

New Biomimetic Matrix Results in Rapid Healing Response of Complex Pressure Ulcers with Exposed Structures



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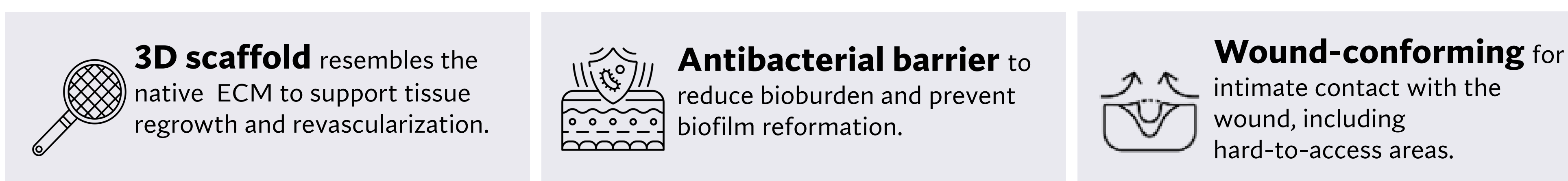
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Introduction

With an underreported prevalence of 2.5 million in the United States, pressure ulcers are associated with pain, infection, and high mortality rates¹. The estimated costs of hospital-acquired pressure ulcers are \$26.8 billion per year, with over 50% attributed to managing Stage 3 and Stage 4 injuries¹. The ideal treatment provides an environment conducive to healing while preventing infection, reducing pain, and preserving peri-wound skin quality. This small case series evaluates the efficacy of a novel **self-assembling peptide biomimetic matrix (BMM)** in pressure ulcers with exposed structures. As a wound-conforming extracellular matrix-like scaffold with antibacterial protection, BMM was engineered to facilitate healing of complex wounds.

Figure 1: Features of the novel self-assembling peptide biomimetic matrix (BMM)



Methods

Four patients with multiple comorbidities presenting with hard-to-heal stage 4 pressure ulcers were selected to receive a novel **FDA-approved flowable BMM™ (G4Derm™ Plus, Gel4Med Inc.)** in addition to standard of care (SOC). Amongst the four patients, five wounds [four of which presented tunneling / undermining] were treated with BMM, applied as per manufacturer's instructions. Wound measurements, pain, exudate, and peri-wound skin appearance were assessed at baseline and monitored during following visits.

Table 1: Patient medical history and wound characteristics

Patient # - Wound #	Medical History	Wound type	Wound location	Wound age (months)	Previous treatments
1-01	Paraplegia, Sepsis, Osteomyelitis, COPD, Smoking	Stage 4 Pressure Ulcer	Left Hip	2	SOC, Antimicrobials
2-01	Paraplegia, PVD, Neuropathy, Hypertension, Hyperlipidemia	Stage 4 Pressure Ulcer	Left Hip	30	SOC, Antimicrobials
3-01	Heart Failure, Diabetes, COPD	Stage 4 Pressure Ulcer	Left Hip	10	SOC
4-01	Quadriplegia, Diabetes, Heart Failure, Osteomyelitis, Sepsis	Stage 4 Pressure Ulcer	Right Hip	24	SOC, Antimicrobials, Ultrasound therapy
4-02	Quadriplegia, Diabetes, Heart Failure, Osteomyelitis, Sepsis	Stage 4 Pressure Ulcer	Left Hip	24	SOC, Antimicrobials, Ultrasound therapy

References

Gould LJ, Alderden J, Aslam R, Barbut A, Bogie KM, El Masry M, Graves LY, White-Chu EF, Ahmed A, Boanca K, Brash J, Brooks KR, Cockron W, Kennerly SM, Livingston AK, Page J, Stephens C, West V, Yap TL. WHS guidelines for the treatment of pressure ulcers-2023 update. Wound Repair Regen. 2024 JanFeb;32(1):6-33.

