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Research Article

At-Home Use of Collagen–Mānuka Honey–Hydroxyapatite Dressing for Traumatic Wound Care: A Preliminary Three-Patient Case Series

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Abstract:

Traumatic wounds present complex challenges due to tissue loss, contamination risk, and delayed healing, often requiring resource-intensive interventions such as negative pressure wound therapy, grafting, or repeated clinical visits. There remains an unmet need for affordable dressings that not only protect but also foster a stable wound environment and enable at-home management. The collagen–honey–hydroxyapatite dressing (CHD) combines collagen, Mānuka honey, and hydroxyapatite which are known to provide structural support, regulate inflammation, reduce bacterial burden, and promote angiogenesis and granulation. This case series reports outcomes in three patients with diverse traumatic wounds. Patient A, a healthy 26-year-old male with a puncture wound, achieved complete closure by Week 4. Patient B, an 88-year-old female with multiple comorbidities and a dog-scratch laceration, achieved closure by Week 6. Patient C, a 91-year-old male with a scalp wound complicated by prior radiation therapy and infection, demonstrated a 92% reduction in wound area by Week 4.5 despite travel-related treatment gaps. Across all cases, the CHD supported rapid granulation, wound stabilization, and steady progression toward closure, while enabling simplified at-home application. These findings suggest the CHD may represent a cost-effective, patient-centered alternative for traumatic wound management.

Key words: traumatic wound; collagen; medical-grade mānuka honey; hydroxyapatite; wound healing; patient-applied

Introduction

Traumatic wounds, whether caused by blunt force, laceration, or penetrating injury, present unique challenges in wound care. They often involve tissue loss, exposure of tendon or bone, high risk of bacterial contamination, and systemic factors such as hypoperfusion that can delay repair [1]. These conditions contribute to unpredictable healing trajectories, increased risk of complications, and long-term functional or cosmetic deficits [2].

Current management strategies include surgical debridement, grafting, negative pressure wound therapy (NPWT), and standard dressings [3]. While these can be effective, they frequently require specialized resources, repeated clinic visits, or create donor site morbidity. For traumatic wounds in particular, there remains an unmet need for dressings that not only provide coverage and protection but also foster a healthy wound environment, are simple to apply at home, and remain affordable for all patients.

VERIS™ (SweetBio, Inc., Memphis, TN, USA) is a low-cost, bioengineered wound dressing that could meet the aforementioned unmet need due to its composition of collagen, medical-grade Mānuka honey, and hydroxyapatite. Collagen provides a structural scaffold, supports fibroblast adhesion and proliferation, and helps regulate protease activity. [4-6]. Mānuka honey contributes to a balanced wound environment by limiting bacterial overgrowth, reducing inflammation, and enhancing growth factor activity [7-10]. Hydroxyapatite provides structural reinforcement and supports angiogenesis and granulation tissue formation [11-15]. Together, these natural components form a collagen–honey–hydroxyapatite dressing (CHD), which has demonstrated both in vitro bioactivity and clinical efficacy in chronic and acute wound settings.

Preclinical studies have shown that the CHD can contribute to a clean wound environment by reducing bacterial burden by 99.99% within 24 hours, while also downregulating macrophage secretion of matrix metalloproteinases (MMPs) such as MMP-9, a protease associated with prolonged inflammation and impaired healing. The CHD also stimulates fibroblasts to produce pro-healing growth factors including FGFb, VEGF, TNFα, SCF, and TGFβ [16-18]. Clinically, CHD use has been associated with faster healing, with reports of up to twice the closure rate in chronic ulcers compared to standard care and mean closure times of 4.1 weeks in private podiatry practice [19-20]. Complete closure has also been documented in as little as six weeks for surgical wounds managed by secondary intention [20,21]. These in vitro advantages including bacteria reduction, regulation of harmful protease activity, and stimulation of pro-healing cytokines, make the CHD a compelling option for traumatic wounds, where early stabilization of the wound environment is essential for recovery.

The CHD is distributed through a durable medical equipment (DME) model, enabling direct shipment to patients' homes. This model ensures timely access to wound care, reduces the need for repeat clinic visits, and is supported by simple, image-based instructions. It is also insurance reimbursable and affordable. In the present cases, the CHD was provided directly by the treating clinicians, allowing immediate access and straightforward application. This case series evaluated the use of the CHD in three vastly different patients with varying traumatic wounds.

