



BACKGROUND

Chronic extremity wounds exert a significant cost on the healthcare system as well as to the patient, in the form of repeated office visits, infection risk, and need for amputation in severe cases. Multiple products and methods have been developed in an attempt to address these hard-to-heal cases, but there is little further recourse when these treatments fail.

INTRODUCTION

Though keratin has been recognized for centuries for its medicinal properties, it is only recently that its capacity to heal chronic wounds has been evaluated. In chronic wounds – those stuck in the inflammatory phase of healing – keratinocyte activation is suppressed.¹ When keratinocytes are activated by keratin application, they cause direct epithelialization of a wound bed via cellular migration and upregulation of basement membrane protein.^{1–3}

Keratin biomaterials, through this keratinocytic activation and other mechanisms, promote the creation of the anti-inflammatory M2 macrophages and improve phagocytosis to provide chronic wounds with healthier conditions in which they can progress past the stalled inflammatory phase, allowing a wound to move through the requisite proliferative and maturation phases toward complete healing.^{3–5}

METHODS

In this work, we report our success with ProgenaMatrix[®], a hydrogel wound covering that is the first ever human keratin-based skin substitute. When other methods for treating wounds including other skin substitutes, negative pressure therapy, and revascularization demonstrated limited success, ProgenaMatrix[®] was applied and progress measured at regular follow-up intervals.

It is our hope that combining the science behind keratin based skin substitutes and real patient evidence will help wound care specialists incorporate ProgenaMatrix[®] into their arsenal of treatments for hard to treat wounds.

RESULTS

Here, we present four chronic foot wounds in male patients that were complicated by diabetes, poor nutrition, poor local perfusion, and medical non-compliance. These patients had all received various standard chronic wound treatments with little response, and were considering partial foot, above, or below the knee amputations. After application of ProgenaMatrix® human keratin hydrogel matrix for just one week, chronic wounds in this case series were reduced in size and visually improved. Total closure was achieved in 89% of treated wounds, with an average healing time of approximately 4-6 weeks.

CONCLUSION

Use of applied keratin protein seems to consistently accelerate epithelialization rates in chronic and difficult to heal wounds.

ACKNOWLEDGEMENT

Bheki Khumalo is a paid consultant for ProgenaCare Global, LLC, maker of ProgenaMatrix[®] Human Keratin Matrix.

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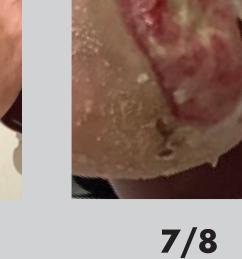
Treatment of Non-Healing Diabetic Foot Ulcers with Human Keratin Matrix Improves Clinical Outcomes

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6/23







7/15

CLINICAL CASE PATIENT 2: 52 YEAR OLD MALE

8/4



7/27

Diagnosis

8/3

Medical History Vascularity: DP 2/4, PT 2/4 Hypertension Parkinson's Disease (Parkinson's shuffle contributed to wound formation) Diabetes w/Neuropathy

Medications Depakote, Synthroid, Metformin, Blood Pressure Meds



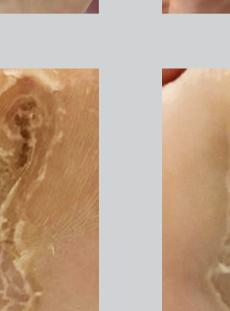




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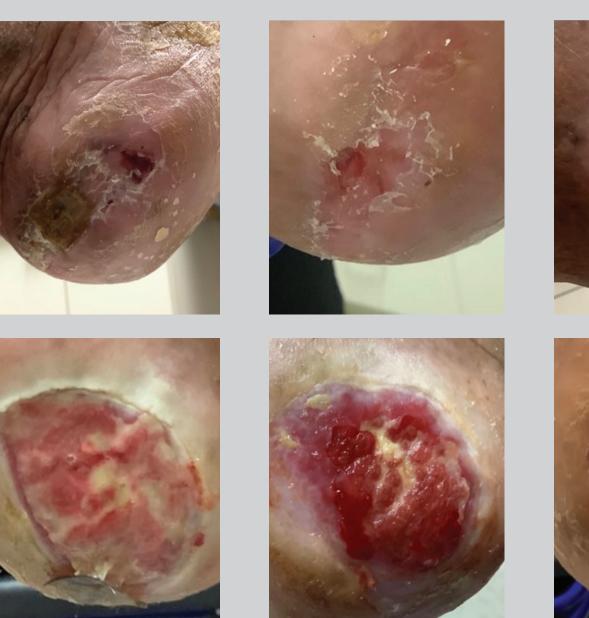
CLINICAL CASE



