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Research Article

CONSEQUENCE OF FASCIOCUTANEOUS FLAPS IN 100 CASES WITH EXPOSED BONES OF LOWER LEGS

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Abstract:

Objective: To evaluate the outcome of fasciocutaneous flaps in 100 cases having exposed bones in lower leg.

Methodology: This cross sectional study was conducted at the Department of Plastic Surgery & Orthopaedic Surgery, LUMHS Jamshoro with the 3 years duration august 2011 to September 2014. All the patients with all age groups either gender having uncomplicated or complex defects concerning legs due to any factor were selected for study. All the cases with chronic osteomyelitis including diabetic mellitus were excluded from the study. After taking complete medical history, physical examination, routine laboratory investigation and radiography all the patients were underwent reconstruction using different fasciocutaneous flaps. Flaps result was recorded as per partial or complete flap necrosis as well as valuable handling of the receiver's defect and outcome was recorded in the Performa.

RESULTS: Majority of patients i.e 43(43%) belong to age group of 31-45. 91(91%) were male while 09(9%) were female. According to etiology, most common reason was RTA in 85(85%). Most common type of flap used was sural flap in 28(28%) patients followed by posterior calf flap in 13(13%) patients, lateral fasciocutaneous flap 14(14%), double fasciocutaneous flap 10(10%), medial fasciocutaneous flap 9(9%) , retrograde peroneal flap in 9(9%) , malleolar flap 07(7%) . while primary closure was done in 02(2%) patients. According to the outcome partial flap necrosis was found in 6% patients followed by partial skin loss 4% patients and complete flap necrosis was only in 1 cases.

CONCLUSION: Fasciocutaneous flap can cover exposed bone at any site of lower legs; retrograde sural flap is perfect to cover exposed bones especially of foot and ankle joint.

Key words: Outcome, Fasciocutaneous Flapes, Lower Leg Defects

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INTRODUCTION:

Administration of soft tissue around the lower regions of feet and legs have a substantial challenging stipulation for reconstructive surgery specialist due to the defects of composite tissue, poor circulation and insufficient as well as stiff local tissues.¹ Tendon bones are often unprotected on account of the narrowness of subcutaneous tissues, turning skin implanting to have a poor alternative.² A lasting flap having persistent vascularity, suitable skin texture, reliable rotational arc, dissection comfort as well as least donor region morbidity are the best preferred choices for handling such defects.^{3,4} Various local flaps concerning defects of hind foot including flap of dorsalis pedis artery, abductor muscle flaps of digiti minimi and hallucis, have insufficient tissue in addition to an inadequate rotational arc thus limiting their recurrent application. Flap of medial planter artery has been a best choice in cases of weight tolerating heel however its contribution in injury often prevents its application.⁵ Numerous current publications have demonstrated acceptance of flaps of lateral supramalleolar & superficial sural artery in order to handle defects regarding ankle & foot. These flaps may be upgraded effortlessly as well as replaced for the flaps of microsurgery of ankle & foot reconstruction and distal lower leg in certain conditions. There are benefits of these flaps to a certain extents of rotation, easy & quick raise, persistent vascularity and satisfactory donor-site morbidity. Though, a few complications are accounted, like partial flap & flap congestion failure due to insufficient venous return, whole flap failure due to rotation or compression of thick & wide adipofascial pedicle beneath subcutaneous tunnel, in addition to donor region morbidity.^{6,7} Baumeister et al⁸ established a general complication frequency of nearly 59% in an accurate analysis of seventy flaps, which comprise a wide patient group without & with comorbidities. The other reconstructive procedures for dorsal surface of the foot & ankle defects are flaps of without microsurgery. The transfer of microsurgical free flaps may escalate the supply of blood to united regions and offer handling of exposed crucial tissues at a stage.⁹⁻¹¹ Free thoracodorsal artery perforator flaps are capable of resurfacing defects concerning any size as well as offer various forms of tissue to reconstruct composite defects. There are a few reports demonstrating the free thoracodorsal artery perforator flaps flap for reconstruction of dorsal surface of foot defects in literatures.^{12,13} Therefore this study has been conducted to evaluate the e the outcome of fasciocutaneous flaps in cases having exposed bones of lower legs at tertiary care hospital.

MATERIAL AND METHODS:

This cross sectional study was held at Plastic Surgery and Orthopaedic Surgery Department of LUHMS Jamshoro with the 3 years duration august 2011 to September 2014. All the patients with all age groups either gender having uncomplicated or complex defect concerning leg due to any reason were selected in this study. All the cases with chronic osteomyelitis, chronic liver disease, thrombocytopenia, altered PT, APTT and diabetes were excluded from the study. After taking complete medical history, physical examination, routine laboratory investigation and radiography all the patients were underwent reconstruction using different fasciocutaneous flaps. After surgery postoperative time the flap was observed for any pallor or venous congestion. Flaps result was recorded as per partial or complete flap necrosis, successful handling of receiver defect, easy or trouble in wearing shoes or walking, ambulatory condition of traumatic limb. All the information regarding age, gender, etiology, types of flaps, site of injury and outcome was recorded in the Performa and analyzed in SPSS version 16.0.

RESULTS:

Majority of patients i.e 43(43%) belong to age group of 31-45 . while 17(17%) patients were above 60 years. 32(32%) patients belonged to age group of 40-60 years and 08 (8%) patients were in age group of 15-30 years. Regarding gender of participants, 91(91%) were male while 09(9%) were female. According to etiology, most common reason was road traffic accident in 85(85%) patients followed by electric wound in 11%, fight 2%, others 02(2%).

TABLE:1.

Most common type of flap used was sural flap seen in 28(28%) patients followed by posterior calf flap was used in 13(13%) patients, lateral fasciocutaneous flap 14(14%), double fasciocutaneous flap 10(10%), medial fasciocutaneous flap 9(9%) , retrograde peroneal flap 9(9%) , malleolar flap 07(7%) . while primary closure was done in 02(2%) patients.

TABLE:2.

Most common bone involved was heel and ankle seen in 28(28%) patients followed by upper 1/3rd of leg seen in 14(14%) patients, tendo-cacaneous in 12(12%) patients , dorsum of foot seen in 11(11%) patients ,upper 1/3rd and lower 1/3rd of leg was involved in 10(10%) patients, middle 1/3rd of leg seen in 09(9%) patients, middle 2/3rd of leg seen in 08(8%) patients. Knee joint was involved in 04(4%) patients. **TABLE: 3.**

**Table 1: Demographic Characteristics of patients
(N=100)**

Variables	Frequency	Percent
Age		
1-30years	08	08%
31-45years	43	43%
46-60 years	32	32%
60 above	17	17%
Gender		
Male	91	91%
Female	09	09%
Etiology		
Traumatic wounds	85	85%
Electric wounds	11	11%
Dog bite	02	02%
Other	02	02%

Table 2: Types of flap (N=100)

Types of flaps	Frequency	%
SURAL FLAP	28	28%
POSTERIOR CALF FLAP	13	13%
LATERAL FASCIO CUT: FLAP	14	14%
MEDIAL FASCIO CUT: FLAP	09	09%
DOUBLE FASCIO CUT: FLAP	10	10%
RETRO GADE PERONEAL FLAP	09	09%
RETROGRADE SUPRA MALLEOLAR FLAP	07	07%
PRIMARY CLOSURE	02	02%

**TABLE 3: SITE OF THE BONES
(N=100)**

Bone site	Frequency	Percent
HEEL and ANKLE	28	28%
UPPER 1/3 leg	14	14%
LOWER 1/3 leg	03	03%
MIDDLE 1/3 leg	09	09%
MIDDLE 2/3 leg	08	08%
DORSUM OF FOOT	11	11%
KNEE JOINT	04	04%
TENDO CACANEOSUS	12	12%
UPPER 1/3 & LOWER 1/3 leg	10	10%

Table 4: Outcome of flap (N=100)

Outcome	Frequency	Percent
COPLETE FLAP NECROSIS	01	01%
PARTIAL SKIN LOSS	04	04%
PARTIAL FLAP NECROSIS	06	06%

DISCUSSION:

