



RETROSPECTIVE ANALYSIS OF HAND INJURY PATIENTS TREATED WITH PEDICLED GROIN FLAP RECONSTRUCTION

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Abstract

Background: A pedicled groin flap has a vital role in reconstructive hand surgery. This flap is not only a safe method for closing the defect of soft tissue loss of the hand but is also used in many clinical conditions.

Aim: The main purpose of this study is to evaluate the epidemiology and geographic aspects of the patients who require treatment with a pedicled groin flap. Pedicled abdominal and groin flaps have been used for hands and forearms reconstruction for years. We studied 40 patients that have undergone the treatment with groin flap reconstruction of hand injuries at Sri Krishna Medical College and Hospital. The age groups of these 40 patients were 7-56 years.

Methods: Out of 40 cases, the defect in 20 cases is caused mainly by burn. In the rest of the cases the etiology is different.

Results: In 20 cases immediate flap surgery is done because of the exposure of critical structure. 98% of the cases were successful.

Conclusion: Pedicled groin surgery is a safe and easy method which has promising results. It is a good choice for hands and forearm defects.

Keywords: Pedicled groin flap, Reconstruction, Hand defect

Introduction

Upper extremity soft tissue reconstruction is an extensive topic as a multitude of options exist for diverse soft tissue defects involves shoulder, arm, forearm, elbow and hand. The main highlight in the venture of reconstruction of soft tissue defects of hands was the explanation by McGregor and Jackson of McGregor's pedicled groin flap [1]. The subsequent introduction of microsurgical free

flaps enormously extended the reconstructive capability, to the extent that the option of a pedicled flap to cover the soft tissue defects in the hand was often relegated to the background [1]. There are other flaps like free and local flaps used for hand, but groin flaps are still used widely. The main benefit of the free flaps is a single procedure, and the patient is admitted to the hospital for fewer days, decreasing the patient's discomfort. Microsurgery has taken on an important role in the reconstructive arsenal from many perspectives. On the other hand, free flap is also used for the reconstruction of other critical structures but needs more resources, the patient has to be admitted to the hospital for a long time and can cause flap loss. With the help of microscopes in surgeries and the increase in microsurgical experience, free flaps become the first choice.

In many countries around the world practicing microsurgery is not common due to lack of experience, lack of training and unavailability of microsurgical equipments. Whereas the countries commonly practicing microsurgery sometimes cannot perform the surgery because of the patient's condition. In both the condition pedicle flap is the only option left for the hand surgical team.

In many countries, hand injuries are very common with different levels of severity level, which may require plastic surgery. In these cases, because of the loss of a lot of tissue, it required a large number of soft tissues to cover the lesion which is not achieved by free flaps. Instead of which regional distant flaps are used.

The aim of the study was to know the severity and injury mechanism most of which were caused by degloving of parts like tendons and bones. In all of these cases, a groin flap is performed.

Methods

The main motive of this study was to assess the outcome of the patients whose hand tissue defects were covered by pedicled groin flap after star contracture release at the Sri Krishna Medical College and Hospital. The basis of incorporation includes patients with acute trauma. The patient has undergone surgery in hands for pedicled flap for important parts like tendons, bones, and neurovascular structure. The first step includes radical debridement of the wound and then the second stage is performed after around 20-36 hrs. Neurovascular structures are vital in those cases, we go for immediate flap cover. Patients are categorized based on where the soft tissue defect is present in the body. Criteria like age, sex, etiology, and flap performed were examined.

The study included twenty-four male patients and sixteen female patients with an average age of 31 years (7-56 years). 12 patients that is 60% of the defect was caused by the burn, 4 patients or 20% by crash, tumor 5%, infection 5%, degloving injury 5%, snake bite 5%.

Surgical planning:

Firstly, the wound was cleaned and made ready for closure. After flap placement pedicle compression and traction are avoided. Stitching is done to secure the extremity with the trunk and wrapped with bandages. With the help of the bowel clamp pedicle compression started within 2 weeks. If a pedicled flap is harvested, dissection is begun on the lateral aspect than the medial aspect.

Results

The mean value of the flap was 109.55 cm (5-13 cm width and 7-13 cm length). The time taken to operate varies from 2hr-to-2hr 30 mins. Overall hospitalization days were 34 days. After the operation, the mean follow-up time was 3 months. All the patients have a history of trauma which includes road accidents, work-related injuries, and blast injuries. Resurfacing acute traumatic defects, implant exposure after orthopedic intervention in patients, and resurfacing unstable scars in patients' flaps were used. In 20 patients (50%) immediate pedicle flap was done because of the exposure of the critical structure. Latissimus dorsi myocutaneous was performed on three patients for soft tissue coverage and elbow flexion. 98% of the cases were successful. The only complication we faced was flap necrosis. Antibiotics were prescribed to the patients for the management of infection as per their sensitivity. Those patients who have total flap necrosis have to go through

another pedicled. Neither stiffness of the elbow nor hand is seen because of the immobilization for three weeks. The wound-healing process was smooth for the patients.