Materials And Methods

Patient A: Immediate hospital treatment was wet-to-dry with Mepilex border upon discharge. (Mölnlycke Health Care, Peachtree Corners, GA, USA). The next day, the clinician provided the patient with the CHD. The CHD was hydrated with Vashe® Wound Solution (Urgo Medical North America LLC, Forth Worth, Texas) and applied every day for 1 week, then every 2-3 days under a silicone foam bordered dressing. The clinician provided weekly in-home follow-up visits.

Patient B: Clinician provided the patient with CHD. The CHD was hydrated with Vashe® and applied every other day under a silicone foam bordered dressing. The clinician provided weekly in-home follow-up visits.

Patient C: The CHD was hydrated with saline and applied every 3-4 days under DuoDERM® Extra Thin hydrocolloid dressing (Convatec, Bridgewater, NJ, USA). The physician provided the CHD to the patients to take home immediately after evaluation. Patient was instructed to apply the CHD every 3-4 days and were scheduled for routine wound evaluations at follow-up visits (Week 2 and 4.5).

All patients in this series experienced traumatic injuries that were treated with the CHD and provided consent for the use of clinical images and de-identified data in this report. Clinicians in each case took images and measurements at routine follow-up visits. Patients followed clinician guidance along with the given information and CHD technique guide which includes text and image-based instructions on how to apply. Wound closure was determined by the clinician via measurements and visualization of epithelialization.

The CHD is indicated for full and partial wounds including traumatic wounds healing by secondary intention. It is not indicated for patients with sensitivity to collagen and its derivatives, porcine-derived products, or honey. It should not be used on children or infants under 10 kg, on third-degree burns, or in wounds with active uncontrolled bleeding. While the CHD is not indicated to treat infection, one physician in this case chose to continue use of the CHD to treat the wound while using an oral antibiotic to treat the infection.

Results

Patient A, a 26-year-old male with no prior medical history, sustained a rebar puncture wound to the left thigh following a motorcycle crash. The initial wound measured 3.2 × 1.9 × 1.3 cm. Within three days of CHD treatment, the eschar and slough had resolved, and by Week 2 the wound exhibited rapid granulation tissue formation along with a marked reduction in volume. The patient reported satisfaction with wound healing after three weeks and discontinued use of the CHD until complete wound closure by Week 4 (Figure 1)

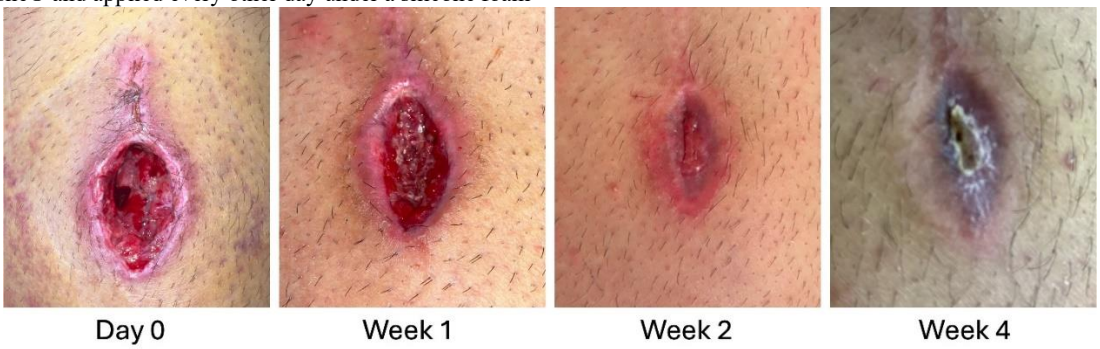

Figure 1. Healing progression of Patient A's puncture wound. At baseline (Day 0), the wound measured 3.2 × 1.9 × 1.3 cm. Complete closure was achieved by Week 4.

