

3-Dimensional Wound Matrix for Deep, Tunneling and Challenging Wounds

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INTRODUCTION

The United States spends an average of \$26.8 billion per year on treating pressure ulcers¹. Over 2.5 million are affected annually, with nearly 65,000 deaths². Pressure ulcers not only lead to expensive complications and lengthy hospital stays but are also costly to facilities. Hospital-acquired pressure injuries, for example, cost facilities anywhere from \$500 to more than \$70,000 per episode.¹ A 3-dimensional (3D) porcine liver-derived wound matrix provides an intact collagen scaffold for treating deep wounds in areas such as tunneling, sinus tracts, and undermining. This product seeks to address the needs of those with deep, challenging wounds to speed healing, potentially saving significant healthcare dollars^{3,4}. We present a case study of Stage 4 sacral and hip pressure ulcers treated with the 3D wound matrix (Reprise Biomedical, Inc., Plymouth, MN).

METHODS

We present a case of 3-year-old progressive Stage 4 pressure ulcers of the sacrum and right hip in an 82-year-old female. She is paraplegic, has Type II diabetes and hypertension, and suffered a complicated left limb injury that did not heal correctly resulting in a prolonged hospital stay. This led to a deep sacral ulcer, later complicated by a right hip ulcer. She has undergone and failed conservative measures, offloading, skin substitutes, and hyperbaric oxygen treatments. Her progress has been complicated by hospitalizations, right hip osteomyelitis, frequent antibiotic use with C. diff complications, resulting in multiple healthcare dollars in aids and offloading equipment/supplies.

At the initiation of treatment, the sacral wound measured 2.4 x 1.7 x 0.5cm with an undermining ridge from 12 o'clock to 3 o'clock. The right hip wound measured 4.3 x 4.1 x 1cm, with a posterior lateral tunneling tract of 1cm. Additionally, the hip wound had an undermining ridge of 1.5cm from 9 o'clock to 3 o'clock. Miro3D was applied to both wounds^{3,4}.

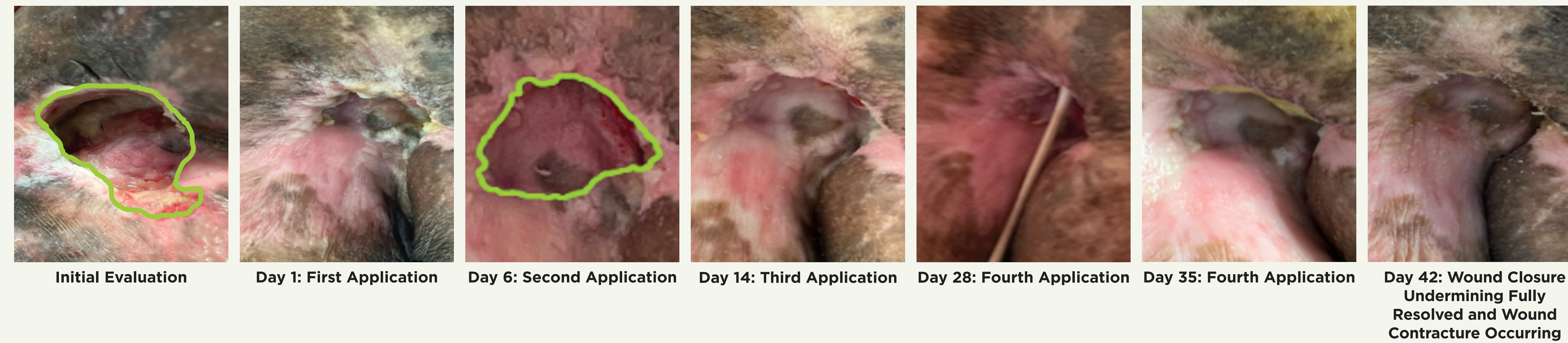
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RESULTS AND DISCUSSION

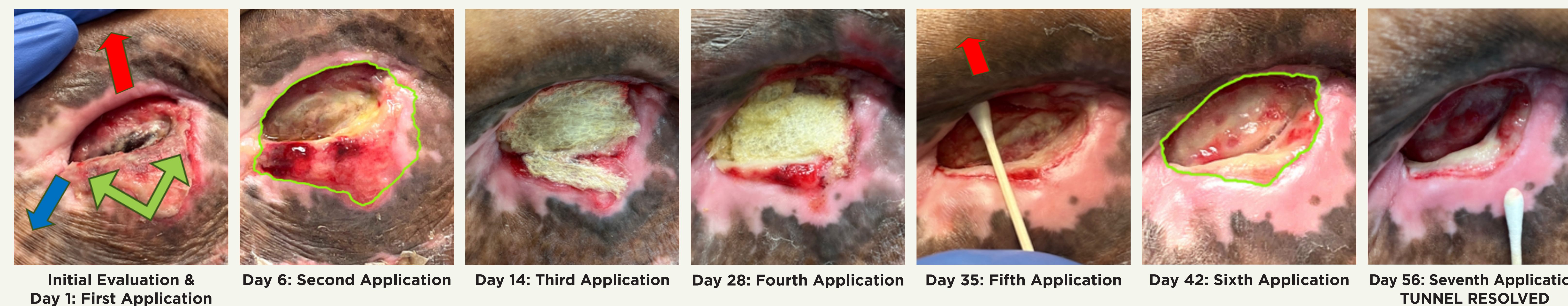
Upon follow-up, there was 100% graft uptake weekly. Both wounds responded well to the 3D wound matrix. The sacral ulcer showed significant improvement after four treatments with Miro3D. The undermining resolved by day 35, and the entire wound bed closed by day 42. The right hip ulcer also responded positively to treatment. Tunneling resolved by day 56 after six treatments of Miro3D, and there was a significant decrease in the main wound bed during the treatment period, following three years of non-healing wound progression.

