ABSTRACT

The primary goal of treatment for diabetic foot wounds is wound closure. Management toward this goal is determined by severity (grade), adequate limb perfusion, underlying disease processes, infection control and pressure offloading. Severe diabetic foot wounds with acute gas gangrene are among the most challenging wounds to treat. When gas gangrene is present, removal of the gangrenous tissue and aggressive treatment of infection is essential. Depending on the extent of gangrene, partial amputation of the limb may be necessary. Additional transluminal angioplasty may be required for limb salvage. The intent of this case series is to present the management and subsequent outcomes of three patients with severe diabetic wounds. Three male subjects were seen in the ER with acute diagnosis of gas gangrene of the foot, uncontrolled diabetes, severe peripheral neuropathy, acute osteomyelitis and a variety of multi-drug resistant organisms. All three patients had Wagner Grade IV diabetic foot wounds. One patient had a popliteal artery occlusion for which angioplasty was successfully performed. Each patient required deep surgical and ultrasonic debridement with partial amputation of the foot/toe. The most severe case required a transmetatarsal amputation. Each wound received a single application of Regenerative, Decellularized Skin Replacement* (RDSR*) which provided prompt coverage over exposed tendon and bone. NPWT provided an effective bolster and was subsequently utilized for 3 weeks. Treatment following this consisted of maintaining a moist wound environment with management of exudate as appropriate.

RDSR* is a decellularized dermal allograft which maintains the native structural and biomechanical properties including intact vascular channels to support angiogenesis. The wounds had 100% closure with complete epithelialization and an average closure time of 20 weeks. No further surgical procedures were required. RDSR* is effective in achieving diabetic wound closure in the most severe wounds providing support in limb salvage.

METHODS

- Upon presentation to ER, all 3 patients were determined to have:
  - Wagner Grade IV diabetic foot ulcer
  - Adequate limb perfusion – 1 patient had subsequent Transluminal Angioplasty for limb salvage
  - Uncontrolled diabetes
  - Osteomyelitis – variety of multi-drug resistant organisms
  - Severe Peripheral Neuropathy
- Immediate treatment included:
  - Deep surgical and ultrasonic debridement & appropriate partial foot amputation
  - Underlying disease process addressed
  - IV antibiotics
- Follow up treatment included:
  - Single application Regenerative Decellularized Skin Replacement*
  - Wound management to include non-adherent contact layer and NWPT was used for bolster purposes and until RDSR* was 100% adhered or angiogenesis was observed in the graft itself. Thereafter, Advanced Wound Care dressings were used to manage exudate as appropriate
  - Weekly Surface Area (SA) change from baseline was calculated weekly when possible
  - Appropriate Infection Control
  - Appropriate Pressure Offloading

RESULTS

- Immediate tendon & bone coverage upon application of RDSR* Average
- Weekly Wound Surface Area Reduction of 30% by week 4, with all cases achieving 100% closure with only 1 application of RDSR*
- Despite compliance issues and recurrent infections, no additional surgeries or amputations were necessary for any of the case series patients
- RDSR* is a decellularized dermal allograft which maintains the native structural and biomechanical properties including intact vascular channels to support angiogenesis
- RDSR* is effective in achieving diabetic wound closure in the most severe wounds providing support in limb salvage

CONCLUSIONS

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References

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