ORIGINAL ARTICLE

Groin Flap for Coverage of Upper Extremity Defects in Enugu, Nigeria

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ABSTRACT

Background: *Extensive tissue loss of the hand has remained a big challenge to the Plastic and Reconstructive Surgeon. The objective of this study is to review the use of pedicle groin flap for coverage of distal forearm and hand defects in our centre, and to find out problems of using the flap and make suggestions for improvement.*

Method: *This is a retrospective study done using case records of patients treated with pedicle groin flaps for upper extremity defects at the National Orthopaedic Hospital Enugu from January 1999 to December 2004 (six year period) .Information on biodata, clinical presentation, treatment, complications and outcome was extracted and analyzed using descriptive statistics .*

Results: *Thirteen (13) patient's case files met the inclusion criteria and were analyzed. There were seven (7) males and six (6) females with mean age ranges between 9 years and 42 years. Four (4)had distal forearm and nine (9) hand wound coverage's . Flap survival was very good to excellent in all cases and the outcome quite satisfactory.*

Conclusion: *Use of pedicle groin flap for coverage of defects of the hand and distal forearm remains a very valuable treatment option in our environment.*

KEYWORDS: Groin; Pedicle flap; Upper extremity; Wound.

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INTRODUCTION

The upper extremity is the most commonly injured part of the human body with the hand being most often involved[1]. Extensive tissue loss of the hand has remained a big challenge to the Plastic and Reconstructive Surgeon[2]. The need for supple skin cover for optimal recovery of tendon function and joint movement often limits the choice for skin cover to regional and distant pedicle flaps, and free tissue transfers[1].

Since the renaissance of axial pattern flaps in the early 1970s, the groin flap which was first described by Wood in 1869 and rediscovered, named and popularized by McGregor and Jackson in 1972 has perhaps been the most widely used distant flap for resurfacing of the hand and forearm [3] . Its acceptable colour match, reliability and minor donor site morbidity have highly favored its use [1, 4]. The groin flap is based on the superficial circumflex iliac vessels. The artery is one of the inguinal branches of the femoral artery and runs laterally 2 to 3cm below and parallel to the inguinal ligament towards the anterior superior iliac spine. The flap is drained by a corresponding vein, which accompanies the artery in its proximal part, but becomes variable laterally, draining into the femoral vein [5, 6]. In the last 3 decades, with great development in microvascular facilities for free tissue transfer, many have recommended its use for distal upper extremity reconstruction in the form of a free flap [4,7] . Others described pedicle flap reconstructions as being only of historical interest [8]. In an environment like ours with limited facilities for microvascular free tissue transfers and inadequate supply of highly specialized facilities and manpower [9], the pedicle groin flap probably remains a very attractive option. Even in specialized centres, pedicle groin flaps can bail an experienced microsurgeon out in cases of free flap failures, or unfavourable vessels in the region of the defect [10]. The problems of this procedure have been stated to include the fact that it is associated with a prolonged period of hand immobilization, stiffness, pain, oedema, bulk, and discomfort to the patient.

In this study we present the results of treatment of thirteen consecutive patients in whom the groin flap was used to reconstruct diverse soft tissue defects of the hand and distal forearm.

PATIENTS AND METHODS

A retrospective study was carried out using case records of patients treated with pedicle groin flaps for upper extremity defects at the National Orthopaedic Hospital Enugu from January 1999 to December 2004. Various defects of the distal forearm and hand were treated using this flap over the six year period. All flaps were raised without prior Doppler assessment. Dissection was according to the guidelines described by McGregor and Soutar[11]. The flap lengths ranged from 6cm to17cm, and the widths from 5cm to 11cm. All donor sites were closed directly with tubularisation of the flap base.

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Flap division and inset was carried out under local anaesthesia in the second and third postoperative weeks, after flap training. The data was analyzed using descriptive statistics.

RESULTS

A total of 13 patients had pedicle groin flap reconstruction of various defects of the distal forearm and hand in the period under review. There were 7 males and 6 females.

The patients were aged 9 years to 42 years with a mean age of 28 years (Figure 1).

Reconstructed defects were post traumatic in nine patients and followed release of contracture in four.

Most reconstructions were for defects of the dorsum of the hand and distal forearm Table I.

The commonest complication was shoulder pain reported in all 13 patients followed by tip necrosis Table II.

