Chronic Wound Healing:

The Essential Role of Copper-Based Dressing in Innovative Care

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INTRODUCTION

- Effective and affordable treatment options are crucial for healing chronic wounds.
- Copper alginate-based dressings have emerged as a novel solution for wound care.
- Copper possesses unique properties that support wound healing and as an alternative to traditional antimicrobial agents like silver and iodine.
- Copper is an essential trace mineral critical for the proper functioning of body tissues offering a more natural option with fewer to no adverse effects or sensitivities.

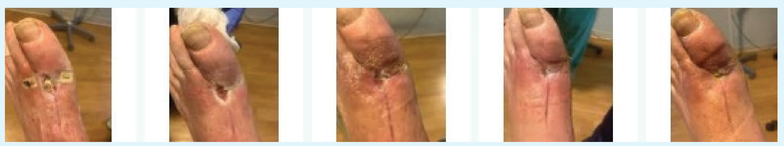
METHODS

- Application in the outpatient wound center:
  - Copper alginate dressings were introduced for chronic, non-healing wounds.
  - Specifically targeted wounds stalled in the inflammatory phase, particularly those with clinical signs of biofilm formation and infection.
- Versatility:
  - The dressing is also used for a range of other treatments, including burns and postoperative incisions.

RESULTS

- Stalled wounds began progressing through the normal phases of healing.
- Less frequent need for sharps debridement in the clinical setting.
- Dressing changes are easy and able to be performed by patient or caregiver in the home setting.
- No adverse effects or sensitivities reported.

- ***Patient Details:***
  - 60 year old male
  - Type 2 diabetes (important for wound healing considerations)
- Surgical Procedure:
  - Hallux rigidus surgery with the implantation of a 1st MPJ.
- Post-Operative Management:
  - Copper added at the completion of NPWT, to help reduce infection risk and promote healing, given its known antimicrobial properties and effects on tissue repair.
- Outcome and Progress:
  - No infection occurred during the post-operative course while utilizing copper.
  - Weekly monitoring showed continued progress of the wound bed and surrounding tissue, suggesting successful healing.
  - Copper therapy was continued until complete healing was achieved.
- Given that the patient has diabetes, it's important to note that healing in diabetic patients can be delayed, so the lack of infection and positive tissue progress here are particularly encouraging. Copper's role in enhancing collagen synthesis, promoting angiogenesis, and its antimicrobial properties likely contributed to the positive outcome.



Week 1 | Week 3 | Week 4 | Week 5 | Week 6

- Redness and inflammation of the wound and peri-wound decreased in the first week of use.
- Patients reported decreased wound pain during follow-up clinic visits.
- Infrequent dressing changes (1-3 times weekly, based on exudate).
- A significant decrease in infection rates was observed during copper dressing use.

- ***Patient Details:***
  - 81 year old female
  - Hypertension
  - Arthritis
  - Spinal Stenosis and Spondylosis
  - Anxiety and Depression
- Previous Cultures:
  - MRSA (Methicillin-resistant Staphylococcus aureus) and Pseudomonas species (both of which are common in chronic wound infections).
- Management and Treatment:
  - Antibiotic Therapy:
    - Oral antibiotics were started based on the identification of MRSA and Pseudomonas, indicating a targeted approach to address the infection.
  - Copper Dressing:
    - Copper-based dressings were introduced, for their antimicrobial properties.
- Wound Progress:
  - Erythema (redness), pain, and wound measurements all decreased over time, suggesting a positive response to treatment. This indicates that the infection was controlled, and the healing process was progressing well.
  - Full Healing Achieved: Ultimately, the wound completely healed, which is a positive outcome, especially given the patient's age and underlying health issues.

Before Copper | Week 3 | Week 5

DISCUSSION

- Significant improvements in chronic wound healing including reduced healing time.
- Antimicrobial Action:
  - Electrostatic penetration of bacterial cell membranes.
  - Prevention of bacterial replication.
  - Disruption of biofilm.
  - Prevention of infection.
- Outperforms silver dressings.
- Anti-inflammatory Effects:
  - Reduction of inflammation by lowering pro-inflammatory cytokines and growth factors.
- Promotion of Tissue Regeneration:
  - Promotion of pro-angiogenic factors for new blood vessel formation.
  - Enhancement of dermal fibroblast activity.
  - Acts as a cofactor for lysyl oxidase, linking collagen and elastin in the extracellular matrix.
- Safety and Usability:
  - Non-irritating and non-sensitizing unlike its silver counterpart.
  - Available in various easy-to-apply forms.
  - Indicated for all wound types excluding third degree burns.
- Limitations:
  - Current limitations are still being identified.

Trademark- *MedCu Copper

Abstract References:

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