



Limb salvage in high-risk diabetic foot infection utilizing external fixation for wound and flap offloading

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Statement of Purpose

High-risk diabetic foot infections (Wagner grade 3 and 4) with large soft tissue deficits are challenging for wound care physicians to heal. This case series evaluates limb salvage and wound healing rates of patients with diabetic foot infections that were deemed high-risk by the study authors. Because of their high-risk nature, muscle flap and wound offloading with external fixation was utilized.

Introduction

Lower extremity wounds are among the most challenging wounds with respect to healing. Most patients with lower extremity wounds have comorbidities such as diabetes mellitus and peripheral vascular disease, both of which make the healing process even more difficult.

Large soft tissue defect on the foot often results in exposed tendons and bones and makes skin grafting more difficult. A small number of studies have been done using the peroneus brevis muscle flap to successfully cover ankle and distal leg wounds, this technique also increased vascularity to the area and help to treated infectious.

External fixation prevents the muscle flap mobility, which causes failure in flap success. External fixation also provides stability to the bone and surrounding soft tissue, as well as advanced wound care technique.

Procedures

Case Study: 47 patients with high-risk diabetic foot infections (Wagner grade 3 and 4) were included in this study. Wound healing and limb salvage rates were recorded. Rotational muscle flap and wound offloading was utilized in 47 consecutive patients with high-risk diabetic foot infections. Muscle flaps included 22 peroneus brevis, 14 abductor hallucis and 11 abductor digiti minimi quinti and were based on location of the primary wound. Ilizarov External fixation was then utilized to offload the flap and wound. Non weight bearing was recommended for all the patients in the study.



Results

Muscle Flaps

Muscle Flap	Percentage
Peroneus Brevis	22%
Abductor hallucis	14%
Abductor digiti minimi quinti	11%

Conclusion

With this technique, 43 out of 47 wounds were healed. Limb salvage was 45/47 for a 95% limb salvage rate. 12 patients had recurrence of their wound throughout the follow up period all of which healed with local wound care. There were no flap failures through the entire study period. Ilizarov external fixation can be effectively utilized to offload diabetic foot ulcers and to protect and offload rotational muscle flaps safely and with high limb salvage rates. Within this study, no pin track infections were noted.