From Scraps to Grafts: Limb Salvage of a Diabetic Foot Burn with Underlying Critical Limb Ischemia

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Introduction

- Diabetic foot ulcer: A major cause of morbidity and mortality in the US.
- One in six patients with a DFU will have an amputation1. Amputation is a serious complication as it raises the mortality to 66% within 5 years1.
- Therefore limb salvage is critical for patient survival.

Aim

To heal a challenging wound after transmetatarsal amputation with insufficient skin for closure, by using a creative surgical technique as well as coordinating vascular intervention in a timely manner.

Materials and Methods

- HPI: 70 year-old Native American man presented to the Podiatry Clinic with a 2-day history of contact burn on left foot from a heater.
- PMH: Patient was ambulatory, with a history of DM, peripheral neuropathy, CKD IV on dialysis, CAD and HTN.
- PSXH: CABG, and right TMA.
- Physical Exam: VSS BP: 141/65 P: 89 RR: 18 T: 96.5 F(35.8 C)
- 1.5% TBSA third degree burn with a de-gloved left hallux and first ray, desiccated underlying tissue with a red base, surrounding ischemia with dry early gangrene extending to the midfoot.
- Non-palpable pedal pulses bilaterally.
- Labs: Elevated WBC (16.5).
- X-ray: No evidence of osteomyelitis.
- Vascular Findings:
  - DP/PT monophasic signal via Doppler.
  - Left foot ABI (0.66).
- Lower extremity angiogram diagnostic findings of single vessel outflow of posterior tibial artery (PTA) with occlusion of the proximal one third reconstituted distally with collaterals.

Vascular Intervention

- The patient underwent recanalization of the PTA using a retrograde pedal approach combined with balloon angioplasty resulting in a patent PTA without significant residual stenosis.

Surgical Intervention

- After 6 weeks, to allow for demarcation of the gangrene, the patient required a transmetatarsal amputation.
- During surgery, the plantar flap did not allow for closure without tension.
- Autologous full thickness skin graft obtained from the amputated specimen: −3.0cm x 4.0cm removed from dorsal side of forefoot, located just proximal to the digits.
- Skin graft prepared by stab fenestration and secured over medial wound using staples. A negative pressure dressing was then applied.

Results

- Graft take was 98%.
- The negative pressure dressing was discontinued after 3 weeks.
- The patient TMA site continued to heal and was well perfused.
- After 32-month follow-up, the graft remained well incorporated.
- The patient is ambulatory with customized extra-depth shoes.

Conclusions

To our knowledge, this is the first case documenting successful limb salvage using autologous skin transfer from amputated forefoot in combination with good wound care from a multidisciplinary team.

References