RAPID HEALING OF A CHRONIC TROPHIC ULCER IN A PATIENT WITH PERIPHERAL VASCULAR AND AUTOIMMUNE COMORBIDITIES USING A NOVEL SELF-ASSEMBLING PEPTIDE-BASED ADVANCED WOUND DRESSING

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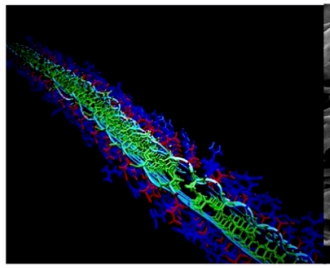
Background

The management of trophic ulcers poses significant difficulty due to their recurrent and recalcitrant nature. Furthermore, treatment algorithms are often complicated by associated systemic pathologies, which can bring devastating complications, such as amputations.[1] While crucial to treat underlying diseases, it is equally important to ensure an effective local wound-management strategy to prevent complications stemming from a chronic ulcer.

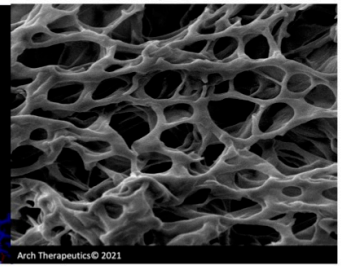
Technology: AC5 Advanced Wound System[2]

AC5 Advanced Wound System (AC5) is a novel dressing. The mechanism of action derives from the physiochemical properties of its synthetic peptide. Upon exposure to ions in wounds, peptide units self-assemble into higher ordered nanofibrils and nanofibers before culminating in an entangled network. An extracellular matrix-like structure that contours to the macro and micro architecture of the wound milieu is formed. The network resembles that of collagen and provides a scaffold, enabling cell migration and proliferation as well as repair of damaged tissue.

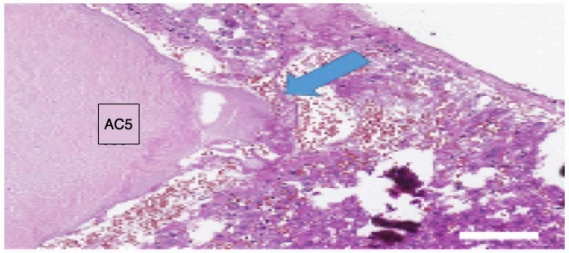
AC5 Nanofibril[3]



Electron Micrograph of AC5[3]



Contiguous Cohesive AC5 Nanofiber Network[3]



Case Study

A 59-year-old female patient presented with a non-healing trophic ulcer on the left lateral malleolus. The patient had a complex medical history with multiple systemic comorbidities, including lupus, scleroderma with Raynaud's phenomenon, small vessel peripheral vascular disease, and right below-the-knee amputation secondary to small vessel disease and a prior non-healing ulcer. The current ulcer had persisted for four years despite the use of extensive standard and advanced wound care interventions, including debridement, moist wound healing, nitro paste, and skin substitutes.

Methods: AC5 Preparation

Using an 18-gauge needle attached to a 3ml syringe, 1.5ml of sterile water was transferred to the vial containing the lyophilized peptide. Leaving the needle in place, this vial was then gently shaken until the peptide was completely dissolved in the sterile water. The solution was then drawn directly into the syringe and the needle removed from the vial. An 18-gauge blunt applicator was attached the syringe. A small amount of the solution was expressed to prime the blunt applicator.

Methods: Procedure & Application

AC5 was applied to the wound following excisional debridement, and the wound was covered with Xeroform and a dry secondary dressing. Subsequent applications of AC5 were performed weekly, for a total of three applications.

Results

Treatment with just two applications of AC5 resulted in a dramatic healing of the ulcer, demonstrated by a greater than 90% reduction in wound volume at week 2 visit. At the patient's last visit on Day 19, the wound was completely epithelialized. The course of healing progression is shown in *Figure 1*.

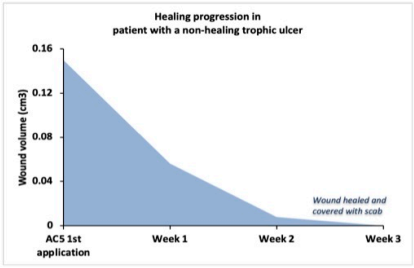


Figure 1: Wound healing progression, as demonstrated by 100% closure with three weekly applications of AC5

Conclusions

Complete healing of this recalcitrant trophic ulcer, which was unresponsive to multiple wound management regimens during the prior four years, was achieved with only three applications of AC5 in less than three weeks. The phenomenon was particularly impressive, considering the patient's multiple vascular and autoimmune diseases, known to hinder the progression of wound healing and likely contributing to failure of prior wound-care regimens.

References

[1] Puri, P. et al, Trophic Ulcers - Practical Management Guidelines, Indian J Plast. Surg. 45(2): 340-351, 2012.
[2] AC5® Advanced Wound System, Arch Therapeutics, Inc., Framingham, MA
[3] © 2019 Arch Therapeutics, All Rights Reserved; Data on File
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Disclosures

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