal flap in remote area with limited microsurgical facilities.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this case.

CONSENTS

Written informed consent was obtained from the patient to publish the case with its related pictures. A copy of the written consent is available for review by the Chief Editor.

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