

CASE REPORT

Role of Topical Cholecalciferol Granules in the Recovery and Management of Thermal Burns

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ABSTRACT

Thermal burns present many challenges in wound healing and management due to extensive tissue damage and a high risk of infection, which can delay recovery. Such wounds often exhibit deficiencies in essential chemokines and growth factors, necessitating external supplementation to support healing. This article explores the potential role of topical cholecalciferol (vitamin D3) in managing thermal burn wounds. **Materials and Methods:** This case report describes the treatment of a 46-year-old male with a thermal burn on the face, neck and right upper limb extending from the hand to mid arm level. The wound exhibited signs of delayed healing despite standard care. Topical cholecalciferol was applied during routine dressing changes, and the wound's progress was monitored over two weeks. **Results:** The wound demonstrated significant improvement, with visible evidence of healing and appearance of granulation tissue and epithelisation. **Conclusion:** Topical cholecalciferol shows promise as an adjunct therapy for enhancing wound healing in thermal burns. However, further studies involving larger patient populations are needed to validate its clinical effectiveness.

KEYWORDS

• Thermal burns • Wound healing • Topical cholecalciferol • Burn management • Infection control • Delayed healing • Growth factors • Case report • Granulation tissue • Adjunct therapy • Cholecalciferol • Thermal Burns • Wound Management

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INTRODUCTION

Wound bed preparation has emerged as a pivotal approach to accelerate wound healing, focusing on infection control and supplementation of growth factors. Several modalities, such as autologous platelet-rich plasma (APRP), platelet-rich fibrin matrix (PRFM), topical insulin, and prolotherapy, have been explored to enhance wound healing. Recently, the use of topical cholecalciferol (vitamin D3) has shown potential in wound management. This case report highlights the application of topical cholecalciferol in managing a residual raw area following thermal burns in a single patient.

METHODOLOGY

This study was conducted in the Department of Plastic Surgery at a tertiary care center with approval from the departmental ethics committee. Written informed consent was obtained from the patient. The case involved a 46-year-old male with no significant comorbidities, presenting with a history of accidental thermal burns sustained from an oven. The patient developed a residual raw area on the face, neck and right upper limb (Figure 1a, 1b and 1c) after initial debridement and standard wound care failed to achieve healing.



Figure 1a



Figure 1b



Figure 1c

Topical cholecalciferol granules (figure 2) were applied to the wound following debridement. A regenerative scaffold was placed over the application site, and dressings were changed every two days. This regimen was repeated over two weeks, with a total of five applications of topical cholecalciferol.



Figure 2

RESULT

The wound exhibited progressive improvement, with the development of healthy granulation tissue within the first week. By the end of two weeks, the wound bed showed significant healing, with reduced inflammation and improved epithelialization.

DISCUSSION

Burn injuries, particularly thermal burns, pose a significant challenge due to prolonged healing times and increased risk of infection. Although advancements in burn care have reduced mortality rates, delayed wound healing remains a major concern. Thermal burns often result in tissue necrosis, loss of vascularity, and an increased inflammatory response, necessitating interventions to promote healing.

Vitamin D, particularly in its active form (cholecalciferol), plays a critical role in calcium homeostasis and immune modulation. Topically applied cholecalciferol granules have shown to enhance keratinocyte migration, increase chemokine production (e.g., IL-8), and promote the synthesis of antimicrobial peptides such as defensins and cathelicidins. These properties contribute to improved wound healing by reducing inflammation and promoting epithelialization.^{1,6,7}

Cholecalciferol has also been studied for its effectiveness in healing diabetic wounds and corneal wounds, demonstrating its potential in chronic wound scenarios.^{5,6} Moreover, topical antimicrobial delivery systems such as gentamicin in collagen dressings and minocycline in chitosan-polyurethane foams have proven effective in wound care.^{2,4} This case further supports the utility of cholecalciferol granules as an adjunctive therapy for wound management.

CONCLUSION

Topical cholecalciferol appears to be a promising adjunctive therapy for managing residual raw areas in thermal burn wounds. However, this case report represents a single

patient experience. Larger, population-based studies are needed to validate these findings and determine the broader clinical applicability of cholecalciferol in wound care.

Conflicts of interest: None.

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