Follow-ups

After the patient gets discharged from the hospital, a checkup is done after a day postoperatively. After that 1-4 months and 4-5 months' time intervals. The follow up mainly includes flaps checkup, flap examination with needle ticked and dressing.

Case 1

In this case, a woman of 20 years old has burn scar contracture on both the elbows and hands because of a gasoline burn during her work in 2017 in Sri Krishna Medical College and Hospital. The treatment lasted for 2 months. On examination, the findings were scars on the face and right ear, both elbows and hands with burn scar contracture. On examination what we found was hypertrophic scars on both the arms and legs, scar on the face a left ear, burn scar contracture on both hands and elbows.

We carried out a pedicled groin flap to cover the lesion right after the burn scar contracture was released in the hand. After 1 month pedicled division was done. The flap was sustained and restored well. For better functioning of fingers and joints, physiotherapy sessions were taken. The patient followed up for 4 months.

Case 2

Women of 21-year-old old came with a mass in her right wrist which was increasing in size quickly and was very painful. An excisional biopsy was carried out for the diagnosis. It was diagnosed as a giant cell tumor of distal radius. After the removal of the tumor pedicled groin flap was carried out to cover the lesion. The was not successful as there was insufficient blood supply and infection. After the flap removal, the wound was covered with a fibular-free flap. The fibular flap did not survive because of the long duration of anastomosis and venous congestion. The flap was removed afterward, and amputation was carried out.

Discussion

Regardless of an increasing number of free and local flaps used for repairing hand defects, groin flaps are still used broadly. The main motive of this study is to assess the outcome of the patients whose hand tissue defects were covered by pedicled groin flap after star contracture release at the 'ABC' center for 10 years. The upper limb is one of the tricky units on which this flap can rely. Free flaps are rarely done on the upper limb. As it is a retrospective study, we have no comparative group and we have not measured the functional outcome. Most of the patients required additional debulking as they have bulky soft tissue mass. The outcomes of many patients were quite good. About the etiology, the main cause in our study is burn which is 12 cases or 60%.

Pedicled groin and abdominal flap indications:

1. Complex hand injuries in children below 2 years of age.
2. Degloving injuries of fingers.
3. Multiple defects in fingers, arms, and forearms.
4. To preserve length in multiple finger amputation.

Study	Country	Study Period	Frequency	Male	Female	Sex Ratio
Yuce S [3]	Turkey	2010-2014	40	65%	35%	1.9
Amouzou Ks [4]	Morocco	2013-2015	10	60%	40%	1.6
Ghosh Jc[5]	Bangladesh	2000-2001	34	94%	6%	15.6
Goertz O[2]	Germany Cambodia	2009-2012	85	80%	20%	4.1
Our Series	India	-	40	60%	40%	1.5

The patients with electric burns were admitted to the hospital for a longer period than the patients with other causes. The long hospitalization time, set down to the morbidity of electric burns. During the procedure of abdominal and thoracic flap vascular anatomy and comfort should be taken care of. A narrow base and long pedicle flaps help keep the patient in more comfort. It is mandatory to close the flap donor site. Sometimes the groin flaps are larger than 13 cm and abdominal flaps cannot be closed primarily in that case grafting is done. To protect from graft scarring expander can be used or an expander can also be used in obese patients. Shoulder Stiffness may occur in old patients because of the prolonged immobilization. However, we did not encounter this problem in our patients. Wound dehiscence is the only minor complication that occurs in the donor site.

Following advantages explain their wide use:

1. Good vascular supply that enhances the viability of surrounding tissue around the flap [6].
2. Vascular reliability even when anatomic variation exists [7-9].
3. Simple procedure that can be carried out by less experienced surgeons and short operative time [10]
4. It can be used in emergency cases because of the quickness of the procedure and the large surface area of the flap [2, 9, 11]
5. Secondary division and inset procedure can be performed in a short outpatient procedure [10]

Contraindications are anatomical malformation, previous groin surgery, cancer, radiotherapy in the groin area.

Conclusion

Hand soft tissue injuries are very common in Bihar. It causes soft tissue loss and hand scar contracture which leaves the victim handicapped. A common cause of the injury is burns. It is more common in young people. Groin flap has promised results and a simple technique. Pedicled groin flaps are safe and easy surgery. As the flaps are easy and safe it is a good choice for hand and forearm defects.

A pedicled groin flap is the first choice for the reconstruction of the hand defect surgery. This is the most authentic way of closing the defect in hand. The only drawbacks are patient is hospitalized for a longer period, it contains multiple procedures, and fixing of the hand to the groin region.

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