SACRAL ULCER



DAY	WOUND MEASUREMENTS	UNDERMINING	MIRO3D APPLICATION
Initial evaluation	4.3cm x 3.5cm x 0.5cm	Rim: 1.3cm (10 to 4 o'clock), Tunnel: 1.5cm (1 o'clock)	Sep 2022
1	2.4cm x 1.7cm x 0.5cm	Rim: 0.75cm (12 to 3 o'clock), Tunnel-resolved	First application, Dec 2023
6	2.4cm x 1.7cm x 0.5cm	Rim: 0.75cm (1 to 3 o'clock)	Second application
14	2.1cm x 1.5cm x 0.3cm	Rim: 0.5cm (1 to 3 o'clock)	Third application
28	2.0cm x 1.5cm x 0.3cm	Rim: 0.3cm (1 to 3 o'clock)	Fourth application
35	0.5cm x 0.5cm x 0.2cm	RESOLVED	
42	CLOSED		

RIGHT HIP/TROCHANTER ULCER

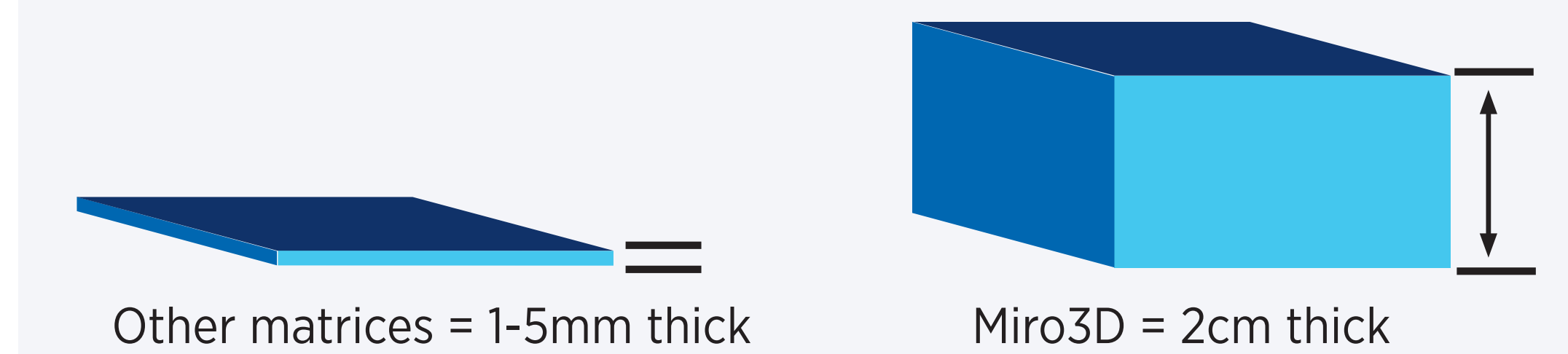


DAY	WOUND MEASUREMENTS	UNDERMINING & TUNNELING	MIRO3D APPLICATION
Initial evaluation	4.3cm x 4.1cm x 1cm	Undermine : 1.5 cm (9 to 3 o'clock), 1cm tunneling tract	First application
6	4.3cm x 4.2cm x 0.7cm	Undermine : 1.0 cm (9 to 3 o'clock), 0.75cm tunneling tract	Second application
14	3.8cm x 3.5cm x 0.7cm	Undermine : 0.75 cm (9 to 3 o'clock), 0.5cm tunneling tract	Third application
28	3.5cm x 3.0cm x 0.7cm	Undermine : 0.5 cm (12 to 3 o'clock), 0.5cm tunneling tract	Fourth application
35	3.5cm x 2.7cm x 0.5cm	Undermine : 0.25 cm (1 to 3 o'clock), 0.5cm tunneling tract	Fifth application
42	3.5cm x 2.7cm x 0.5cm	Undermine : 0.25 cm (1 to 3 o'clock), 0.5cm tunneling tract	Sixth application
56	3.1cm x 2.0cm x 0.3cm	Undermine : 0.25 cm (1 to 3 o'clock), TUNNEL RESOLVED	Seventh application

CONCLUSION

Reprise Biomedical's 3D wound matrix, a 2cm thick cubical sheet structure available in four sizes, is specifically designed to address deep, tunneling, undermining, and irregular wounds^{3,4}. This innovative matrix offers a conformable and effective solution in resolving challenging wounds, potentially reducing healing times significantly, especially in complicated cases. The successful outcomes observed in this case study highlight the efficacy of Miro3D in promoting wound healing. Both the initial non-healing three-year progressive sacral ulcer and the tunneling of the right hip ulcer resolved within weeks, and the main wound bed of the right hip ulcer significantly decreased in size during the treatment period. Furthermore, scientific literature supports the effectiveness of acellular matrix-like products in wound repair and regeneration, underscoring the potential of advanced wound management approaches in clinical practice⁵.

Unlike thin grafts, Miro3D provides volume in deep wounds.



REFERENCES

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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/grfts, post-Mohs surgery, post-laser surgery, podiatric, wound dehiscence).

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