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Case Report
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Healing of a Category IV Sacral Pressure Ulcer by a Special Wound Care Cream: A Case Report

*Bayrak Z[1], Ince M[2], Cirak E[1], Yilmaz MI[3], Tanyuksel M[4], Yaman H[4]**

[1]Research Center, Phytocenter, Ankara, Turkey

[2]Division of General Surgery, Ozel 100. Yil Hospital, Ankara, Turkey

[3]Division of Nephrology, Center for Epigenetic Health Solutions, Ankara, Turkey

[4]Division of Wound Care, ZGHolistic Clinic, Ankara, Turkey

Abstract

Background: Pressure Ulcers (PUs) are injuries to the skin and underlying tissues that occur most commonly over bony prominences, such as the hips and heels because of pressure and shear forces. PUs cause pain, discomfort, longer hospital stays and decreased quality of life. They are also very costly to treat and consume substantial parts of healthcare budgets. Wound healing is a complex process characterized by inflammation, proliferation, repair, and remodeling stages. A Special Wound Care Cream (SWCC) improves wound healing.

Aim: We observed the use of SWCC to determine its effectiveness in the management of chronic wound healing following surgical debridement. In this report, the use of SWCC application with debridement in a Category IV Sacral Pressure Ulcer is detailed.

Method: A 74-year-old male presented with a category IV pressure ulcer in the sacral region after 17 days of lying in the intensive care unit due to COVID-19 and treated with standard wound care. He is suffering from type II diabetes mellitus. First, a major surgical debridement was performed to treat a pressure ulcer in the sacral region. All the necrotic tissues were removed. Afterwards, daily localized small surgical debridement was performed, and the wound bed was cleaned by irrigation of the wound surface with gauze and saline. Then SWCC was applied to the wound area and covered with gauze.

Results: SWCC treatment after the major surgical debridement has produced the most dramatic changes in all dimensions since the opening 24 weeks of therapy. Twenty-four weeks after the first cream application, the wound was filled with new tissue and completely closed. The wound was completely recovered with new epithelial formation.

Conclusion: The cream stimulates wound healing, increasing re-epithelialization, contraction, synthesis of collagen and angiogenesis. The cream provides the necessary chemical signals to support tissue regeneration.

Implication for clinical practice: The Special Wound Care Cream should be considered for wound healing and to reduce the negative impact on a patient's life after surgical debridement in burns of varying degrees and many chronic non-healing wounds.

Keywords: Granulation tissue; Re-epithelization; Pressure ulcers; Special wound care cream; Wound healing

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Correspondence:
Halil Yaman, Division of Wound Care, ZGHolistic Clinic, Mustafa Kemal Mh. 2129 Sk.06810, Ankara, Turkey, Tel: +90 312 2195477; Fax: +90 312 2195477

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Introduction

Pressure Ulcers (PUs) are defined as "localized damage to the skin and/or underlying tissue, usually over the bony prominence, as a result of pressure combined with pressure or shear" [1]. PUs are also known as bedsores or decubitus ulcers. In long-term nursing and hospital care, patients who cannot move and change position are at most risk of developing pressure ulcers. Risk factors include older age, cognitive impairment, immobility, body weight and medical comorbid conditions that affect soft tissue integrity and healing (such as severe pain, urinary incontinence, edema, infections, localized ischemia, hypoalbuminemia, diabetes, and poor nutrition) [2,3]. PU can damage not just the skin but also can spread to the underlying tissues, extended hospitalization, and lengthy treatment. They are often infected, sometimes causing septicemia and osteomyelitis. In

severe cases, the underlying muscle or bone can be destroyed and can be life-threatening [4]. They also lead to major financial consequences in the country's economy. Interventions to prevent the formation of pressure ulcers or reduce their severity can have significant health effects and may be more effective than treating ulcers after they have developed [2].

Various preventive interventions are available, including a variety of support surfaces, repositioning, skin care (including creams, dressings, and management of incontinence), and nutritional supplementation [5,6]. Wound healing is a complex process characterized by inflammation, proliferation, repair, and remodeling stages [7,8].

