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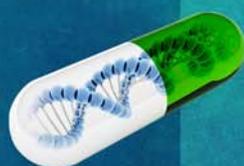
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Research Paper

## COMBINED ABDOMINAL FLAP FOR MAJOR HAND RECONSTRUCTION

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**Aims:** Complete cover of both palmar and dorsal aspects of hand and distal forearm in severe hand injuries is a difficult task. This study presents a technique of providing complete skin cover for total degloving injuries of the hand and distal third of the forearm with combined use of both hypogastric and groin flap. **Materials and Methods:** Total 8 cases were included in the study who were admitted to the plastic surgery ward with major soft tissue injury to the hand from August 2011. Combined hypogastric and groin flaps were raised according to the size of the defect. maximum defect size covered is 20\*25 cm. **Results:** of the 8 patients included In the study 6 were males, 1 female, 1 child with average age 15-57 years. Flaps were divided at 3 to 4 weeks interval, 6 cases had complete flap survival, 2 case had partial flap necrosis and were managed with flap debridement and reinsert. Donor defect morbidity included partial graft loss managed by ssg. **Conclusion:** The dissection combined groin and hypogastric flap is straightforward and can be easily performed by a single surgeon. The combined use of these flaps allows stable coverage of sizable dorsal and palmar wounds of the hand.

**Keywords:** Abdominal flap, Hand injury, Reconstruction

### INTRODUCTION

Several surgical techniques using local/distant/microvascular flaps have been developed to resurface hand and forearm defects. Combined abdominal flaps can be safely raised to resurface large defects of the hand as they are simple, easy and versatile. The earlier reports of successful reconstruction of degloving hand injuries by abdominal flaps can be traced back to 1898, when Biggs performed a Random Pattern abdominal

flap to resurface a contracted palmar burn scar on the hand.

### MATERIALS AND METHODS

Study was conducted from August 2011 to September 2012 in the Dept. of Plastic Surgery & Burns Victoria Hospital, BMC&RI, Bangalore. 8 patients were included in the study. Patients with Degloving and crush injuries of hand and Severe post burn contracture of hand were

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included in the study. Patients with severe crush injury of hand with doubtful viability and defects of hand which can be covered by Groin or Hypogastric flap alone were excluded from the study. Maximum follow up period was 2 years.

## SURGICAL TECHNIQUE

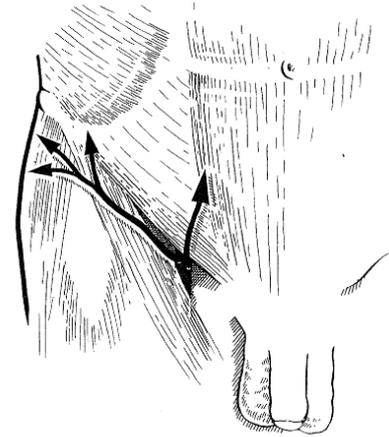
Adequate debridement of all degloving injuries of hand was done. In case of post burn contracture of hand, an adequate release was obtained. Combined Groin and Hypogastric flaps were marked according to the size and shape of the defect. Landmarks for Flap Marking: ASIS, PT, IL, SA (Figure 1).

**Figure 1: Markings for Combined Abdominal Flap**



Flaps were raised including the fascia. Defect size ranged from 15/20 cm to 20/25 cm over the hand and distal forearm. Preoperative doppler was done to locate the SIEA in all patients. Flap vascularity is based on both superficial circumflex iliac artery and superficial inferior epigastric artery, both branches of femoral artery at groin (Figure 2). All flaps were divided at 3 weeks. Final flap inset was given 1 week later. Donor defects were

**Figure 2: Vascular Basis of Combined Abdominal Flap**



The perfusion sources of the skin of the hypogastrium. These are formed by elements of the vascular 'cartwheel' in the groin, the superficial epigastric and the superficial circumflex iliac vessels which combine with the perforating system shown

covered with split skin graft and a bolus dressing applied.

## OBSERVATIONS

8 patients were included in the study of which 7 were male patients and 1 was a female patient. Age ranged from 15-57 years. Left hand was involved in 5 pts and Right hand was involved in 3 pts. 6 pts had complete survival of flaps with few additional procedures for flap debulking. 2 pts had partial flap necrosis which were managed by debridement and skin grafting. Partial graft loss was seen in 3 pts at the donor site. Permanent contour deformity at the donor site was complained by 4 patients. Marginal hypertrophic scarring was seen in 1 patient. Reasonable functional recovery of hand was obtained in 6 patients.

**Case 1:** 55 year old male pt, H/o RTA with injury to Left hand. X-Ray; Normal, Defect size after debridement-20/25 cm.

Figure 3: Details Given as Case 1 – Crush Injury LT Hand



**Case 2:** H/o crush injury to LT hand. All the devitalized extensor tendons were debrided. Defect size 18/20 cm.

**Case 3:** 45 year male patient. Post burn contracture of RT hand. Groin flap was used to cover dorsal defect, Hypogastric flap was used to cover 1<sup>st</sup> web space.

Figure 4: Details Given as Case 2 – Crush Injury LT Hand



**Figure 5: Post Burn Contracture of RT Hand**

## DISCUSSION

Exposed tendons and bones in degloving injury of hand needs early debridement and cover. Flap cover helps in future reconstructions. Defects of the hand and forearm may be covered by local, distant, or free flaps, depending on the general condition of the patient and the local condition of the wound and donor site. Free flaps are an option to reconstruct soft tissue defects of the hand and forearm. They offer flexibility in size, shape, and pt positioning. In Hospitals where free flap is not the first option due to various reasons, Abdominal

flaps are major rescuers. Random and axial pattern abdominal flap were frequently used to cover defects involving the hand. Designing a larger flap based on single vascular pedicle may increase the chances of distal flap necrosis and donor site complications. In this study we have used two pedicled flaps with robust independent blood supply as a combined flap to cover major defects of hand. The dissection of both the Groin flap and the SIEA flap is straightforward and can be easily performed. Inclusion of these two pedicles allows a larger flap to be raised safely to

cover large defects of hand without the risk of distal flap loss. In the present study, 6 pts had complete flap survival, 2 patients had partial flap necrosis which was managed with debridement and ssg. 3 patients had partial graft loss at the donor site which was regrafted. Donor site morbidity like hypertrophic scarring and Contour deformity of the abdomen is a disadvantage of this flap.

## CONCLUSION

This is a fairly easy flap to raise. The combined use of these two flaps can be considered as an alternative for coverage of large skin defects on the hand without microsurgical procedures with minimal donor site complications.

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