Patient B was an 88-year-old female with a history of hypertension, hyperlipidemia, anemia, bowel resection, congestive heart failure, venous insufficiency, cerebrovascular accident, anticoagulation therapy, and arterial disease. She sustained a dog-scratch laceration to the right lower extremity. The patient initially presented to urgent care, where she was prescribed antibiotics and instructed to leave the wound uncovered. After one week, she sought clinical guidance and started the CHD treatment with the wound measuring 8.1 × 0.8 × 1.2 cm. With regular application every other day, the wound demonstrated progressive granulation and size reduction. By Week 5, the wound was too small to continue the CHD application, and by Week 6, complete closure was achieved (Figure 2).

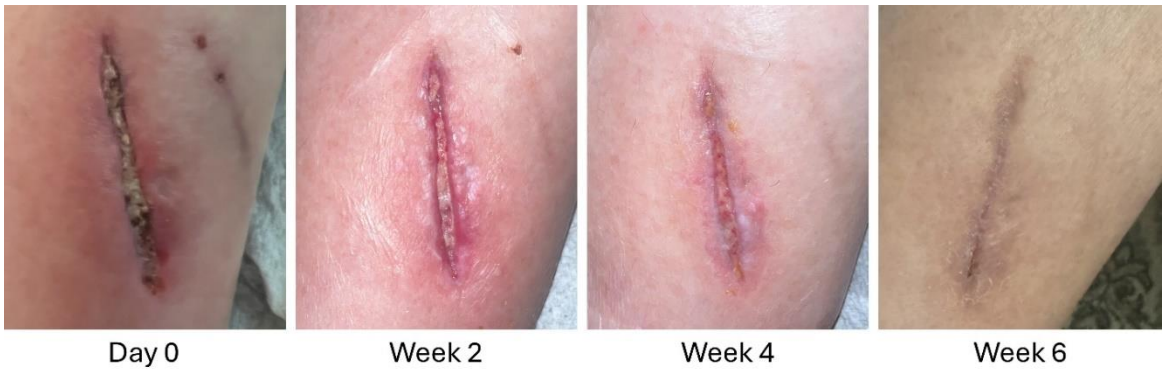

Figure 2. Healing progression of Patient B's dog scratch. At Day 0 baseline (one week post injury), the wound measured 8.1 × 0.8 × 1.2 cm. Complete closure was achieved by Week 6.

Patient C was a 91-year-old male with chronic obstructive pulmonary disease who sustained a fall-related wound to the scalp. The injury occurred in an area of previous Mohs surgery for a spindle cell neoplasm with perineural invasion, which had been treated with cryotherapy and adjuvant radiation therapy five years earlier. The patient developed a Klebsiella infection that responded well to oral Minocycline 100 mg over 7 days. Despite these compiling factors, the CHD supported substantial wound fill and granulation resulting in a 92% reduction in wound area within 4.5 weeks (7.0 x 6.0 cm Day 0; 1.7 x 2.0 cm Week 4.5). Although follow-up was interrupted by extended travel, the wound remained stable and continued to progress without complication (Figure 3).

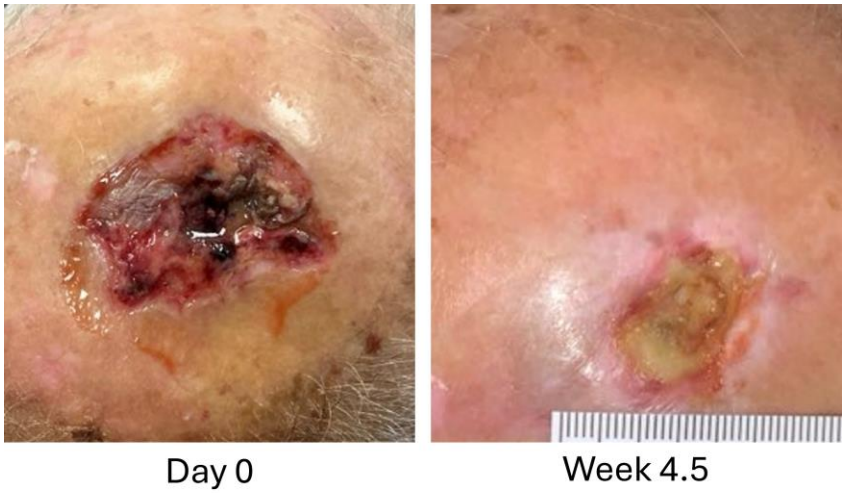

Figure 3. Healing progression of Patient C's fall-related injury. At baseline (Day 0), the wound measured 7.0 x 6.0 cm. Significant granulation and epithelization achieved by Week 4.5.

