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Case Report:

Bilateral Combined Groin and Hypogastric Flap for Coverage of Extremely Huge Combined Hand, Forearm and Elbow Defects

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ABSTRACT

Huge upper limb defects poses difficulty due to its length and need of thin skin flaps allowing tendon gliding and durable coverage. Many reliable flaps have been described either pedicled local, regional, distant pedicled or free flaps. The lower abdominal flap based on the superficial circumflex iliac and superficial inferior epigastric vessels; branches of the superficial femoral systems on both sides that were divided sequentially from the abdomen due to its robust size to avoid vascular compromise of the flap. The flap survived completely with good adherence and coverage. The donor site was closed primarily with very minimal donor site morbidity. In conclusion; bilateral combined groin and hypogastric flap may be useful in extremely huge combined skin defects on the hand, forearm and the elbow with high reliability and safe.

Key Words: *Groin & hypogastric flap – Hand – Forearm – Elbow – Defects.*

INTRODUCTION

The functions of the hand and upper limb need supple and durable skin coverage to withstand the continuous pressure and friction caused by hand usage. Coverage of extremely huge hand, forearm and elbow defects posed a challenge as they may need multiple flaps to be inset simultaneously to cover the exposed bones and tendons to avoid their desiccation and necrosis and offer a gliding bed for tendons later on **[1,2]**. The reconstructive ladder is an important concept in wound management **[3]**. Many regional pedicled **[4-6]** and free flaps were used as a reliable coverage for hand and forearm defects, meanwhile in extremely huge defects few number of flaps were mentioned as anterolateral thigh flap **[7]**, muscle flaps as free latissimus **[8,9]**, pedicled abdominal and thoracic flaps **[10-12]**.

CASE REPORT

Coverage of huge upper limb defects spanning elbow, forearm and hand with a single uniform flap with reliable vascularity and minimal donor site morbidity from the lower abdomen was achieved by using bilateral hypogastric and groin combined flap. This flap is supplied by the superficial epigastric and superficial circumflex iliac vessels on both sides and being freed from the abdomen in three sequential stages. The flap was offered to a 34-male patient with post flame, full thickness burn extending along the ulnar side of the right hand, the forearm and the elbow with total occlusion of the ulnar artery just distal to the bifurcation of the brachial artery. Nearly full length of the ulna was exposed with volar flexor superficialis, and partially profundus tendons.

A huge flap was needed, and the microsurgical choices were few and not encouraging according to the ulnar artery occlusion and the need to extend the dissection beyond the zone of injury, that may necessitate a longer flap pedicle and more donor morbidity, so need for huge pedicled distant flap came to the surface. We first measured the skin defects after through debridement (43 X 10cms in maximum dimensions) Fig. (1). The flap design was done with transverse dimension 43cm and vertical dimension 10cm. The lateral quarters of the donor site were closed primarily in this stage (Fig. 2). The flap was inset onto the elbow, forearm and the hand (Fig. 3).

Negative pressure wound therapy was applied to increase the adherence of the flap to the raw area of the forearm and also to allow for fluids egress decreasing soaking. Sequential division to the feeding vessels began two weeks after flap inset. The first side to be divided was the right side to allow for more comfortable position by freeing the elbow. Right superficial circumflex iliac vessels were divided, and skin above was incised two weeks after flap inset, then one week later the right superficial inferior epigastric vessels

were divided. Another week after this, both the left superficial inferior epigastric and superficial circumflex iliac vessels were divided and the whole flap totally survived with no area of congestion nor ischemia. The abdomen donor site was closed primarily without the need for skin grafting leaving a low transverse scar. The late results of the flap is shown (Fig. 4).

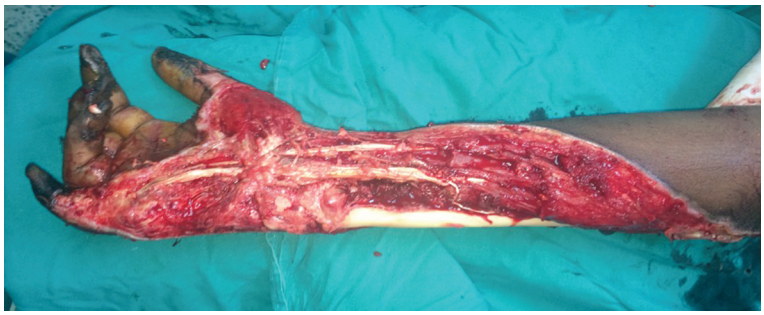

Fig. (1): Huge upper limb defect. Post burn raw area of the ulna side of the hand, forearm and the elbow in 34 years old male with exposure of nearly whole length of the ulna (43 X 10cms in maximum dimensions).