Angiogenesis, stimulation of secretion of fibrinogen, elastin and collagen by fibroblasts and their stabilization, matrix remodeling, cell proliferation and re-epithelization, migration of keratinocytes and stem cells are important for many wound healings [9]. Chemotaxis occurs in leukocytes and macrophages in wound field which are key mediators at different stages of wound healing as well as keratinocytes, vascular endothelial cells, chondrocytes and fibroblasts, which are cells responsible for tissue formation. This causes a reduction in inflammation and an increase in blood flow, which translates into a mode of action for wound healing [10]. Angiogenesis, synthesis of collagen and elastin, granulation formation, matrix remodeling, cell proliferation, and re-epithelization would be induced by the Special Wound Care Cream (SWCC) placed on the wound bed and with 2 capsules given orally. Royal Jelly (RJ) is a functional food. RJ has antioxidative activities that also scavenges superoxide anion, and hydroxyl radical. The major fatty acid component of RJ, 10-HDA, has been shown to have collagen synthesis-inducing, and MMP-inhibitory activities [11]. Kim et al. demonstrated that RJ enhanced the migration of human fibroblasts and increased the level of sphingolipids in an *in vitro* wound healing model [12]. RJ has also the ability to promote collagen production by inducing Transforming Growth Factor-β1 (TGF-β1) production [13]. Proanthocyanidins and other tannins in grape seed have an important role in wound healing by Vascular Endothelial Growth Factor (VEGF) release and stimulating angiogenesis [14].

This effective SWCC is made from carefully picked ingredients with nourishing and healing properties. More specifically, the SWCC is made with water, *Olea europaea* fruit oil, Beeswax, *Laurus nobilis* fruit oil, Sodium Borate, Ascorbic Acid, *Myrtus communis* leaf oil, *Hypericum perforatum* oil, *Pistacia lentiscus* Gum, Benzoic Acid and its sodium salt, *Nigella sativa* Seed oil, Tocopherol. This unique combination is to aid the healing of acute and chronic wounds and promote skin regeneration. The natural, medical grade ingredients of this cream are compatible with sensitive skin. The trade name of SWCC is Phytocenter Evergreen Cream. The SWCC is manufactured Zeheri Group Company, Ankara, Turkey. One of the capsules is Gunzum, a dietary supplement containing grape seed (Vitis vinifera), *Liquidambar orientalis*, Carob (*Ceratonia siliqua*). The other capsule is Royal Jelly containing ascorbic acid, lyophilized royal jelly. Both capsules are produced by Zeheri Group Company, Ankara, Turkey.

Here we report a case of a category IV pressure ulcer in the sacral region which showed dramatic improvement in wound healing following our treatment.

Case Presentation

A 74-year-old male presented with a category IV pressure ulcer in the sacral region after 17 days of lying in the intensive care unit due to COVID-19 and treated with standard wound care. He is also suffering from type II diabetes mellitus. He was receiving oxygen support due to respiratory distress. Besides a urinary catheter was inserted to him.

At his initial visit to the wound care clinic, pressure ulcer wound size was measured as 16 cm long × 11.5 cm wide before treatment. A black necrotic area was visible in the center of the wound and the periphery of the wound was hyperemic (Figure 1).

First, a major surgical debridement was performed to treat a pressure ulcer in the sacral region. All the necrotic tissues were removed. Prophylactic amoxicillin and clavulanic acid treatment was given for 10 days after surgical procedure. Afterwards, daily localized small surgical debridement was performed, and the wound bed was cleaned by irrigation of the wound surface with gauze and saline. Then SWCC was applied to the wound area and covered with gauze. Image of the wound 1 week after major surgical debridement. There were necrotic subcutaneous tissues. Following surgery, the wound had profuse fibrous tissue. There was obvious tunneling. The wound was measured as 16 cm long × 11.5 cm wide × 4.8 cm deep (Figure 2).

After 2 weeks of wound care, the soft and pink granulation tissue was prominently visible at the wound site. There were partial necrotic areas in the wound area. The wound margins became more intact. Tunneling was reduced. It was seen a reduction of the depth of the wound (Figure 3).

After 4 weeks, the soft and pink granulation tissue covered approximately 80% of the wound area. There were partial necrotic areas in the wound area. The wound margins were becoming more intact. Tunneling in the wound area was reduced further (Figure 4).

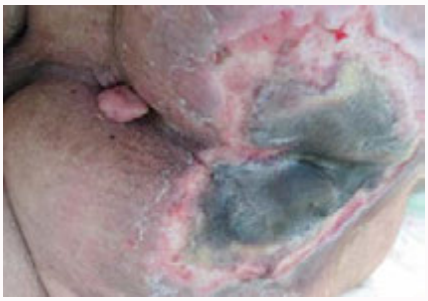

Figure 1: Wound appearance at initial wound care clinic visit. The wound was measured as 16 cm long × 11.5 cm wide. A black necrotic area was visible in the center of the wound and the periphery of the wound was hyperemic.

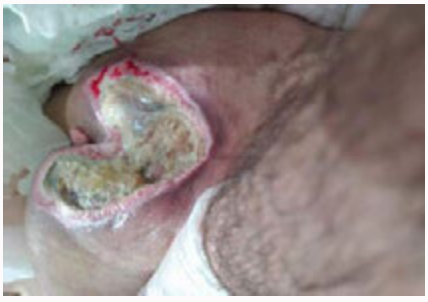

Figure 2: Week 1: Wound appearance after major surgical debridement. There was necrotic subcutaneous tissues and fibrin appearance on the wound. There was obvious tunneling. The wound was measured as 16 cm long × 11.5 cm wide × 4.8 cm deep.

