

A Novel Approach to Treating Lower Extremity Diabetic Ulcers Utilizing a Combination Of A Topical Dehydrating Chemical Agent & Ovine Forestomach Matrix Xenografts Containing A Layer Of Hyaluronic Acid

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INTRODUCTION

Lower extremity diabetic ulcers (LEDUs) are a common and highly morbid complication of diabetes.¹ Infections in LEDUs are a leading cause of hospitalizations and emergency department visits.^{1,2} The aim of this case report was to observe the response of a hard-to-heal LEDU on the medial aspect of the left foot in a 57-year-old female with poorly-controlled diabetes after initiating wound bed preparation via chemical debridement with an active gel containing methane sulfonic acid, which has rapid desiccating (hygroscopic) properties (*DEBRICHEM, DEBx Medical, Amsterdam, Netherlands) followed by the routine application of a xenograft composed of a layer of glycosaminoglycans (hyaluronic acid) between sheets of ovine forestomach-derived extracellular matrix (OFM); (*Symphony, Aroa Biosurgery, Auckland, New Zealand).

METHODS

The setting of this case report was a hospital-based outpatient diabetic wound care clinic at Vaiola Hospital in the Kingdom of Tonga. Her A1c was 13%. The patient's left LEDU was treated with standard dressings, including alginate dressings and hypochlorous acid gel, along with selective sharp debridement for 38 days. However, there was no significant improvement. On 07/19/2024, a topical dehydrating agent (TDA) was applied to prepare the wound bed (fig. 1 & 2). On 07/21/2024, the patient developed a deep tissue injury after wearing tight-fitting shoes to church. An offloading boot was provided on 7/24/2024. On 7/25/2024, an OFM graft containing a layer of hyaluronic acid was added to her treatment regimen (Fig. 3).

RESULTS

The On 7/19/2024, the patient's left LEDU was treated with more aggressive sharp surgical debridement followed by the application of a topical dehydrating agent to effectively reduce biofilm. The wound base had the expected caramelized appearance after removal of the dehydrating gel. The standard of care techniques were continued while on 7/25/2024 an OFM graft containing a layer of hyaluronic acid was added to her treatment regimen. Ninety-six days after the initial chemical debridement using a topical dehydrating agent, the left foot LEDU reduced in area by 88% (Fig 4). From 07/25/2024 to 09/21/2024, a total of five applications of the ovine ECM graft containing a layer of hyaluronic acid were applied. On average, the xenografts were placed every 12 days. By 11/6/2024 the LEDU had resolved (Fig 5).

* DEBRICHEM and Symphony grafts donated by DEBx Medical and Aroa Biosurgery respectively to the charitable diabetic foundation 'Amanaki Fo'ou for use in the wound clinic at Vaiola Hospital in the Kingdom of Tonga.



Learn more about the mission of 'Amanaki Fo'ou.

Results



Fig. 1: Following basic cleaning of the wound and peri-wound area, the single-use vial of the TDA should be applied over the wound bed and one cm of the peri-wound skin. After being left in place for 60 seconds, the gel is diluted and removed by rinsing with saline or sterile water. After application, there is no specific requirement for dressings or other interventions, and these can be used at the clinician's discretion.



Fig. 2: The wound base may have a caramelized appearance after removal of the dehydrating gel. The dehydrating agent is indicated for non-surgical debridement and treatment of hard-to-heal wounds that are infected and contain biofilm and/or necrotic tissue. Several contraindications apply, including ischemic wounds before effective revascularization; neoplastic wounds; underlying abscesses or fasciitis that require incision/excision and drainage; underlying osteomyelitis; exposed cartilage and/or intolerance or allergies to any of the product ingredients.

References

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Results



Fig 3: On 7/25/2024 the initial ovine ECM containing a layer of hyaluronic acid xenograft was added to the patient's treatment regimen.



Fig 4: By 10/09/2024 the left LEDU had reduced in surface area by 88% and continued on a trajectory towards closure.

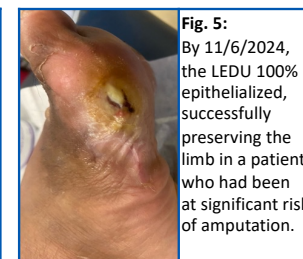


Fig. 5: By 11/6/2024, the LEDU 100% epithelialized, successfully preserving the limb in a patient who had been at significant risk of amputation.

DISCUSSION

This case report introduces the use of chemical debridement with a topical dehydrating agent, which effectively reduces bioburden and is subsequently followed by routine applications of an OFM xenograft containing hyaluronic acid to facilitate a trajectory toward closure. This approach resulted in a significant reduction in wound size, even in a patient with poorly controlled diabetes.

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