Treating Hard-to-Heal Wounds: An Evidence-Based Approach for DFU and Chronic Wounds

This is a brief summary of a presentation given at the annual conference of Wounds Canada, in Mississauga, Ontario, on November 16th, 2017. It has been produced with the financial support of Integra Life Sciences. The presenter was Robert Fridman, DPM FACFAS CWSP, a fellowship-trained podiatric surgeon at the Department of Orthopaedic Surgery at New York-Presbyterian Columbia University Medical Center and the Department of Surgery at New York-Presbyterian Weill-Cornell Medical Center.

Normal Wound Healing

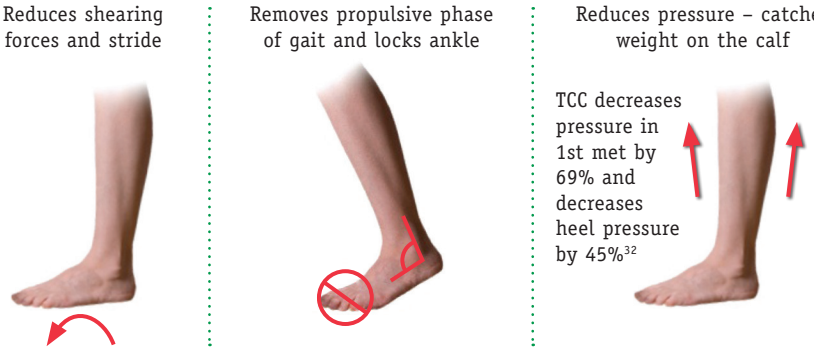
For health-care professionals, standard wound management consists of preparing the wound bed to support the healing process. When treating diabetic foot ulcers (DFUs), health-care professionals must work toward controlling infection, correcting ischemia, optimizing nutrition, correcting hyperglycemia and offloading of the wound.

Offloading

Offloading is one of the cornerstones of effective management of a diabetic foot ulcer, as it helps to minimize repetitive trauma to the area.

Total contact casting (TCC) has been established as the gold standard to achieve offloading while enabling patients to ambulate. TCC enables pressure to be transmitted to the cast wall or rearfoot, resulting in decreased forefoot pressure.

Figure 1. Mechanisms at work with TCCs



The device also reduces gait speed and shortens stride length, resulting in reduction of pressure. Ankle movement and the propulsive phase of gait are reduced, resulting in a reduction in vertical loading forces (see Figure 1). Ninety percent of DFUs have been shown to heal within six weeks when treated with a TCC.[4]

When Problems Arise

Forty-nine percent of diabetic foot ulcers may fail to heal despite traditional wound care.[1] According to a study by Sheehan et al.,[2] patients in whom the size of the ulcer does not reduce by half over four weeks of treatment are unlikely to achieve wound healing over a reasonable period. Early adoption of advanced care may be more cost-effective than traditional standard practices for decreasing the incidence of lower-extremity amputation and might speed the healing process.[3]

Non-Healing Wounds

Wounds fail to heal for a variety of reasons. While each of the factors shown in Figure 2 can contribute to compromised healing, there are treatment options to address each impediment. Trauma pressure can be combatted with appropriate offloading. Hypoxia vascular insult can be aided by revascularization efforts. Debridement techniques can be used to address infection, topical therapies for non-viable tissues and antibiotics for biofilm. Further, hostile wound conditions can be treated with advanced wound dressings and cellular tissue-based products (CTPs). Finally, nutritional support can help correct existing nutritional deficiencies.

When to Use Advanced Therapies

If all risk factors are addressed and corrected, but the wound is still not healing at a reasonable rate, then health-care professionals should consider using advanced wound therapies.

For DFUs, there are several advanced therapy options to consider, including offloading devices, negative pressure wound therapy, hyperbaric oxygen therapy, growth factors and supports for the extracellular matrix.

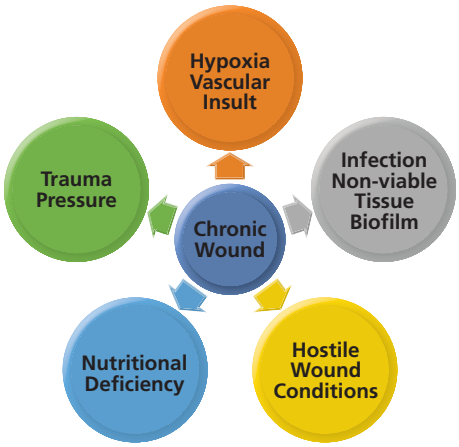
Supporting the Extracellular Matrix

Following comprehensive assessment, appropriate patient selection, sharp debridement and offloading, consider using Integra Dermal Regeneration Template IDRT, a skin replacement matrix designed to provide immediate wound closure and permanent regeneration of the dermis. This therapy provides the wound with a scaffold for cellular ingrowth and capillary growth and results in regenerated tissue comparable to embryonic dermis.

The product comes in three forms:

- Matrix alone for bulk filling spaces
- An injectable form for small spaces or tunneling
- Thin bilaminate sheet with silicone to act as an artificial skin with barrier functions.

Figure 2. Contributors to Non-Healing Wounds



A pivotal randomized controlled parallel group clinical trial, the FOot Ulcer New DErmal Replacement (FOUNDER) Study,[5] enrolled 307 patients at 32 sites. Patients were monitored for up to 29 weeks. The primary endpoint of the study was the incidence of complete wound closure at 16 weeks, as assessed by the investigator. The secondary outcome measures included time to complete wound closure, rate of wound closure, incidence of recurrence and change in quality of life metrics (see Figure 3).

In Summary

Based on several studies, it has been suggested that the use of advanced wound healing therapies can drastically improve the healing process for complex wounds such as DFUs. Application of a TCC or use of supports to the extracellular matrix can dramatically reduce the time it takes for these wounds to heal. When treating complex wounds, health-care providers should consider the appropriateness of advanced therapies if all risk factors have been addressed but the wound is still not healing at a reasonable rate.

Figure 3. Results of the FOUNDER Study

	ACTIVE	CONTROL	
# Patients	154	153	
Complete closure of ulcer during treatment phase (16 weeks)	51% (79/154)	32% (49/153)	>59% improvement over control
Median time to complete closure	43 days	78 days	5 weeks reduction in time to closure
Rate of reduction in wound size	7.2% per week	4.8% per week	50% improvement in rate of reduction of wound size
Median # Integra applications	1	N/A	

Faster healing + Fewer applications = Cost effective solution for DFU

For more information, visit www.integralife.com and http://outside-us.dermasciences.com/.

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