Compound trauma of the lower limbs needs to be covered by different flaps. This type of trauma most common affected were 2nd, 3rd and 4th age groups males those who moving around actively to bread win for the families.¹⁴ Though in this series majority of patients i.e 43(43%) belong to age group of 31-45 . while 17(17%) patients were above 60 years. 32(32%) patients belonged to age group of 40-60 years and 08 (8%) patients were in age group of 15-30 years. Regarding gender of participants, 91(91%) were male while 09(9%) were female. Similarly Ajmal S et al¹⁵ reported that 20(80%) cases were men whereas 5(20%) were women. Their age varied through 2-60 years, with 25 years of mean age. Franken JM et al¹⁶ reported that the male gender was most represented as; out of total cases 39 were male and 13 were female, mean age was 44.5 years with range of minimum 15 years and maximum 79 years. Suliman MT et al¹⁷ also found comparable results as 75% were male and 25% were female. We found most common reason was traumatic wound seen in 85(85%) patients followed by electric wound 11(11%), dog bite 02(2%), others 02(2%). Comparable results were found in study of Ajmal S et al¹⁵. In this study most common type of flap used was sural flap seen in 28(28%) patients followed by posterior calf flap seen in 13(13%) patients, lateral fasciocutaneous flap 14(14%), double fasciocutaneous flap 10(10%), medial fasciocutaneous flap 9(9%), retrograde peroneal flap 9(9%) , malleolar flap 07(7%). while primary closure was done in 02(2%) patients. Kumar Met al¹⁸ reported that the reconstructive method applied comprises the various faciocutaneous flaps applied comprises lateral fasciocutaneous flap, posterior calf flap, sural flap, double fasciocutaneous flap, medial fasciocutaneous flap, retrograde peroneal as well as retrograde supramalleolar. On other hand Suliman MT et al¹⁷ reported that peroneal artery perforator flap used in 75% patients, superficial sural artery flap used in 17%, while posterior tibial artery perforator flap used only in 1 case.

In this series most common bone involved was heel and ankle seen in 28(28%) patients followed by upper 1/3rd of leg seen in 14(14%) patients, tendo

cacaneous in 12(12%) patients , dorsum of foot seen in 11(11%) patients ,upper 1/3rd and lower 1/3rd of leg was involved in 10(10%) patients, middle 1/3rd of leg seen in 09(9%) patients, middle 2/3rd of leg seen in 08(8%) patients. Knee joint was involved in 04(4%) patients. As well as Debbarma S et al¹⁹ stated that right leg was the predominant lower limb involved with incidence of 73.33% within group-I in addition to 60% within group II. Middle one third of the leg being the common site of the soft-tissue defect in both groups 66.7% and 60% in group I and group II respectively. Ajmal S et al¹⁵ reported that the defective site was distal 3rd of leg among 9 (36%) cases, lateral malleolus among 3 (12%), heel among 9 (36%), and 2 (8%) each for dorsum of foot as well as unprotected achilles tendon.

In this study complete survival flaps were noted 89%, while partial flap necrosis seen in 06(6%) patients followed by partial skin loss seen in 04(4%) patients and complete flap necrosis seen in 01(1%) patients. Ajmal S et al¹⁵ reported that flap persistence among 80% of our cases, incomplete flap loss among 8%, marginal necrosis among 8% in addition to complete loss among 4%. A meta-analysis of 50 articles accounting the application of 720 distally established sural flaps, proposed 82% flap success rate. Follmar KE et al²⁰ mentioned that whole flap necrosis was accounted among 3.3%, in addition to marginal or partial flap necrosis among 11%. Likewise, a comprehensive retrospective study of Baumeister SP et al²¹ reported that complication rate of sural flap was freshly carried out on a succession of 70 successive flaps. The complication rate accounted was 59% (41/70 flaps), incomplete necrosis was recorded among 17% in addition to full necrosis among 19% flaps.²¹ On other hand Akhtar et al² in his finding also mentioned that 84 cases experienced flap survival among 78.5%, incomplete necrosis among 16.5% in addition to full necrosis among 9.5%. In another study of Chittoria R et al²² stated that Fasciocutaneous flaps provide the stable wound coverage in 20 cases having leg wound defects, in two cases infection seen, 2 noted with partial graft loss, while only one cases had partial flap necrosis

CONCLUSION:

We concluded that by fasciocutaneous flaps we can cover exposed bone at any site of lower legs. Retrograde flap is ideal to cover exposed heel, dorsum and the sole of foot and ankle joint. More studies are required to strong experience regarding flaps to cover exposed bones.

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