

# Complex Diabetic Foot Ulcer

A case study by Michael K. Bednarz, DPM, AACFAS, Atlanta, GA

## CASE STUDY: UNITE® BIOMATRIX ADVANCED COLLAGEN WOUND DRESSING USED IN SUCCESSFUL COMPLEX LIMB SALVAGE PROCEDURE

The Unite® Biomatrix from Synovis Orthopedic & Woundcare, Inc. is a highly organized, non-reconstituted collagen dressing for the management of wounds. A variety of factors contribute to the nature of a chronic wound bed, including elevated levels of matrix metalloproteinases (MMPs) which inhibit normal healing. Flexibly crosslinked and sterilized\* using proprietary technologies, the Unite® Biomatrix is able to resist premature degradation caused by these elevated levels of MMPs. Clinical results suggest that this collagen dressing helps maintain the wound bed in the healing phase to allow for healthy granulation tissue and wound closure. The Unite® Biomatrix is safe, biocompatible, allows for reliable fixation to the wound perimeter, and has a 3 year room temperature shelf-life.

### ABSTRACT

A 62 year old male presented to the emergency room with a 45 day history of a Grade III ulceration on the dorsal aspect of the right foot resulting in an exposed extensor hallucis longus tendon and an abscess to the anterior leg compartment. The patient was taken to the OR where an incision and drainage was performed. Necrosis of the soft tissue in the anterior and lateral leg compartments was noted. The open wound was packed with iodoform gauze and the patient remained in the hospital on IV antibiotics. Given the amount of soft tissue necrosis, the patient was at risk for a below the knee amputation. Ten days after the initial surgery the patient was taken back to the OR where the wound was debrided and flushed via pulse-lavage irrigation with bacitracin. After one application of the Unite® Biomatrix collagen wound dressing, in combination with one application of Integra™ Matrix Wound Dressing (IMWD) and Negative Pressure Wound Therapy (NPWT), the wound healed in 15 weeks with no recurrent ulceration to that site.

### PATIENT HISTORY

The patient's medical history included: insulin-dependent diabetes mellitus, chronic lymphedema, and hypertension.

### PHYSICAL EXAM

Vascular: +2/4 pedal and femoral pulses b/l  
Neurologic: Sensation absent to the entire lower extremity below the knee per monofilament testing  
Musculoskeletal: Within normal limits

### PROCEDURE

Patient was taken to the OR where the right leg was scrubbed, prepped, and draped in the normal sterile manner. Debridement of all nonviable tissue was performed. Pulse-lavage irrigation with bacitracin was employed. IMWD was used to fill the deep undermining areas of the anterior and lateral leg compartments.



Figure 1. Initial presentation of wound with exposed extensor hallucis longus tendon.

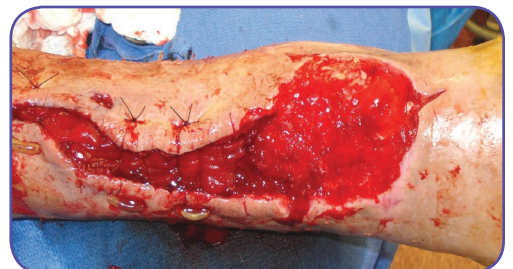


Figure 2. Debridement and wound preparation.



Figure 3. Application of Unite® Biomatrix.

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The non-fenestrated Unite® Biomatrix was meshed at a 1.0 cm to 1.5 cm ratio to increase the surface area of the collagen dressing and placed over the anterior leg and dorsal foot ulcerations. Care was taken to lay the Unite® Biomatrix directly over the IMWD on the anterior leg and dorsal foot. Surgical staples were used to circumferentially anchor the collagen dressing in place and trimmed to allow a 2-4 mm border beyond the wound margins. Unite® Biomatrix was then covered with an application of non-adherent Adaptic® followed by a sterile Jones compression dressing.

## POST APPLICATION MANAGEMENT

The initial dressing change was made three days after application and it was determined that the patient would also be treated with NPWT. To prevent direct contact between the NPWT sponge and collagen dressing, one layer of Profore® Wound Contact Layer was applied directly over the Unite® Biomatrix. NPWT was set at a continuous rate of 150 mmHg and was discontinued after two weeks when the collagen dressing was observed to be adhered to the underlying wound.

When NPWT was discontinued, the Unite® Biomatrix was covered with Mepilex® Ag (Mölnlycke) and subsequent dressing changes were performed every seven days until complete healing was achieved. At six weeks post-op, all surgical staples were removed. Collagen dressing material that remained on the wound bed was allowed to dissociate from the wound on its own.

As healing of the wound progressed, edges of the collagen dressing were trimmed as needed. Complete re-epithelialization was noted at 15 weeks post-application. It should be noted that the patient was allowed to bear weight in a fracture/CAM boot throughout the entire post-op period.

## RESULTS

- The combination of IMWD over the deep undermining aspects of the wound, NPWT to enhance granulation, and one application of the Unite® Biomatrix to support an environment for wound healing and re-epithelialization resulted in the healing of the 45 day chronic diabetic foot ulcer.
- At sixteen months post-application, the patient had not experienced re-ulceration at the wound site.

## DISCUSSION

Synovis Orthopedic & Woundcare's novel stabilization and sterilization technologies are new to advanced wound management. The Unite® Biomatrix collagen wound dressing easily conforms to the wound bed and resists premature enzymatic breakdown. This case study demonstrates successful clinical use of Unite® Biomatrix in a complex limb salvage patient.

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Figure 4. Two weeks post-op.



Figure 5. Eight weeks post-op.



Figure 6. 13 weeks post-op.



Figure 7. 15 weeks post-op.

# Synovis®

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\*Passes USP Sterility Testing. Data on file.

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