

Groin Flap; A Simple and Versatile Option for Coverage of Hand Defects

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ABSTRACT

Objective: This study was conducted to share our experience of using groin flap for provision of soft tissue coverage to hand injuries.

Study Design: Descriptive Case Series study.

Place and Duration of Study: This study was conducted at the BVH Bahawalpur and CMH Bahawalpur from January 2014 to January 2020.

Materials and Methods: There are total 69 patients. Informed consent had been taken from all participants
Inclusion Criteria: Post-traumatic Upper limb defects of hand and forearm. Age 20 to 45 years. Patients who were vitally stable on admission and were presented after emergency optimization. Those patients who did not had any associated co-morbidity like diabetes mellitus, uncontrolled hypertension and smoking. Patients who gave consent for this operation and follow-ups

Exclusion Criteria: Upper limb defects of arm and proximal forearm; those cannot reach to groin comfortably. Age of more than 45 years. Unstable patients that require life/limb saving surgery first. Patients with co-morbidities like diabetes mellitus, uncontrolled hypertension and smoking. Patients not willing to participate.

Results: Out of total 69 patients 64(92.75%) were male and 5(7.25%) were female. The mean age was 21.34 years. The most common etiology was road traffic accidents, n=34(49.28%) followed by Household injuries, n=17(24.64%) Table I. The most common complication seen in our study was infection, 4(5.80%) Table II.

Conclusion: Groin Flap is a very versatile flap for coverage because of its supple skin and robust blood supply. However, the cost of donor site morbidity should be minimized for through proper planning and meticulous surgical technique.

Key Words: Groin Flap, Price to Pay, versatile.

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INTRODUCTION

The injuries of the upper limb are not uncommon in this industrial era. The anatomy of the hand is very complex and highly skilled functions are performed with hands and they pose unique challenges in reconstruction of the hand and upper limb injuries¹⁻³.

Like other wounds the main aim of the treatment is to achieve primary wound healing. the very basic requirements of the hand and upper limb injuries are; fixation of underlying fracture if any, repair of underlying structures, early supple soft tissue coverage, elevation and early exercises to avoid hand contractures⁴⁻⁵.

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Keeping in view the components involved and size of the wound, occupation of the patient, hand dominance and resources available the most feasible option is chosen from the reconstructive ladder; Primary closure, skin grafting, local flap, regional flap or free tissue transfer. In developing country like ours, the facility of free tissue transfer is available in limited areas. For provision of supple soft tissue coverage, the pedicled flaps like reverse radial forearm flap Posterior Inter-osseous Artery (PIA) flap and Groin flap are the preferred choices⁶⁻⁷⁻⁸⁻⁹.

The Groin flap is type Fascio-cutaneous flap based on superficial circumflex iliac artery¹⁰. Robust blood supply, supple skin, easy dissection and camouflage of the scar make this flap a favorable choice even in era of microsurgery and not letting it become out of fashion¹¹. This study was conducted to share our experience of using groin flap for provision of soft tissue coverage for hand injuries.

MATERIALS AND METHODS

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This study was carried out in BVH Bahawalpur and Combined Military hospital Bahawalpur from January 2014 to January 2020. In total 69 patients were enrolled for the study through sequential purposive sampling. All patients of hand or forearm treated with Groin Flap for soft tissue coverage were included in the study. However, patients having Diabetes Mellitus, smoking and metastatic cancer were excluded from the study as these maladies are associated with high risk of complications.

The enrolled patients were counseled in detail about the nature of injury, procedure to be performed, hospital stay and follow up visits. They were also informed about the risk of anesthesia and possible adverse complications of the surgery and revision procedures required. The effect is analyzed and flap is marked after reverse planning. The description of the flap, surgical technique is well described in the literature. The flap is raised in subcutaneous plane and inset according to requirement and hand is fixed for three weeks. The patients were discharged on 2nd or 3rd day and the pedicle was divided after three weeks and flap was inset. The further modifications like flap thinning were carried out after 2weeks of the second surgery. The patients were finally assessed at three months and all data was recorded on a specially designed Performa. Age, gender, etiology of injury, components involved and size of the defect, complications and number of revision procedures were the variables of the study. SPSS Ver24 was used to analyze and interpret the data.

RESULTS



Figure No.1:

Figure No.2:

Out of total 69 patients 64(92.75%) were male and 5(7.25%) were female. The mean age was 21.34 years. The most common etiology was road traffic accidents, n=34(49.28%) followed by Household injuries, n=17(24.64%) Table I. The most common complication seen in our study was infection, 4(5.80%) Table 2.

