ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 6, Issue – 5, October – 2021 , Page No. : 48 - 51

Sequential therapy of debridement, vacuum sealing drainage and latissimus dorsi free-flap reconstruction for extensive soft-tissue injury with multiple fractures of left foot

[1]Dr. Murakonda Sowmya Chowdary, [2]Dr. Deepak Hongaiah , [3]Dr. Krishna Prasad K

[1-3]Department of Plastic Surgery, R L Jalappa Hospital, Kolar.

Corresponding Author: Dr. Murakonda Sowmya Chowdary, Department of Plastic Surgery, R L Jalappa Hospital, Kolar.

Citation this Article: Dr. Murakonda Sowmya Chowdary, Dr. Deepak Hongaiah, Dr. Krishna Prasad K, "Sequential therapy of debridement, vacuum sealing drainage and latissimus dorsi free-flap reconstruction for extensive soft-tissue injury with multiple fractures of left foot", IJMSIR- October - 2021, Vol – 6, Issue - 5, P. No. 48 – 51.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Foot injuries are common .The usual mode of injuries are road traffic accidents, fall of heavy object, crushing between moving objects etc. They often result in complex tissue loss with exposed bones and tendons requiring reconstruction aimed at restoring form and function. The stress and strain of weight bearing, ambulation, activities of daily living, and occupation have to be considered while planning. These three-dimensional defects ideally require flexible well-perfused flaps to fill the space, afford resistance to infections, and to provide supple, durable weight- and pressure-bearing surfaces. Microsurgical free muscle flaps with split thickness skin graft cover have been found to have several advantages in covering such defects.[1] Skin grafted muscle flaps are the first choice for post-traumatic defects of the foot and leg [2]. Modern protocols for limb salvage surgery in combat injuries have included early flap covers to limit the number and extent of amputations.[3,4]

Keywords: Foot, Skin graft, LEMR, Microsurgical

Introduction

The evolution of microvascular surgery have gained the ability to manage a variety of extensive soft tissue defects resulting from major trauma Various flaps have been devised for soft tissue coverage, including myocutaneous, fasciocutaneous and free muscle flaps. Under most circumstances of large soft tissue defects, there also exists severe bone defects as well, such as in trauma. The successful management of most of these soft tissue injuries therefore needs sequential therapy like treatment of the underlying bony defect followed by free flap reconstruction and split thickness skin graft. In this regard, the successful application of these flaps in the treatment of soft tissue and underlying osseous tissue defects, involves the convergence of various techniques and multiple surgical interventions. Although the forearm flap has been one of the most frequently used flaps, its use has progressively diminished in favour of the latissimus dorsi myocutaneous or muscle flap. Goals of lower extremity microvascular reconstruction (LEMR) include the

restoration of function, prevention of infection, and optimal cosmesis which favours more for latissimus dorsi myocutaneous flap with relatively few drawbacks.[5]

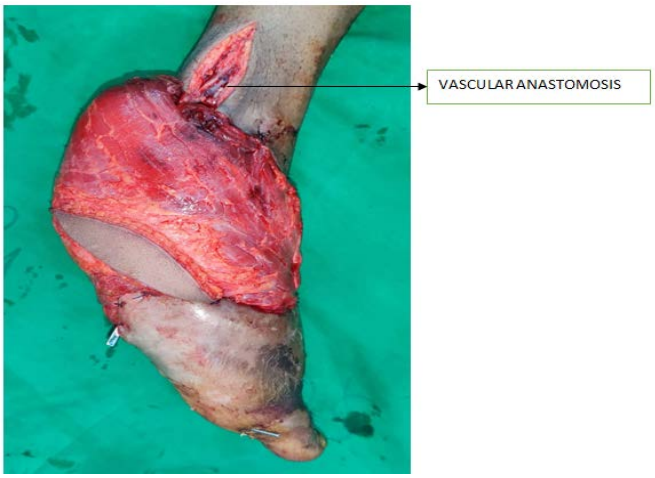
Case Report

A 42 year-old male presented to our emergency department with alleged history of RTA following which he sustained multiple lacerated wounds circumferentially around ankle , mid foot with avulsion of heel pad resulting in exposure of underlying tendons and bones with moderate contamination with grass and sand particles . Range of movements restricted.

Through wound wash was given and wound was explored in emergency department and regular dressings were done followed by Wound debridement + Multiple K-wire fixation for left tarsal bone fractures + VAC dressing application .

Post-operative period was uneventful, on POD2 wound inspection and dressing was done followed by daily VAC dressings for period of 7 days followed by Wound debridement + Latissimus dorsi free flap reconstruction.

Latissimus dorsi flap



Dressing is kept unopened and on POD3 Split skin grafting was done for raw wound over left foot .

Post-operative period was uneventful, on POD 2 wound was inspected

Regular dressings were done under sterile conditions. Patient improved symptomatically and hence discharged on POD 15.

Anterior aspect (left) and medial aspect (right) showing excellent healing 6 months post-operatively. A latissimus dorsi muscle flap with a split thickness skin graft was used to cover the defect.

Flap site wound healed by primary intention.

Discussion

Free flaps constitute the most common form of free tissue transfer used in microsurgery today. Free flap transfer can be used as an emergency reconstruction or as a secondary procedure to cover soft tissue defects in both the upper and lower extremities. The latissimus dorsi has been making a solid place in the microsurgeon's armamentarium and its advantages are multiple: it is a large and versatile flap that can be tailored to meet the needs accurately. Donor site morbidity is minimal even after the entire muscle is removed, particularly if the skin is left intact. The latissimus dorsi can be used as a myocutaneous or muscle flap. However, it appears that the need for using both skin and muscle is now diminishing because of the superior cosmetic results achieved with split thickness skin grafts. Even specialized areas such as the plantar surface of the foot can have excellent results with a muscle flap and split thickness skin graft. The results suggest that the use of a muscle flap in lower extremities which are compromised due to severe trauma is effective and beneficial results appear to be the result of covering these defects with healthy tissue which has a large blood supply.[6]

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