6/24

6/17

CLINICAL CASE PATIENT 1: 81 YEAR OLD MALE



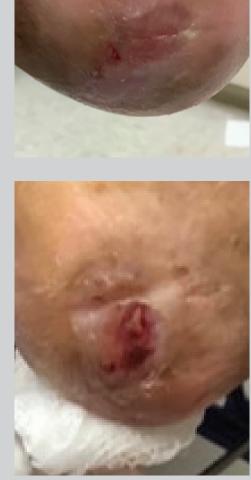




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9/1

Diagnosis DFU: Left & Right – Heel Pressure Injury/Decubitus Ulcer

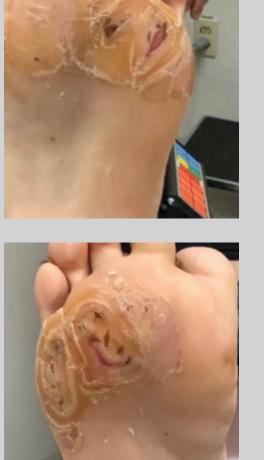
Medical History Vascularity: PT 1/4, DP 1/4 History of Stroke – Limited mobility COPD, Type 2 Diabetes, Hypertension

Medications Insulin, Metformin, Anticoagulants

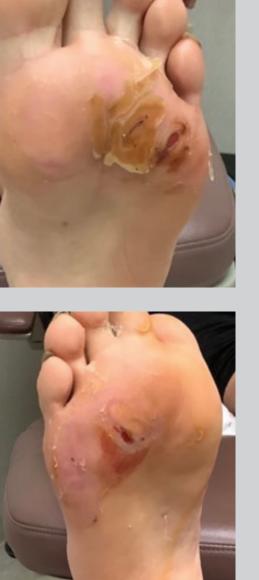




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Diabetic Foot Ulcers Left - Plantar Medial & Calcaneal Right - Plantar Medial Superficial burn of both feet Mechanical burn 2nd degree

Prior Treatment Irrigation & Debridement in Clinic

Dressing, Compression, Offloading Patient applied Silvadene Crème and wrapped

ProgenaMatrix[®]

Left Ball: 6 x 6 cm (2 weeks to full closure) Left Heel: 1 x 1 cm (2 weeks to full closure) Right: 1 x 1.5 cm (2 weeks to full closure)

Vascularity: DP 1/4, PT 1/4 Type 2 Diabetes w/Neuropathy History of Noncompliance

Medications

CLINICAL CASE PATIENT 4: 54 YEAR OLD MALE







2/17



Prior Treatment

2021 – January to April Amniotic Membrane Graft Left: 7 x 7 to 4.5 x 2.8 cm (13 wks) Right: 6 x 4 to 6 x 4 cm (6 wks) Wound reduced, but not closed

ProgenaMatrix[®]

2021 – June to August Left: 4.2 x 1.8 cm (3 weeks to closure) Right: 5.3 x 3.6 cm (8 weeks to closure)

Diagnosis

Bilateral Friction Diabetic Blisters (Crocs without Socks)

Medical History

Insulin, Metformin, Lyrica

Prior Treatment

2018 Amniotic Membrane Grafts Amputation of Great Right Toe

ProgenaMatrix[®]

2021 Left: 6 x 4 cm (4 weeks to full closure) Right: 9 x 5 cm (4 weeks to full closure)





3/17

Diagnosis DFU: Left - Foot Partial thickness burn caused by space heater

Medical History

Vascularity: Not compromised Type 2 Diabetes – Uncontrolled, Chronic Kidney Disease Stage 4, Diabetic Acidosis, Anemia, Neuropathy

Medications Insulin, Lasix, Tegretol, Lopressor

Prior Treatment 2021 – November

ER treated burn with antibiotic cream and dressing. Wound did not improve

ProgenaMatrix®

2022 – January Left Digit 2: 1 x 1.5 cm (2 weeks to full closure) Left Digit 1: 6 x 3.2 cm (wound still healing)