



Introduction

The application of the reverse sural artery flap in soft tissue reconstruction of the heel is becoming increasingly more commonplace in the podiatric surgery realm. Known to be useful for covering defects of the lower third of the leg, ankle and hindfoot, this case specifically looks at its implication in the coverage of a chronic Wagner grade 4 heel ulcer in a patient with chronic calcaneal osteomyelitis. We report on the clinical result of proceeding with flap coverage in a patient with a less than optimal health condition as an alternative to more proximal amputation.

Methods

Pre-operative Doppler assessment was performed to mark out the peroneal perforators with the distal most located at 5 cm proximal to tip of lateral malleolus. During the first procedure, complete surgical debridement of all necrotic and non-viable soft tissue and bone including part of posterior calcaneus was performed down to healthy bleeding tissue. A fasciocutaneous paddle was incised down to the level of deep fascia. Two large perforators and any surrounding venous branches were ligated using vascular clips. A dermal matrix bilayer was applied with silicone layer up with the flap laid back down onto donor site for delayed inset. This was secured with circumferential Nylon suture. Flap was delayed for 6 days where a small amount of desiccated fat was noted to proximal aspect during this time interval.

The next procedure involved repeat surgical debridement with an intra-operative decision to de-epithelialize the distal aspect of the flap due to extent of venous congestion. Areas which failed the pinprick test of the cutaneous tissue was sharply excised and a bilayer matrix applied to the excised area. Additionally, an offloading external fixator with footplate was applied to prevent pressure on the flap site.

A third procedure entailed additional excisional debridement of non-viable tissue and application of a split thickness skin graft to the donor site. A fourth debridement was performed approximately 6 weeks post initial surgery with application of split thickness skin graft to the de-epithelialized area of the posterior heel.

Results

The external fixator was removed after 7 weeks once there was evidence of flap viability. Due to non-compliance with non-weightbearing status, patient was subsequently treated with repetitive total contact casting. He developed subsequent dehiscence of the split thickness skin grafting to the heel which prolonged treatment with total contact casting. Patient was periodically lost to follow up several months after frame removal due to transportation issues, but did not experience extensive dehiscence of flap during that time. A pinpoint wound measuring 0.4 x 0.2 cm which probed to calcaneus remained and warranted closure with local bilobed flap.

Intra-operative and post-operative clinical progression of reverse sural artery flap



Analysis and Discussion

The modification of adipofascial flaps have been known to allow for decreased flap volume which in turn prevents venous congestion to the paddle. This is done by allowing an increase in exudation via the meshed skin autograft during the first few post-operative days. Due to the patient's already compromised peroneal artery flow, maintaining as many distal perforators as possible is imperative for flap survival in such cases.

Conclusion

Patients with multiple medical co-morbidities require additional modalities in the orthoplastic physician's armamentarium with regards to chronic wound closure. The reverse sural artery flap is a work horse flap for coverage of soft tissue defects of the distal third of the leg, ankle, and foot. However, when faced with complications in flap viability, the appropriate modifications, which in this case was to de-epithelialize the proximal portion prior to inseting, allows for improved venous outflow as tissue is being removed to help mitigate further congestion. This modification should be included in such patient populations.

References

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