Together, these cases illustrate that the CHD can promote rapid wound bed preparation, early granulation, and steady healing in traumatic wounds, even in patients with significant comorbidities or treatment interruptions.

Discussion

Traumatic wounds are often irregular, contaminated, and slow to heal, with closure times depending on type of injury, wound size, presence of local complications, and underlying patient comorbidities [1,2]. Traditional approaches such as NPWT, delayed closure, or grafting can provide coverage but are associated with high costs, donor site morbidity, or the need for intensive follow-up [3].

In this case series, the CHD supported rapid granulation tissue formation and volume restoration, creating a stable foundation for continued healing. These early improvements were observed across patients with widely different profiles, including young, otherwise healthy individuals and elderly patients with significant comorbidities. One patient achieved complete closure within six weeks, another discontinued the CHD at Week 3 after expressing satisfaction with wound appearance, and a third continued to heal quickly despite travel-related gaps in follow-up. These experiences highlight the ability of the CHD to adapt to diverse patient needs while maintaining consistent early healing.

A key feature of the CHD is its ability to maintain a clean wound environment. In traumatic wounds that are highly susceptible to contamination, this stability is essential for granulation and progression toward closure. By supporting the wound microenvironment through the controlling bacteria and MMPs and promoting tissue regenerative growth factors, the CHD fosters optimal conditions for healing, reducing the need for more invasive interventions [16-18].

Equally important, the CHD was dispensed for at-home use, allowing patients to apply the dressing independently or with minimal assistance outside of the clinic or hospital. This reduced the burden of frequent clinic visits, home health visits, and provided a practical option for patients facing mobility challenges or travel constraints. For trauma patients, the

combination of clinical efficacy and simplified at-home use is especially valuable. From a healthcare system perspective, the CHD represents a cost-conscious alternative that offers both patient-centered and economic advantages. The cost of treating traumatic wounds can range from a few hundred to tens of thousands of dollars, depending on severity.[23] The CHD is insurance-reimbursed under HCPCS Code A6021 (collagen dressing) with a Medicare DME reimbursement rate of $29.30 per unit. Many patients have full coverage, resulting in no out-of-pocket costs. For those with a financial responsibility, the amount represents a fraction of the total cost.

Taken together, these findings suggest that the CHD supports rapid wound stabilization, early granulation, and practical models of care delivery that align with the realities of trauma patients. Future large-scale prospective studies are warranted to validate these preliminary findings, elucidate the therapeutic role of the CHD, and inform standardized protocols for its use in acute trauma management.

Conclusion

This case series highlights the potential of the CHD as a patient-centered approach to managing traumatic wounds at home. Across diverse patient scenarios, the CHD supported visible early healing, reduced treatment burden, and adapted to real-world needs. These findings suggest that integrating advanced wound care like the CHD can offer clinically meaningful benefits by combining accelerated healing with accessibility, affordability, ease of use, and improved quality of life.