Fig. (2): Lower abdominal flap elevation. The lower abdominal flap elevated with transverse dimension of 43cm X 10cm in greatest dimensions.

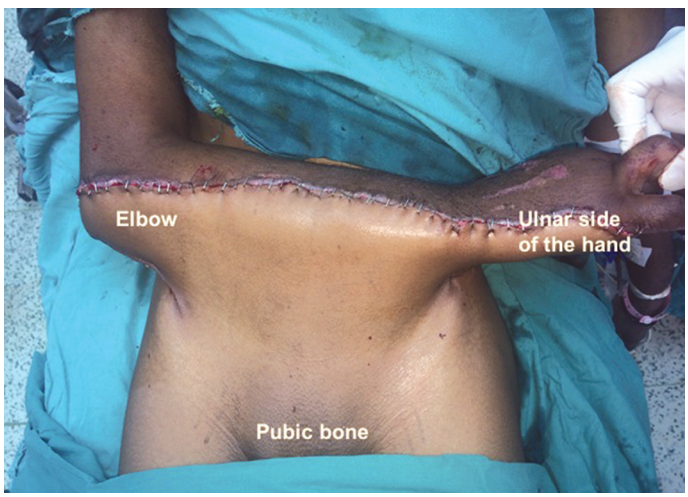

Fig. (3): Inset of the flap covering the defect sutured to the dorsal skin of the forearm and hand.

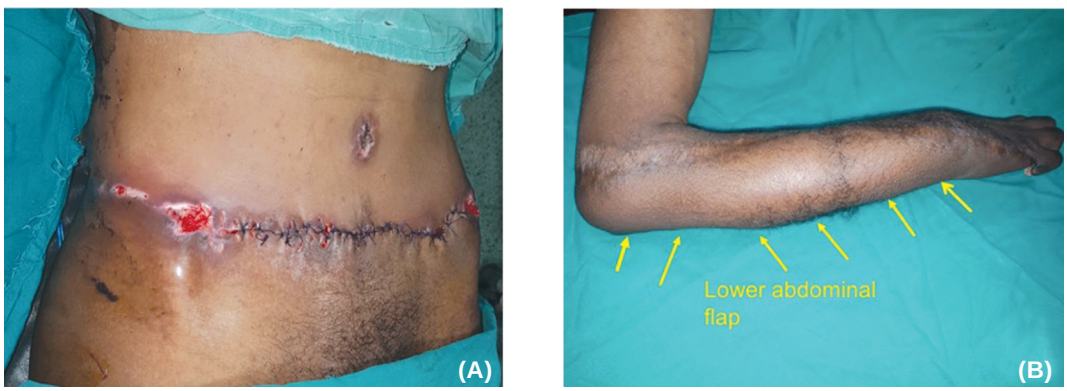

Fig. (4): Late post-operative flap photos. To the left, (A) The donor site closed primarily with good healing. To the right, (B) The flap healed with no vascular events with excellent skin match.

DISCUSSION

Coverage of huge upper limb defects poses a huge challenge to serve the delicate hand functions. Limited options for these huge defects are available as free flaps or distant pedicled flaps. Although the reliability of these options, huge defects may need two or three flaps with sequential operations, with the resultant morbidity of these flaps. The versality of groin flap in coversage of hand defects is well known, and also the hypogastric flap. Unilateral combined pedicled groin and hypogastric flaps was done for defects involving volar and dorsal hand defects **[13]**.

When dealing with huge defects in the upper limb we are in need to harvest one large flap that leads to better cosmetic outcome and un-interrupted lymphatic flow. The idea of using both flaps (groin and hypogastric flaps) bilaterally as a single continuous flap was not tried. Thus we tried to harvest one large continuous flap with huge dimensions about 43cms in length and ten cms in maximum width to serve cover the huge upper limb defect.

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