

Beyond Debridement: Limb Salvage in Severe Necrotizing Fasciitis Using Soft Tissue Expansion and Bioabsorbable Temporizing Matrix

Hayley Collins DPM, Ilya Makarovskiy DPM
Staten Island University Hospital; Staten Island NY

Introduction

Diabetic foot infections remain a major cause of morbidity, often progressing rapidly to deep soft tissue involvement and threatening limb viability. Early recognition and aggressive surgical management are essential to prevent systemic deterioration and preserve function.

Despite advances in wound care, achieving durable closure in the setting of extensive infection and tissue loss remains challenging. This case highlights the role of aggressive early and closely spaced debridements, combined with adjunctive reconstructive modalities, in successfully achieving limb salvage and accelerated healing.

Methods

A 65-year-old male with poorly controlled diabetes mellitus (A1C 13.9%) and prior left foot amputations presented with progressive pain, swelling, and ulceration of the left foot.

Laboratory evaluation:

- Diabetic ketoacidosis with hyperglycemia
- Elevated anion gap,
- Markedly elevated inflammatory markers (CRP 398.8, WBC 16.9).

Imaging revealed a plantar ulcer with rim-enhancing abscess extending into the abductor hallucis and extensor tendons with fascial fluid tracking concerning for early necrotizing infection.

On physical examination there was a plantar forefoot ulcer with necrotic tendon exposed, purulent drainage, malodor, and increased warmth.



The patient was initiated on broad-spectrum intravenous antibiotics, insulin infusion, and admitted to the intensive care unit for management of diabetic ketoacidosis and severe infection.

Results

A staged surgical approach was undertaken for limb salvage. Initial treatment consisted of emergent incision and drainage with debridement. Repeat debridement to fascia and tendon was followed by TMA.



Subsequent procedures included:

- Anterior and lateral compartment fasciotomies
- Placement of a soft tissue expander* with negative pressure therapy
- Revision of the amputation with expander adjustment,
- Delayed primary closure with biodegradable matrix**.



Over two weeks, five procedures spaced two to six days apart combined aggressive debridement, amputation, compartment release, tissue expansion, and biologic matrix application to optimize wound healing.



Conclusion

Aggressive early and closely spaced debridements were critical in controlling infection and establishing a viable wound bed. At one month postoperatively, following suture and graft removal, the surgical sites were fully healed, and the anticipated need for skin grafting was avoided. This case underscores that clinical success is achieved when aggressive debridement is prioritized and paired with adjunctive closure modalities, allowing for limb salvage and accelerated healing.

