

Topical Honey for Scalp Defects: An Alternative to Surgical Scalp Reconstruction

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Summary: This case report discusses the use of medical-grade honey as solitary treatment for a large scalp defect due to surgical excision of necrotizing fasciitis. Honey promoted granulation and epithelialization over bare bone, which has been previously undocumented in the literature. We discuss the proposed mechanisms of honey as a wound-healing agent and the evidence for its use, and we propose that honey may be considered a therapeutic option for scalp wounds—especially in patients who are poor surgical candidates. (*Plast Reconstr Surg Glob Open* 2015;3:e393; doi: 10.1097/GOX.0000000000000361; Published online 8 May 2015.)

CASE REPORT

Our patient is a 45-year-old man with a history of diabetes and recurrent soft-tissue infections who presented to the emergency department with necrotizing fasciitis of the scalp following a shaving injury. The patient was taken to the operating room where 2 distinct areas of scalp were excised down to bone, measuring 10×5 cm and 2×2 cm. There were no surgical complications, and the patient was discharged on postoperative day 3. Final culture data revealed *Staphylococcus aureus*. The patient was discharged on oral clindamycin for 10 days and wet-to-dry dressing changes 3 times daily. Definitive reconstruction was delayed.

Seven weeks postoperatively, the patient demonstrated a persistent right paramedian scalp defect measuring 6.4×3.0 cm with exposed, desiccated bone and a smaller defect measuring 1.3×1.3 cm. Both defects had contracted significantly, and the margins

had epithelialized down to bare bone with no signs of infection (Fig. 1). At that time, reconstruction options were discussed, including large rotation-advancement flaps. However, because the patient was considered a poor surgical candidate due to his history of poor wound healing and recurrent infections, the decision was made to proceed with medicinal honey dressings. He was instructed to apply medical-grade Medihoney (DermaSciences, Princeton, N.J.) twice daily and cover with a nonstick dressing.

After 2 weeks of honey dressings, the larger defect was unchanged but the smaller defect had contracted to 1×1 cm. Medihoney was continued. At 3 months postoperatively, the smaller defect had decreased to 0.6×0.7 cm, and the larger defect was stable in size at the periphery, but had begun to develop bridging granulation tissue in the wound bed (Fig. 2). At 5 months postoperatively, the smaller defect had healed and completely epithelialized, and the larger defect had decreased in size to 3.8×2.0 cm. There was significant contraction and robust granulation at the periphery (Fig. 3). At this time, the patient was felt to have an excellent prognosis, and need for surgery was no longer anticipated. At 9 months postoperatively, the larger defect was completely covered by granulation tissue with near-complete epithelialization and no exposed bone (Fig. 4). At no point in the follow-up was debridement of the wound or other intervention necessary, and he tolerated the dressings well throughout treatment.

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Fig. 1. Scalp wounds created by excision of necrotizing fasciitis at postoperative week 7, measuring 6.4×3.0 cm and 1.3×1.3 cm.

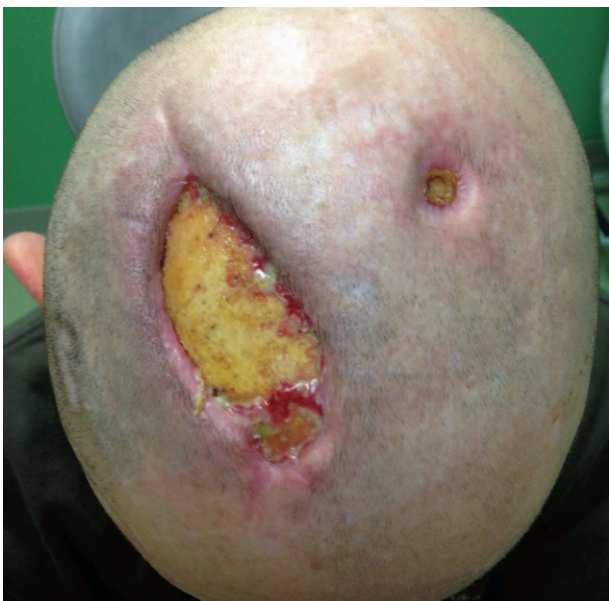


Fig. 2. Scalp wounds after 1 month of honey dressings, demonstrating development of granulation tissue at the wound periphery and measuring 6.4×3.0 cm and 0.6×0.7 cm.

DISCUSSION

Honey has a long history of use in wound healing, dating back to ancient times. More recently, antibiotic resistance and a renewed interest in alternative therapies have prompted reinvestigation of the use of honey as a wound-healing agent. Honey has been cited to have many positive effects on wounds, including bactericidal activity and promotion of wound granulation and epithelialization.¹ Honey's antimicrobial mechanisms remain poorly understood, though proposals include hydrogen peroxide-mediated mechanisms, arrest of bacterial cell cycle progression, flavonoid-mediated antioxidant activity, alteration of wound acidity, and osmotic activity.²⁻⁴



Fig. 3. Scalp wounds after 3 months of honey dressings, with full epithelialization of the smaller defect and robust granulation of the larger defect, now measuring 3.8×2.0 cm.



Fig. 4. Scalp wounds after 7 months of honey dressings, now demonstrating complete granulation of the larger defect with almost complete epithelialization and no remaining exposed bone.

One study even demonstrated outstanding results with the use of honey against *S. aureus* and *Pseudomonas aeruginosa* biofilms when compared with traditional antibiotics.¹

Honey has also been shown to have good wound-healing activity, and it has recently been postulated that honey may positively influence 3 phases of wound healing (inflammatory, proliferative, and remodeling), including immunologic modulation via increased production of cytokines, as well as pro-

motion of tissue granulation and epithelialization.^{2,3} One randomized controlled trial demonstrated the desloughing properties of Manuka honey in venous leg ulcers and its superior ability to promote healing over a more traditional hydrogel therapy—a finding supported by our patient, who required no debridement of his wound over the treatment period.⁵

There has been limited but increasing evidence to support the use of honey in burns, traumatic wounds, infected surgical wounds, pressure ulcers, and lower extremity ulcers.² Only one randomized controlled trial has examined the use of honey in head and neck wounds, specifically patients with free tissue transfer for head and neck cancers.⁶ This study found no significant difference in infection rates between honey dressings and conventional dressings, but patients with honey dressings had a significantly shorter hospital stay. Despite these promising findings, there are few randomized controlled trials to support the use of honey in clinical practice, and its role remains controversial. The most current review of the available data advises against the routine use of honey in wound care, citing the lack of studies and the generally poor quality of those that are available.⁷

We believe that our case is unique in that the alternative treatment would have involved a large surgical reconstruction. In our case, honey provided outstanding results for a patient in whom surgical treatment might have done more harm than good. Tissue expanders were not a reasonable option due to his high risk for infection, and formal reconstruction performed with large flaps posed serious risks considering his history of infection and poor wound healing. For these reasons, this patient was an excellent candidate to pursue alternative treatments, such as honey. At around \$27 USD for a 50-g tube of Medihoney Antibacterial Medical Honey, this treatment also presents a substantially more cost-effective strategy than surgical treatment.

Perhaps the most intriguing aspect of this case is that healing occurred on the surface of bare bone with absent periosteum. We postulate that honey may cause changes on bare bone that facilitate granulation tissue formation. We are currently

investigating the feasibility of studying this formally in the laboratory.

This case represents only the third report on the use of honey in a scalp wound.^{8,9} This may also be the first documented case in which honey has been used to achieve healing over bare bone. Honey should be considered an alternative therapy in those patients with head and neck wounds, particularly wounds of the scalp, who are poor surgical candidates, who fail other topical therapies, or who wish to try more conservative approaches to treatment.

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