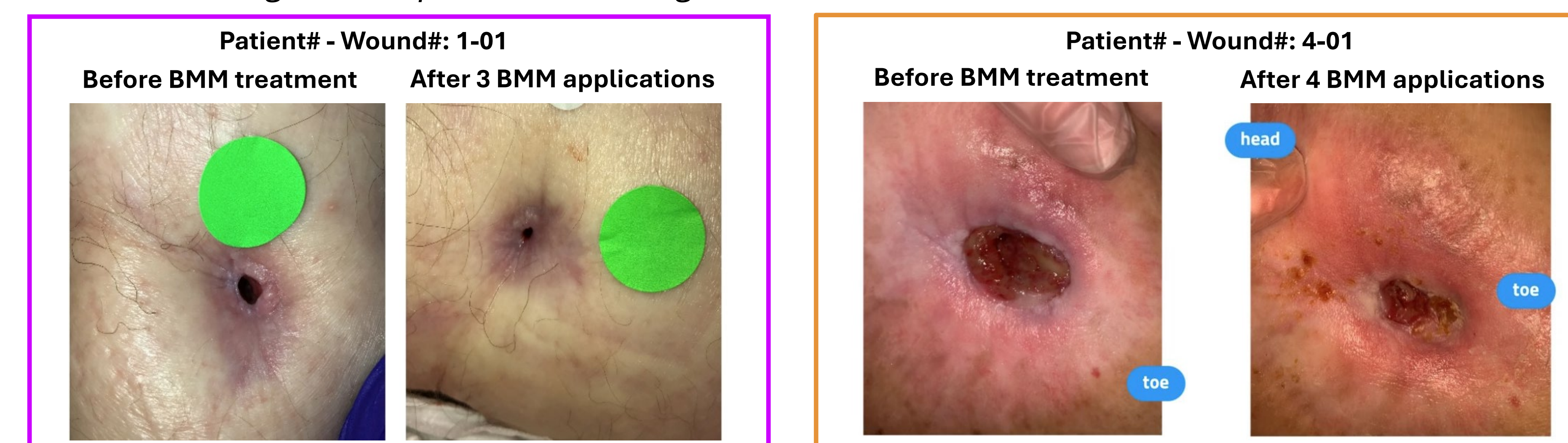
Results

Despite the wound chronicity, severity, and previous treatment failures, all the pressure ulcers in this case series responded positively to BMM, showing **rapid healing progression**. All five wounds showed a **substantial wound volume reduction after a single application** of BMM. Easy access of BMM to hard-to-reach areas was also noted and, in most cases, resulted in rapid **progress towards resolution of tunneling**. A substantial **improvement in exudate** was also observed along with an overall improvement in the peri-wound skin appearance and integrity. No pain, signs of infection, or other adverse events were noted after BMM treatment.

Table 2: Baseline wound measurements and changes after BMM treatment

Patient # - Wound #	Baseline Wound Area	Baseline Wound Depth	# BMM applications	% Area Reduction	% Volume Reduction	Change in tunneling
1-01	0.10 cm ²	3.0 cm	3	10.0%	34.0%	From 3.0 cm to 2.2 cm
2-01	0.90 cm ²	1.2 cm	3	55.6%	70.4%	From 3.1 cm to 2.1 cm
3-01	6.25 cm ²	0.3 cm	2	76.0%	76.0%	No changes
4-01	1.40 cm ²	5.3 cm	4	57.1%	66.0%	From 5.4 cm to 4.4 cm
4-02	0.15 cm ²	2.4 cm	4	60.0%	71.7%	From 2.4 cm to 1.9 cm

Figure 2: Representative images of wounds before and after BMM treatment



Conclusions

This case series demonstrates the potential of BMM for treating hard-to-heal pressure ulcers with exposed structures and tunneling by intimately contacting all wound areas, creating an environment that promotes tissue regrowth and revascularization, and preventing re-infection. Larger clinical trials with longer follow-up period are required to expand on these findings.