References

1. Nicolai T, Moldovan A, Thoma C. (2024). Wound microbiology and infection. *Nat Rev Microbiol*.
2. Grice EA, Harding KG. (2024). Wound healing: Mechanisms, clinical applications, and challenges. *Clin Exp Dermatol*. 49(4):325-336.
3. Zarei Chamgordani N, Sayed Tabatabaei M, Mortazavi SM, Moghimi HR. (2023). An overview of wound healing: Wound types and current therapeutics. In: Bioengineered nanomaterials for wound healing and infection control. *Amsterdam: Elsevier*; p. 29-56.
4. Li D, Sun H, Jiang L, et al. (2014). Enhanced biocompatibility of PLGA nanofibers with gelatin/nano-hydroxyapatite bone biomimetics incorporation. *ACS Appl Mater Interfaces.* 2014;6(12):9402-9410
5. Pezeshki-Modaress M, Rajabi-Zeleti S, Zandi M, et al. (2014). Cell-loaded gelatin/chitosan scaffolds fabricated by salt-leaching/lyophilization for skin tissue engineering: in vitro and in vivo study. *J Biomed Mater Res A.* 102(11):3908-3917.
6. Pezeshki-Modaress M, Mirzadeh H, Zandi M. (2015). Gelatin-GAG electrospun nanofibrous scaffold for skin tissue engineering: fabrication and modeling of process parameters. *Mater Sci Eng C Mater Biol Appl.* 48:704-712.
7. Sell SA, Wolfe PS, Spence AJ, et al. (2012). A preliminary study on the potential of Manuka honey and platelet-rich plasma in wound healing. *Int J Biomater*. 313781.
8. Gasparrini M, Afrin S, Forbes-Hernández TY, et al. (2018). Protective effects of Manuka honey on LPS-treated RAW 264.7 macrophages. *Food Chem Toxicol.* 120:578-587.
9. Johnston M, McBride M, Dahiya D, Owusu-Apenten R, Nigam PS. (2018). Antibacterial activity of Manuka honey and its components: an overview. *AIMS Microbiol.* 4(4):655-664.
10. Minden-Birkenmaier BA, Bowlin GL. (2018). Honey-based templates in wound healing and tissue engineering. *Bioengineering (Basel).* 5(2):46.
11. Okabayashi R, Nakamura M, Okabayashi T, et al. (2009). Efficacy of polarized hydroxyapatite and silk fibroin composite dressing gel on epidermal recovery from full-thickness skin wounds. *J Biomed Mater Res B Appl Biomater*. 90(2):641-646.
12. Vilardell AM, Cinca N, Jokinen A, et al. (2016). Real-time protein and cell binding measurements on hydroxyapatite coatings. *J Funct Biomater.* 7(3):23.
13. Kawai K, Larson BJ, Ishise H, et al. (2011). Calcium-based nanoparticles accelerate skin wound healing. *PLoS One.* 6(11):e27106.
14. Rodriguez IA, Sell SA, McCool JM, et al. (2013). A preliminary evaluation of lyophilized gelatin sponges enhanced with platelet-rich plasma, hydroxyapatite and chitin whiskers for bone regeneration. *Cells;*2(2):244-265.
15. Majeed AA, Al Naimi RA. (2012). Role of hydroxyapatite in healing of experimentally induced cutaneous wound in rabbits. *Iraqi J Vet Sci.* 26(1):41-47.
16. Williams M, Rodriguez I, Strombergsson A, Fabbri S, Westgate S. (2021). A novel bioengineered wound product with in vitro capabilities to reduce bacteria. *Biomed Transl Sci.* 1(1):1-3.
17. Rodriguez I, Conti T, Bionda N. (2021). Microenvironment influence of a novel bioengineered wound product, APIS®: a preliminary in vitro analysis of inflammatory marker and growth factor secretion. *Int J Biomater.*:6612870.
18. Rodriguez I, Conti T, Bionda N. (2022). A preliminary direct comparison of the inflammatory reduction and growth factor production capabilities of three commercially available wound products. *Int J Mol Sci*. 23(18):10670.
19. Rodríguez I, Alvarez A, Massey C, et al. (2023). Novel bioengineered collagen with Manuka honey and hydroxyapatite sheet for treatment of lower extremity chronic wounds in an urban hospital wound care setting. *Wounds*. 35(1): E35-E38.
20. Rodriguez IA, Strombergsson A, Weinstein R, et al. (2023). Preliminary clinical evaluation using a novel bioengineered wound product to treat lower extremity ulcers. *Int J Low Extrem Wounds*. 22(1):139-145.
21. McMurray SL, Wallace MM, Stebbins WG, Clayton AS. (2021). Use of a novel biomaterial to enhance secondary intention healing. *Dermatol Surg*. 47(6):843-844.
22. Arnaud K, Wallace MM, Wheless LE, Stebbins WG, Clayton AS. (2023). Novel biomaterial containing gelatin, Manuka honey, and hydroxyapatite enhanced secondary intention healing versus standard secondary intention healing in Mohs surgical defects: randomized controlled trial. *Dermatol Surg*. 49(12):1160-1164.
23. Fife CE, Carter MJ. (2012). Wound Care Outcomes and Associated Cost Among Patients Treated in US Outpatient Wound Centers: Data From the US Wound Registry. Wounds. 24(1):10-17.

DOI:10.31579/2690-4861/977