



(CASE REPORT)



An advanced decellularized dermis intended for soft tissue repair: A new surgical approach for DFU

Sanjay Sharma ¹ and Giampietro Bertasi ^{2,*}

¹ *Foot Secure, Foot and Ankle Clinics, Bengaluru, India.*

² *Department of Biotechnology, University of Padua, Italy.*

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Abstract

Skin substitutes are heterogeneous group of biological and/or synthetic elements that enable the temporary or permanent occlusion of wounds. Although dermal substitutes can vary from skin xenografts or allografts to a combination of autologous keratinocytes over the dermal matrix, their common objective is to achieve the greatest possible similarity with the patient's skin. The acellular dermal matrix allows the body to rebuild its own strong tissue without the need for alloplastic material. The three-dimensional collagen will be replaced by vital new tissue. An alternative treatment for diabetic foot ulcers is a matrix scaffold for new tissue generation, an acellular human dermal matrix (ADM) allograft. Decellularized human skin has been used for a variety of medical procedures, primarily involving wound healing, soft tissue reconstruction, and sports medicine applications.

Keywords: Wound Healing; Diabetes; Chronic Wounds; Skin Substitutes; Skin Dressings; Matrices; ADM

1. Introduction

Chronic wound healing is characterized by a protracted inflammatory phase as a result of altered biochemistry where elevated levels of proteases, pro-inflammatory cytokines and reactive oxygen species are found. The consequence of this distorted biochemical profile is that tissue-degrading enzymes, in particular MMPs, interfere with protein synthesis and denature growth factors [3]. Current treatment strategies for skin wounds/tissue support mostly aim to replace lost tissue rather than support intrinsic self-healing mechanisms. However, new developments within the area of tissue-engineered scaffolds are leading to an ultimate goal of tissue regeneration rather than replacement [1][2]. Cell-extracellular matrix interactions not only guide and regulate cellular morphology, but cellular differentiation, migration, proliferation, and survival during tissue development, including, e.g., embryogenesis, angiogenesis, as well as during pathologic processes including cancer, diabetes, hypertension, and chronic wound healing [4-11].

2. Case

Patient: 49/Female with KHO DMT2, presented with a sloughy ulcer with purulent discharge on the lateral aspect of the right foot, with OM of the 5th MT Head. She was being treated elsewhere. (Fig. 1)

* Corresponding author: Giampietro Bertasi
Department of Biotechnology, University of Padua, Italy.



Figure 1 Sloghy and purulent ulcer

2.1. Treatment

Debridment. Systemic antibiotic and Urgo Clean Ag, (Fig. 2)



Figure 2 2 weeks after WBP

At day 15 grafted with Advanced Decellularized Dermis (Dermacell AWM)*. (Fig. 3)



Figure 3 Graft in situ



Figure 4 45 days post-op



Figure 5 70 Days post-op

3. Conclusion

Uneventful post-operative course and complete healing at 70 days post-op. (Fig. 5).

Compliance with ethical standards

Acknowledgments

We thank Lifenet Health, Virginia Beach, Virginia, USA, for providing Decellularized Dermal Matrix (Dermacell),

*Dermacell AWM is a technologically advanced Acellular Dermal Matrix that is used to treat diabetic foot ulcers, chronic non-healing wounds, and supplemental tissue support.

Disclosure of conflict of interest

The Authors declare that there is no actual or potential conflict of interest in relation to this case study.

Statement of informed consent

Informed consent was obtained from the participant included in the study.

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