However, in all enough tissues were still available for complete wound coverage.

Table I Reconstructed Sites

Site	Number	Percentage
Distal forearm	4	30.8
Dorsum of Hand	5	38.4
1st web space	2	15.4
Thumb	2	15.4
Multiple digit	2	15.4

Table II. Complication of Procedure

Complication	Number	Percentage
Shoulder pain	13	100
Oedema / stiffness of Hand	2	15
Wound infection	2	15
Tip necrosis	4	30

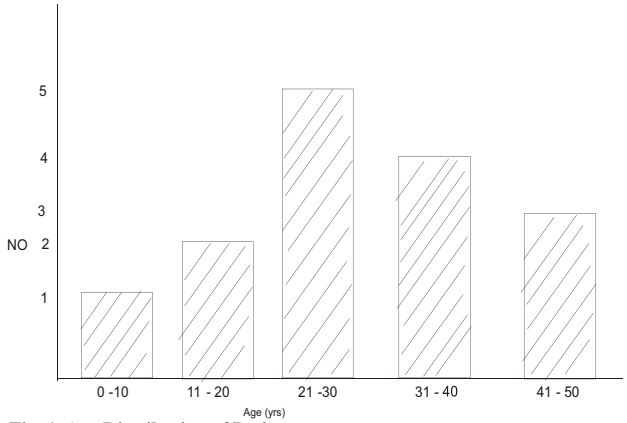

Fig. 1. Age Distribution of Patients

Fig. 2. Picture of Surgical Procedure

DISCUSSION

Injuries to the hand involving loss of skin and subcutis pose a big reconstructive challenge [2]. While skin grafting and local flaps may suffice for small to moderate wounds, large full thickness skin and subcutis loss requires supple skin cover for optimal tendon function and joint movement[1], as well as allowing for undermining in case of further surgeries.

The groin flap had probably found its major use in the resurfacing of the hand and distal forearm [12]. While microvascular free flap reconstruction has the advantages of earlier mobilization, fewer surgeries and reduced hospital stay [7]; it has the drawback of prolonged operating time [13], requires the presence of a satisfactory recipient vessel, extensive preoperative evaluation and proficiency with microvascular techniques [3, 9]. Although a single stage procedure, operating time has been shown in some studies to approximate the total operating time for the multistage pedicle groin flap reconstruction [7]. When one considers the fact that in the pedicle groin flap reconstruction, flap division and inset are commonly done under local anaethesia which is less risky, the actual anaesthetic risk may even be less in the multistage pedicle groin flap reconstruction than in the single stage microvascular procedure. Some authors have gone further to advocate the use of the pedicle groin flap as opposed to the microvascular free flap in reconstruction of soft tissue defects of the hand when both techniques will deliver equal results[14].

The diversity of defects treated in our series and other series [15], is a testimony to the versatility of these techniques. Even in patient with multiple digit reconstructions, we had satisfactory results. Some authors have also reported success in multiple digit reconstructions without syndactylisation [16].

Excessive tissue bulk has often been cited as a

major drawback of the groin flap for hand reconstructions [17], with some writers stating that they are invariably bulky[2]. Though bulky for digital reconstructions, they were of fairly acceptable thickness in most reconstructions of the forearm. When bulky however, debulking procedures were simple, safe and successfully done under local anaesthesia. Oedema and stiffness of the hand were noted in fifteen percent of our patients. Active exercises of the hand, with the relatively elevated position of the hand when lying supine, were fairly adequate in alleviating these complications. The commonest complication in this series was shoulder pain due to prolonged immobilization. With adequate preoperative counseling, post operative physical exercises and judicious use of analgesics our patients coped satisfactorily.

Flap survival was very good to excellent in all cases. This high survival rate is similar to reports from other series [18, 19]. Even with initial wound infection in two of our patients and tip necrosis in four, no flap loss was noted; further affirming the safety of this flap.

With direct closure and primary healing of all our donor sites and the concealed site of the scars, one can say that the donor site morbidity associated with this procedure is very minimal.

CONCLUSION

Pedicle groin flap reconstruction of distal upper extremity defects produced good result in our centre. It is a versatile and reliable technique with minimal complications thus making it a good choice for distal forearm and hand reconstructions.

In our environment with minimal facilities for microvascular free flap reconstruction, this technique becomes even more valuable and is recommended to the reconstructive surgeon practicing under similar circumstances.

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