

## COVERAGE OF ELBOW INJURIES USING DOUBLE RANDOM FASCIOCUTANEOUS FLAPS AND SKIN GRAFT

\*Ozinko M.O., Otei O.O., Ekpo R.G.

Burns and Plastic Surgery Unit, Department of surgery, University of Calabar Teaching Hospital, Calabar, Nigeria.

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**\*Correspondence for  
Author**

**Dr. Ozinko M.O.**

Burns and Plastic Surgery  
Unit, Department of  
surgery, University of  
Calabar Teaching  
Hospital, Calabar, Nigeria.

### ABSTRACT

The aim of our article is to present the rarity of the use of double bi-pedicled transverse fasciocutaneous flaps for the coverage of elbow injuries. We present a surgical technique for the treatment of avulsion of the elbow in a young security officer following a gunshot injury. The reconstruction was done by using a double bi-pedicled transverse fasciocutaneous flaps and skin grafting the secondary defects in one stage. All the wounds healed satisfactorily and there was no significant edema to the right forearm and hand.

**KEYWORDS:** Bipedicle, Fasciocutaneous flap, Elbow injury, Skin graft.

### INTRODUCTION

The elbow lies at the junction between the forearm and the arm. A supple tissue is necessary for the normal function and aesthetics of the area. Loss of supple skin and subcutaneous tissue as well as the tendons and bones could lead to loss of function. Extensive wound with greater than fifty per cent of its circumference could lead to venous and lymphatic impairment, hence the formation of distal forearm and hand edema. Thus resurfacing of an avulsion injury of the elbow using tissues which can adequately restore skin and subcutaneous tissue is very important for functional and aesthetic recovery.

**CASE HISTORY AND MANAGEMENT**

**Figure 1. Elbow injury showing the musculocutaneous nerve of forearm (Before surgery)**



**Figure 2. Showing the proximal and distal flaps at the elbow with skin at the secondary defect (After surgery).**

This is a case of a 28 year old right handed male security officer (figure 1) in a company who was on duty when an unknown armed man forced his way into the company premises and shot him at the right elbow. He sustained a large right elbow avulsion injury. He bled profusely and was dizzy and restless but did not sustain any other injury. He was brought to the University of Calabar Teaching Hospital for treatment. In the accident and emergency

department, he was resuscitated with intravenous fluid, analgesics, antibiotics and anti tetanus prophylaxis before the plastic surgery team was invited to review and take over management. On examination, we found a fully conscious young man who was pale, restless and in painful distress. On upper limb examination, the left upper limb was normal. The right upper limb revealed antecubital injury measuring 10 x 8cm. This injury involved the skin and subcutaneous tissue and superficial fibres of the flexor muscles were avulsed. The median nerve was exposed and over hanging musculocutaneous nerve of the forearm was seen. He had tender, edematous forearm and hand. Capillary refill was two seconds with intact radial and ulnar vessels. There was loss of sensation on the median nerve distribution of the hand. Investigations included full blood count, urinalysis and plain X-ray of the elbow and there was no fracture.

### **SURGICAL TECHNIQUE**

The wound was debrided and alternate day wound dressing was done with normal saline and honey. Wound was clean and inflammatory edema resolved before reconstruction was embarked upon. Reconstruction was done in one stage by using double bi-pedicled transverse random fasciocutaneous flaps which were raised proximal and distal to the wound. The secondary defects were skin grafted. The skin graft was taken from the thigh. All wounds were dressed with sulfratule and bandaged. The wounds healed satisfactorily within three weeks (Figure 2).

### **DISCUSSION**

Soft tissue coverage of elbow wound has been problematic among the casualties of gunshot injuries. First, these wounds generally encompass a significant area surrounded by adjacent large zones of injury with compromised, though viable soft tissue. The principle of early surgical debridement of non viable tissue holds true for these gunshot injuries.<sup>[1]</sup>

Considerations for reconstruction of complex elbow wounds depend on the specific defect, patient demographics, donor site morbidity and medical center capabilities. Microsurgical expertise, equipment and time are pre-requisites for microsurgical free flap transfer.<sup>[2]</sup> The choice of double bipedicle transverse fasciocutaneous flap was based on patients choice of limiting all the wounds within the zone of injury in one staged surgery.

Several factors including the patient's age, sex, occupation and general health status before injury or an operation should be considered before choosing the method of wound closure.<sup>[3]</sup> The surgical procedure must be tailored to the needs of the wound and the patient.<sup>[1][4]</sup>

A variety of methods are useful in covering soft tissue loss about the elbow. These methods include random transposition fasciocutaneous flap, fasciocutaneous axial pattern and island flaps, muscle pedicle flap or the use of distant flaps such as thoraco-abdominal flap and latissimus dorsi flaps. The use of free flaps is not left out.<sup>[2][5]</sup>

Lamberty and Cormack.<sup>[4]</sup> described the antecubital fasciocutaneous flap both as a local transposition and a free flap. The radial forearm flap has also been used. Complex forearm and elbow injuries involve damage to the skin and underlying tissues. The best results were obtained when a multidisciplinary approach was taken to their management.<sup>[6]</sup> The wound was debrided within 24 hours the patient presented to the hospital and a second look was done on the 3<sup>rd</sup> day post injury. Definitive coverage of soft tissue defect in crush or avulsion injuries should be performed secondarily within 5 – 7 days since the extent of damage in this special form can only be judged after few days and the reconstruction of bones, vessels and tendons is completed.<sup>[7]</sup> The use of durable supple soft tissue cover to the elbow is very important due to its frequent stretching and relaxing of the skin.<sup>[5][7]</sup> The wound healed satisfactorily and no edema of the forearm and hand was noticed. The use of double transposition, random fasciocutaneous flap with split thickness skin graft for the secondary defect was a good option for the patient especially when the patient rejected the options of distant flap.

## CONCLUSION

Large elbow injuries are challenging to the reconstructive plastic surgeons and most importantly, when the patient rejects the options of distant flap and microsurgical expertise was lacking. The use of the double transverse random fasciocutaneous flap and the grafting of the secondary defects becomes an acceptable option.

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