Managing Diabetic Foot Ulcers Using a Three Pronged Approach: V.I.P.

Jeffrey Roith, DPM
Overland Park, KS

Introduction:
Diabetic foot ulcers (DFUs) are a complication of diabetes that can be costly to treat, reduce quality of life, may lead to amputation, and even death. An excess of matrix metalloproteinases (MMPs) and decreased tissue inhibitors of metalloproteinases (TIMPs) may contribute to diabetic ulcers not healing. Vascular management (V), infection management and prevention (I), and pressure relief (P) are essential to DFU healing. Total contact casting is the gold standard for DFU management. However, off-loading alone will fail to present optimal outcomes if vascular disease or infection is not appropriately managed. Utilizing a total contact cast (TCC) system comprised of a clamshell cast with off-loading footplate* that includes products needed to address the V.I.P. can be helpful to manage DFUs.

Method:
Three DFU patient’s wounds were managed using ovine collagen with an intact extra cellular matrix (CECM) ** as a primary dressing and methylene blue and gentian violet (MB/GV) polyurethane (PU) antibacterial foam*** dressing to help manage bioburden as a secondary dressing and placed in a TCC system. The off-loading system provided a multilayer footplate that the clinician custom cuts for each patient. The unique clamshell cast provided a 7-layer fiberglass structure to accommodate different sized patients while maintaining durability. All patients were placed in a CAM boot and were able to ambulate immediately after TCC system comprised of a clamshell cast with off-loading footplate was applied. Patients returned to the clinician’s office weekly for wound dressing and TCC system changes.

Results:
All three patients had wound closure within 12 weeks and without infection. The TCC system comprised of a clamshell cast with off-loading footplate provided the needed solution to provide V.I.P. treatment to these DFU patients.

Case Study 1
Patient: 56 year-old.
Past medical history:
- Hypertension, chronic obstructive pulmonary disease, diabetes, peripheral vascular disease, peripheral neuropathy, Charcot foot. Recurrent wound for the last 2 years. Current wound is six months old.
Previous wound management:
- Cellular tissue product, collagen with oxidized regenerated cellulose, debridement, and foam dressings were used for 21 weeks.
- CECM, OV/PU antibacterial PU foam used with an offloading diabetic shoe for 3 weeks. Despite advanced wound dressings and diabetic shoe, wound did not progress.
Wound management:
- CECM covered with OV/PU antibacterial foam were applied to the wound and secured with tape.
- Applied TCC system comprised of a clamshell cast with off-loading footplate.
- Changed weekly for a total of 8 applications.

Case Study 2
Patient: 45 year-old.
Past medical history:
- Diabetes, CVA, Charcot deformity.
Age of wound:
- 3 weeks
Previous wound management:
- Antibiotic ointment and off-loading with post-operative shoe.
Wound management:
- CECM covered with OV/PU antibacterial foam were applied to the wound and secured with tape.
- Applied TCC system comprised of a clamshell cast with off-loading footplate.

Case Study 3
Patient: 65 year-old who was initially seen prior for ischialpatic peripheral neuropathy and a bilateral charcot deformity with a wound on the plantar aspect of the right foot.
Past medical history:
- Hypertension, Dyslipidemia, Coronary artery bypass graft x 3, Atrial fibrillation.
Previous wound management:
- Patient was treated conservatively for 8 weeks and refused casting until the wound failed to respond and close.
Wound management:
- CECM covered with OV/PU antibacterial foam were applied to the wound and secured with tape.
- Applied TCC system comprised of a clamshell cast with off-loading footplate.
- Wound closure was achieved in 6 weeks after adding these to the overall wound management plan.

Conclusion:
Without proper pressure relief, successful healing will be unlikely even when using advanced therapies. In these cases, the addition of the TCC system comprised of a clamshell cast with off-loading footplate, which includes CECM and OV/PU antibacterial foam dressings, helped the wounds get back on a healing trajectory.

* Total Contact Casting
** CECM with OV/PU Antibacterial Foam
*** OV/PU Antibacterial Foam

References: