

Unleashing the Power of Copper:

Reducing Chronic Inflammation and Biofilm Formation for Effective Wound Healing

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INTRODUCTION

- The presence of bacteria in wounds can lead to infections that impede healing. Infected wounds often require more intensive treatment and can lead to further complications such as increased pain, inflammation, and ultimately, a higher likelihood of requiring surgical intervention.
- Persistent inflammation can create a hostile environment for healing, as it may lead to tissue damage and inhibit the normal healing processes. Chronic inflammation is often linked with the persistence of biofilms.
- Given the significant barriers posed by infection and inflammation, there is a pressing need for innovative wound dressings that can effectively tackle these problems. Copper-based dressings have emerged as a promising solution due to their unique properties:
- Copper has demonstrated the ability to break down biofilms, which is critical for reducing bacterial load in wounds.
- Copper's anti-inflammatory properties can help mitigate chronic inflammation at the wound site.
- By addressing both infection and inflammation, copper-based dressings can promote better healing outcomes. This includes faster wound closure and improved overall recovery for patients with chronic wounds.
- Unlike some other antimicrobial agents, copper dressings have shown a favorable safety profile, with minimal risk of adverse effects or sensitivities. This makes them suitable for a wide range of patients, including those with chronic wounds that have proven difficult to heal with traditional methods.

METHOD

- All three patients have chronic wounds that have stalled in their healing process.
- Each wound exhibits signs of biofilm and inflammation, which are indicative of persistent infection and complicate the healing process.
- The treatment protocol includes changing the dressings two to three times a week, depending on the amount of exudate. This frequency helps manage moisture levels and prevents infection while promoting an optimal healing environment.
- When clinically indicated, sharp debridement is performed in the outpatient wound clinic.
- The combination of chronic wounds, comorbidities, biofilm presence, and the need for frequent dressing changes and debridement underscores the complexity of each patient's healing journey.

REPRESENTATIVE CASES

Case 1

- A 77-year-old female presented with an infected hematoma that necessitated surgical debridement and the application of negative pressure wound therapy (NPWT). Copper treatment was initiated upon completion of NPWT. Observations indicate a reduction in erythema and inflammation corresponding with the wound's healing progress. No signs of re-infection have been observed following the commencement of copper therapy.



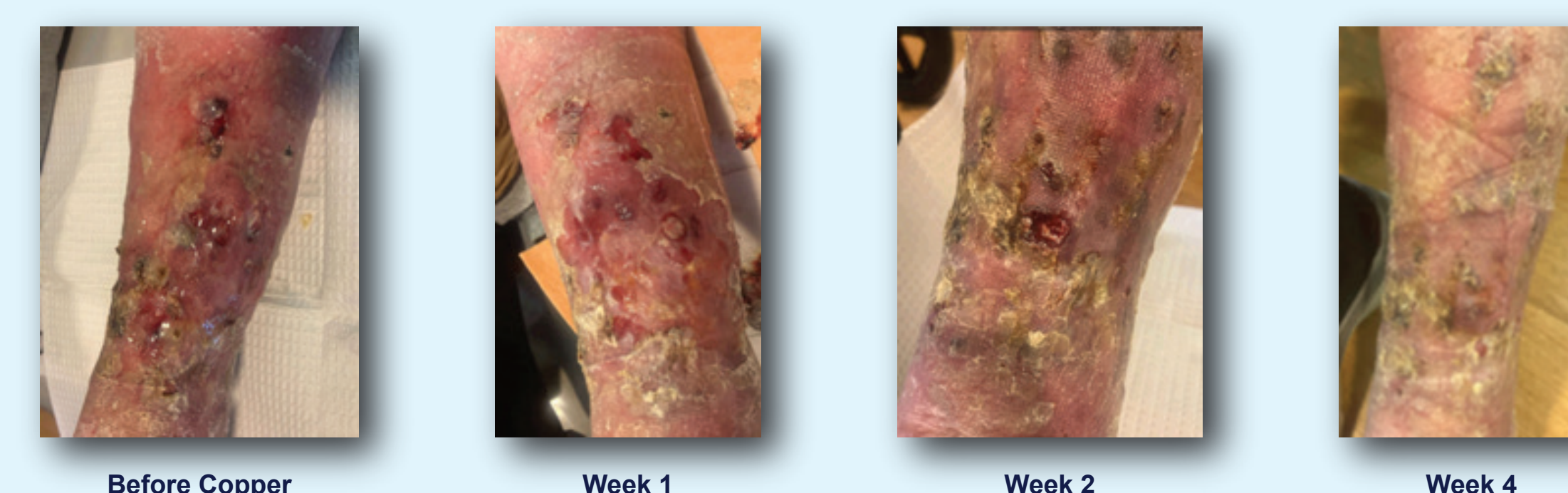
Case 2

- A 52-year-old woman presented with an open venous ulcer located on a prior surgical scar. After six months of unsuccessful treatment using silver and foam, she began a regimen of copper alginate. This new treatment resulted in decreased pain and inflammation and reduction in biofilm which eradicated the need for serial debridement. Ultimately, the wound achieved complete closure after six weeks of copper alginate and compression therapy.



Case 3

- A 72-year-old female presented with chronic venous leg ulcers. Following the initiation of copper therapy and compression treatment, the inflammatory response diminished, fluid levels were effectively managed, biofilm was reduced, and superficial areas healed within two weeks. Ultimately, all ulcers were closed within one month.



RESULTS

- Clinical signs of biofilm formation and inflammation were significantly reduced or completely eliminated, indicating that the treatment effectively targets both infection and the associated inflammatory response.
- Regular assessments revealed a consistent progression in wound healing, evidenced by smaller wound measurements and improved evaluations of the wound and surrounding tissue. This suggests that the treatment not only addresses the infection but also promotes tissue regeneration.
- Patients reported experiencing less pain and inflammation at the wound site, which is a crucial factor in their overall recovery and quality of life.
- The absence of adverse effects or sensitivities among patients using copper dressings further supports the safety and tolerability of this treatment modality.

DISCUSSION

- Copper is essential for tissue health and skin integrity. Its presence in the dressing contributes to promoting cellular function and regeneration.
- The unique mechanism of copper in these dressings helps disrupt bacterial cell walls, which is crucial in preventing the formation of harmful biofilms that can hinder healing.
- Copper dressings effectively manage inflammation in the wound area, creating an optimal environment for healing. This is particularly important for chronic wounds where inflammation can be a persistent issue.
- Patients who previously tried various dressings without significant improvement experienced positive changes after switching to copper alginate dressings. This highlights the potential of copper dressings in treating difficult cases of chronic wounds.
- Unlike silver dressings, which can sometimes cause skin sensitivity or adverse effects, copper dressings have shown a favorable safety profile. This makes them a viable option for patients with chronic wounds who may be at risk for sensitivity reactions.
- Analyzing various clinical cases provides valuable insights into both the benefits and limitations of using copper dressings. While they offer significant advantages, it's important to consider individual patient needs and responses to treatment.
- The findings from these cases can help guide healthcare providers in making informed decisions about wound care strategies, especially for patients with complex healing needs.
- The introduction of copper alginate dressing marked a pivotal moment in the treatment of these patients, suggesting that innovative approaches in wound management can lead to improved outcomes.