Table No.1: Etiology

Sr no	Etiology	n
1	Road Traffic Accident	34(49.28%)
2	Household Injuries	17(24.64%)
3	Industrial Accidents	9(13.04%)
4	Electric Current injuries	5(7.25%)
5	Hand Infections	2(2.90%)
6	Tumors of Hand	1(1.45%)
7	Human Bite	1(1.45%)

Table No.2: Complications

Sr no	Complications	n
1	Partial Flap Loss	1(1.45%)
2	Complete Flap Loss	nil
3	Infection	4(5.80%)
4	Hypertrophic scarring at Groin	1(1.45%)
5	Shoulder Stiffness	3(4.35%)
6	Hand Stiffness	2(2.90%)



Figure No.3:



Figure No.6:

DISCUSSION

The groin flap was first described by McGregor and Jackson¹² in 1972 and it has become a milestone in the history of plastic and reconstructive surgery for the provision of supple soft tissue coverage for a range of defects in upper limb injuries. It became a workhorse flap after that. It can be modified to provide tailor-made solutions for complex wounds.



Figure No.4:



Figure No.7:



Figure No.5:



Figure No.8:



Figure No.9:

The use Free tissue transfer in 1970¹³⁻¹⁴ has revolutionized the field of reconstruction. It offers single stage solution for reconstruction of complex defects anywhere in the body. However, it is technically demanding, time consuming and require specialized training and equipment. Furthermore, it may be contraindicated in patients with history of smoking, diabetes Mellitus or vascular disease. All these constraints do not let pedicled flap become obsolete and out of fashion. The pedicled flap like Groin flap can be used in these circumstances.

The groin flap¹⁰ has supple skin and robust blood supply. The scar can be camouflaged with under garments. The main disadvantages of the groin flap are; multistage procedure, hand in dependent position can worsen the edema and stiffness. However, excellent outcome results of this workhorse flap overshadow these disadvantages¹⁵.

In our study the majority of the patients were male 64(92.75%). The same pattern is seen in other studies. Jabaiti S, Ahmad M, AlRyalat SA⁹ conducted a study for

reconstruction of upper limb defects using pedicled abdominal flaps (Groin Flap) and reported that there were 91.2% male patients and 8.8% female patients. In their study the mean age was 22.2 years while in our study it was 21.34 years.

The main etiology in our study was road traffic accidents followed by industrial accidents (Table I). Choudry UH, Moran SL and Li S et al¹⁶ conducted a study on soft tissue coverage of elbow and reported 47% patients were secondary to trauma. Other main causes in their study were tumors (16%), infection (13%) and burn (6%).

The groin Flap is bulky in obese patients and some reconstructive surgeons have reported the use of thin flap for soft tissue coverage of injured tissues. Yamada N, Ui K, Uchinuma E¹⁷ reported a case series using thin groin flap with very satisfactory results. These modifications are helpful for the patients having excessive subcutaneous fat but can jeopardize the flap survival. The risk of compromising the vascularity of the flap should be kept in mind while de-fating it.

Keeping hand in dependent and fixed position can be inconvenient for the patient and it can lead to stiffness of the hand and other joints of the upper limb specialty shoulder¹⁸. Moreover, it can worsen the edema of the injured hand. However, it is well tolerated by most of the patients if they are properly counseled about the benefits of this robust flap and its usefulness in provision of supple skin coverage¹⁹. Stiffness of the shoulder and hand can be problematic in elder people or patients having comorbid like diabetes mellitus etc. in a study conducted by Graf and Beemer²⁰ on this topic reported stiffness of the shoulder joint in 17% patients above 50 years of age bracket while Jabaiti S, Ahmad M, AlRyalat SA⁹ reported shoulder stiffness only in 2.94% patients of same age group. This diversity reflects wide variation among the patients and study centers.

Flap necrosis is a nightmare for every reconstructive surgeon. It can increase the financial cost, delayed return to work and additional procedures. Every effort is made for flap survival and better outcome. Fortunately there was no complete flap necrosis in any patient in our study. Partial flap was noted in 1(1.45%) patients. Wang et al²¹ reported partial flap loss in one patient (11.11%) while Urushidate et al²² reported zero flap loss in their study. These variations can be due different sample size and different level of surgical expertise and overall health care facility. This flap remains an important tool in armamentarium of plastic and reconstructive surgeon even in era of microsurgery. Although a lot of studies have been carried out on this topic but there is always a room for improvement.

CONCLUSION

Groin Flap is a very versatile flap for coverage because of its supple skin and robust blood supply. However, the cost of donor site morbidity should be minimized for

through proper planning and meticulous surgical technique.

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Author's Contribution:

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 Drafting: Ghazanfar Ali, Tahir Iqbal Mirza
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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