

Managing Pressure Injuries with Exposed Tendon in a T2DM Female with GELFEEL Hydrogel Dressing Based on Carboxymethyl Chitosan: A Chronic Case Report

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1. Abstract

1.1. Background: Due to chronic disease, patients with impaired wound healing capacity require optimized wound dressings and antiseptic treatments. GELFEEL hydrogel dressing based on carboxymethyl chitosan is an ideal product for chronic wound management and treatment that takes as a skin barrier and supports the wound healing process.

1.2. Case: A 74-year-old female with T2DM got a pressure injury. Initial conventional treatment and management was unsuccessful with persistent deterioration and infection, resulting in wound deterioration and tendon exposure. The wound was subsequently treated with GELFEEL hydrogel dressing based on carboxymethyl chitosan. As the treatment progresses, the wound healed gradually and eventually showed satisfactory healing condition.

1.3. Discussion: Prolonged or severe pressure can affect the normal flow of blood and oxygen supply, which caused the skin necrosis and refractory wound. GELFEEL hydrogel dressing based on carboxymethyl chitosan is very suitable for such chronic wound. It can dissolve necrotic tissue, create a hypoxic environment and promote capillary angiogenesis, decrease pain and injury associated with dressing changes, and actively fight infection.

1.4. Conclusion: Due to aging, there is an urgent need for ideal treatment and management of chronic skin wounds caused by prolong sitting or lying. We highlight this case to raise awareness

of this injury and timely management to reduce strains on health systems and financial burden on patients.

2. Introduction

Population ageing is occurring alongside broader social and economic changes taking place throughout the world, which introduces a high risk of pressure injuries due to prolonged prone positioning [1]. For skin already compromised (a pressure ulcer has developed), they will occupy clinician time and hospital resources for months. GELFEEL hydrogel dressing based on carboxymethyl chitosan is an example for both prevention and management of patients with at-risk skin or with an already developed pressure injury. This case report has shown the clinical symptoms, objective findings, and outcomes of pressure injury management for one T2DM female using GELFEEL hydrogel dressing based on carboxymethyl chitosan.

3. Case Report

A 74-year-old female with T2DM was referred to the hand and foot surgery due to refractory and infectious pressure ulcers after having right lower limb weakness from stroke dating about four weeks prior to initial presentation. There was a history of routine disinfection and care used, showing no effect and profit but deterioration of the wound on the village public health center prior to admission. A thorough history about the mechanism of injury was taken. The patient had controlled T2DM (HbA1c, 5.8%; fasting blood glucose level, 6.20 mmol/L), cerebral infarction and wound infection.

Upon examination, there was a 40mm×40mm and 30mm×30mm dumbbell-shaped wound with necrotic tissue covering the right lower extremity. Subcutaneous tissue and achilles tendon were apparent, with foul-smelling discharge, which part of the tendon was dry necrosis. Clinical symptom of infection was observed, with multiple bacterial infections (staphylococcus epidermidis, candida albicans) (Figure 1A).

Debridement was performed with appropriate hemostasis (outpatient setting). After thorough irrigation with normal saline solution, iodine and hydrogen peroxide was used as skin cleanser. GELFEEL hydrogel dressing based on carboxymethyl chitosan (30mm×60mm) was selected to manage the chronic and infection wound. Seven days after debridement and dressing management, the wound showed moderate exudation but granulation initiated and no additional necrosis. Epithelialization was noted on the edges of the wound (Figure 1B). Fourteen days after debridement, the necrotic tissue becomes limited. Considering swollen granulation tissue and necessary to remove necrotic tissue, treatment was changed to alternately use GELFEEL hydrogel dressing based

on carboxymethyl chitosan and sterile gauze. (Figure 1C). Twenty-one days after debridement, necrosis of the skin, subcutaneous tissue, and fascia appeared to have resolved, with increased granulation and limited infection (Figure 2D). Twenty-eight days after debridement, granulation tissue gradually replaced necrotic tissue and there was only minimal infection (Figure 2E). Treatment was continued. Thirty-five days after the initial consultation and debridement, the wound size had decreased (Figure 2F). Forty days after debridement, basal blood transport was abundant (Figure 2G). Fifty days after the initial consultation and debridement, the wound presented overall good status and there was no necessary for undergoing skin grafting (Figure 2H). The patient and the wound care team were highly satisfied with the alternating used of GELFEEL hydrogel dressing based on carboxymethyl chitosan and sterile gauze. The patient reported no pain during dressing changes when the GELFEEL hydrogel dressing based on carboxymethyl chitosan was employed.

