Novel Approach to Wound Healing Post Lower Extremity Amputation with Use of Three-Dimensional Collagen Wound Matrix

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INTRODUCTION

This case series demonstrates the use of Miro3D® Wound Matrix (Reprise Biomedical, Inc., Minneapolis, MN) a three-dimensional, porcine collagen matrix with 2 cm thickness, and Miro3D Fibers Wound Matrix, a blended version of Miro3D, as a beneficial solution for filling the deep wounds created post lower extremity amputation.

METHODS

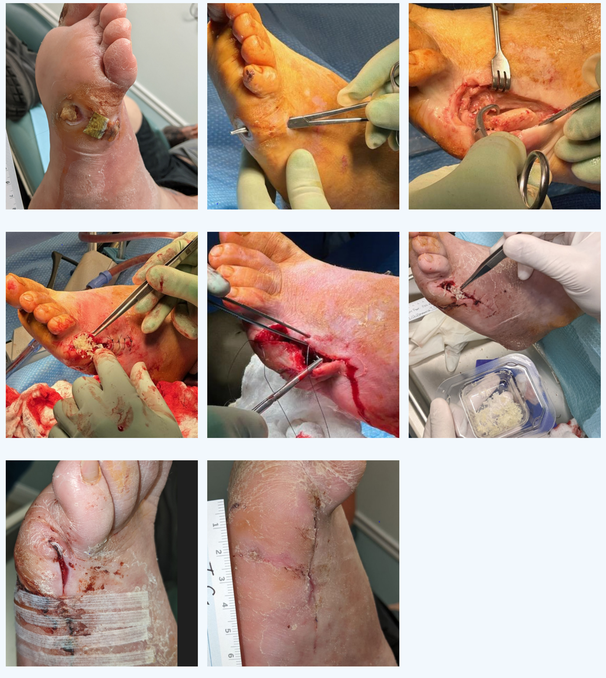
A retrospective case series was conducted on three patients with large wounds post lower extremity amputation treated with a three-dimensional, porcine-derived collagen wound matrix. Data collected included patient demographics, comorbid conditions, previous procedures and treatments, and wound characteristics. Healing rates, number of product applications, additional surgical treatments used, and adverse events were also reviewed. The protocol encompassed pre- and post-operative care, as well as comprehensive treatment throughout the continuum of care to assess wound healing rates and closure.

DISCUSSION

Due to complications and comorbidities related to diabetes mellitus and osteomyelitis, patients underwent amputation of their metatarsal or toes which resulted in deep, cavernous wounds following the surgery. All patients healed uneventfully following the application of Miro3D and Miro3D Fibers. Postoperatively, the integration of Miro3D and Miro3D Fibers resulted in wound healing and closure for each patient on an average of 48 days.

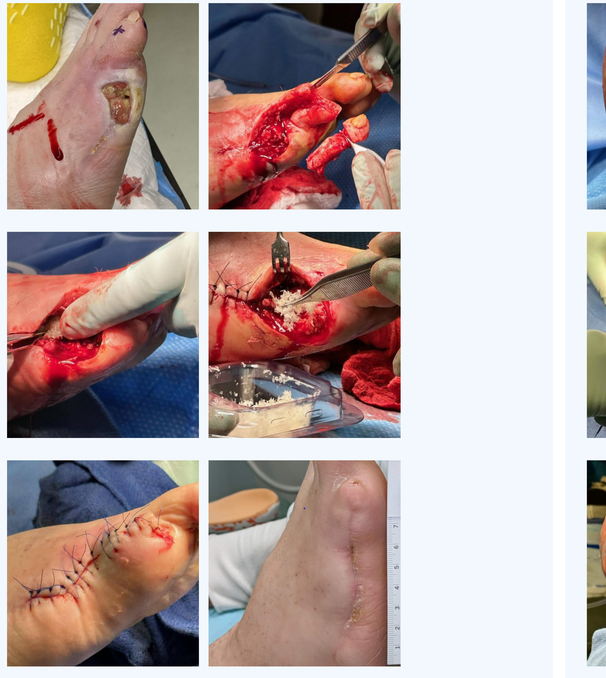
CASE #1

53 year old male with a DFU at the 5th metatarsal head of the left foot. Presented with acute cellulitis, osteomyelitis, and a sinus tract that exited dorso-laterally. A partial 5th ray and toe amputation was performed. Note, there was a pathological fracture to the metatarsal due to osteomyelitis. The wound post-amputation was packed with Miro3D, partially sutured, and then packed with Miro3D Fibers. A wound vac was applied. On post day 12, Miro3D Fibers were re-applied to the wound. Wound vac therapy was discontinued on post day 21. Full healing was achieved on post day 46 from the initial application of Miro3D and Miro3D Fibers.



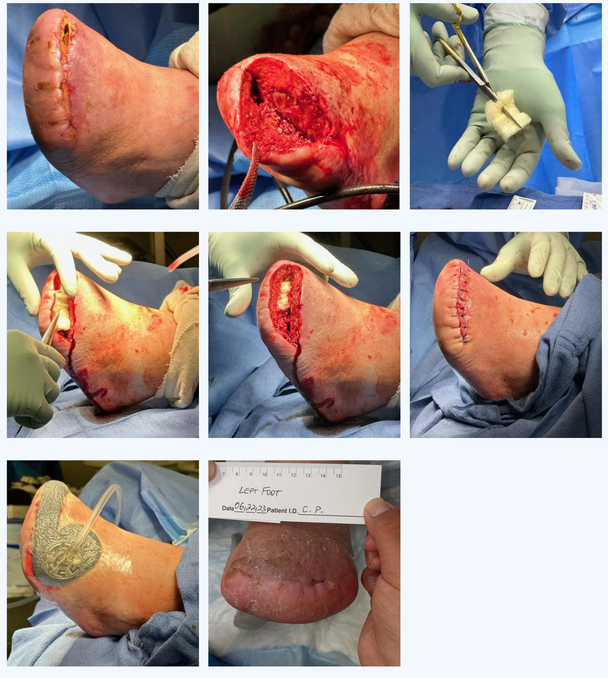
CASE #2

64 year old male with a history of Type 1 diabetes and previous 5th ray amputation of the right foot, fractured his right 4th toe which led to ulceration and infection. X-rays revealed osteomyelitis to the 4th metatarsophalangeal joint and septic arthropathy. The 4th toe and metatarsal head were resected, and the 4th metatarsal was injected with antibiotic impregnated bone cement. Skin from the 4th toe was used to create a flap. The wound was packed with Miro3D and Miro3D Fibers and closed. A wound vac was applied. Full healing was achieved on post day 50.



CASE #3

82 year old male with a history of Type 2 diabetes, peripheral artery disease, and osteomyelitis of the 1st metatarsophalangeal joint of the left foot underwent a transmetatarsal amputation that resulted in a wound dehiscence and infection of the 2nd metatarsal shaft. A revision was performed three months later. The wound and bone were debrided, and bone cultures were obtained from the 2nd metatarsal shaft. The wound was packed with Miro3D, sutured closed, and a wound vac was applied. Full healing was achieved on post day 48. 35 days postoperatively, wound measured 1.5 cm x 1.5 cm x 0.5 cm and a 2nd application of 3D wound matrix was applied. 84 days following the initial application of 3D graft (49 days from the 2nd application), wound was fully closed.



CONCLUSION

The three-dimensional, porcine collagen matrix, sold under the tradename Miro3D, is an innovative technology designed to fill deep, tunneling, and irregular wound beds. The unique porous structure of the collagen matrix serves as a scaffold that enables conformity and rapid integration into the wound bed. The application of Miro3D and Miro3D Fibers in a closed wound, followed by standard wound care, was shown to be effective for treating these challenging lower extremity wounds.

Study sponsored by: Reprise Biomedical, Inc.

Miro3D wound matrix is indicated for the management of wounds, including: partial and full-thickness wounds; pressure ulcers; venous ulcers; chronic vascular ulcers; diabetic ulcers; tunneled, undermined wounds; trauma wounds (abrasion, lacerations, partial thickness burns, skin tears); drainage wounds; and surgical wounds (donor sites/grafts, post-Mohs surgery, post-laser surgery, podiatric, wound dehiscence).

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