Note: (A) pre-operative; (B) day 7 (post-operative); (C) day 14; (D) day 21; (E) day 28; (F) day 35; (G) day 40; (H) day 50.

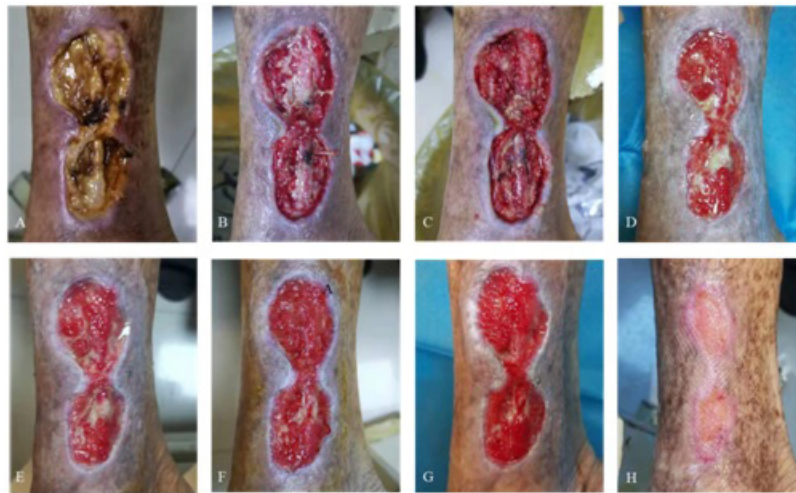


Figure 1: Time course of wound management with GELFEEL hydrogel dressing based on carboxymethyl chitosan and sterile gauze in an adult diabetic female with pressure injury.

4. Discussion

Affecting the normal flow of blood and leading to a decrease in oxygen supply to the skin and underlying soft tissue, pressure injuries are chronic wound caused by prolonged sitting and lying on the load-bearing area. More care for pressure injury should be invested to avoid higher costs and economic burden on the health care system [2].

Hydrogel dressings can be utilized for different presentations of pressure injuries that little or no excess fluid, necrotic or painful wounds and infected wounds. Chitosan is one of the natural polymers that represents good antimicrobial properties, non-toxic and most importantly, promotes wound healing [3]. Bio-based products usually have good biocompatibility.

GELFEEL hydrogel dressing based on carboxymethyl chitosan is

an example of such innovative product possessing features that make it good choice for chronic wound. GELFEEL hydrogel dressing based on carboxymethyl chitosan has antimicrobial and antibacterial abilities that alter the wound bed bioburden, which reduce infection and topical antibiotic usage. From the case, GELFEEL hydrogel dressing based on carboxymethyl chitosan can facilitate wound healing. It allows moisture vapour transmission, maintains oxygen supply to the skin as well as tissues under the skin and provides hospitable and moist environment for cells growing, which necrotic tissue in wound is expelled. However, the exudation on the patient's wound exceeded the absorptive capacity of the dressing. Alternate use of traditional gauze and dressing is a good strategy for managing chronic wounds with excessive exudate, which can not only improve the ability of GELFEEL hydrogel dressing based on carboxymethyl chitosan to handle exu-

date, but also assist in the removal of necrotic tissue. As changing gauze, necrotic tissue is easily removed to avoid the process of scalpel to remove necrotic tissue and further promote the ingrowth of new tissue. In addition, GELFEEL hydrogel dressing based on carboxymethyl chitosan tends to be less painful or show soothing effect.

5. Conclusion

The treatment and management of chronic wounds is an increasingly important problem. We highlight this case so that surgical clinicians have a good strategy to manage chronic wounds in prolonged sitting and lying patients presenting with similar symptoms and complaints.

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