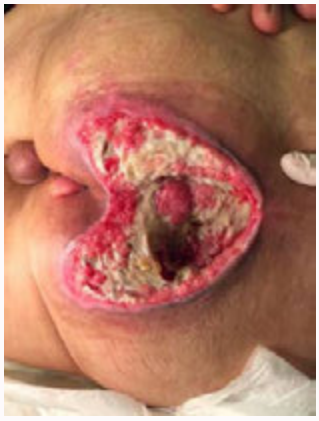

Figure 3: Week 2: The soft and pink granulation tissue was prominently visible at the wound site. There were partial necrotic areas in the wound area. The wound margins became more intact. Tunneling was reduced. It was seen a reduction of the depth of the wound.

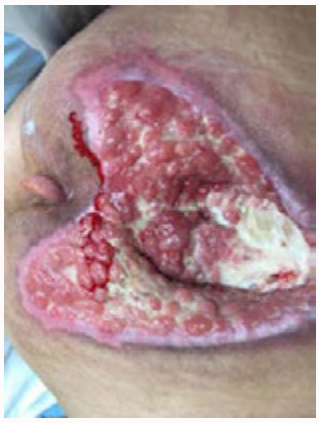

Figure 4: Week 4: The soft and pink granulation tissue covered approximately 80% of the wound area. There were partial necrotic areas in the wound area. The wound margins became more intact. Tunneling in the wound area was reduced further.

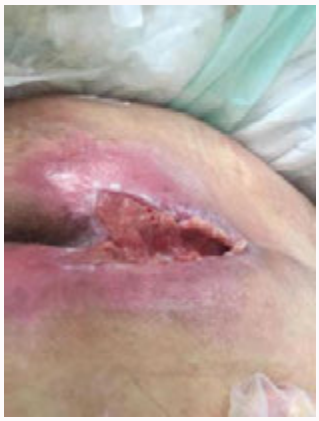

Figure 5: Week 8: There were no necrotic areas in the wound area. It was not observed any infectious findings. Re-epithelialization parts of the wound appeared pinkish. Granulation tissue significantly reduced tunneling. Wound depth was significantly reduced. The wound was measured as 11 cm long × 10.5 cm wide × 2.6 cm deep.

After 8 weeks, there were no necrotic areas in the wound area. It was not observed any infectious findings. Re-epithelialization parts of the wound appeared pinkish. Granulation tissue significantly reduced tunneling. Wound depth was significantly reduced. The wound was measured as 11 cm long × 10.5 cm wide × 2.6 cm deep (Figure 5).

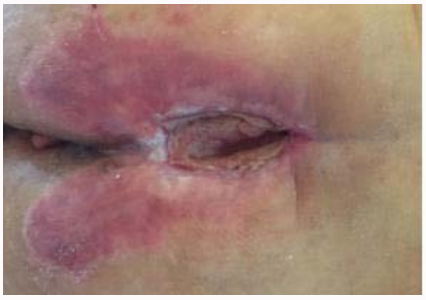

Figure 6: Week 12: Re-epithelialization area covered approximately 75% of the wound area. There were no necrotic areas and fibrin in the wound area. There was no tunneling. The wound was measured as 5.5 cm long × 9.5 cm wide × 1.7 cm deep.

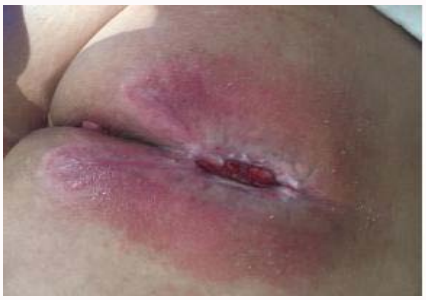

Figure 7: Week 17: There were no necrotic areas in the wound area. There was no tunneling in the wound area. The wound was measured as 2.4 cm long × 5.6 cm wide × 0.6 cm deep.

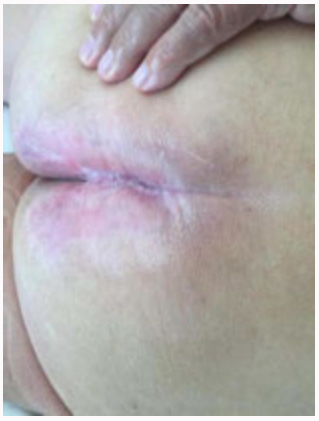

Figure 8: Week 24: The wound was filled with new tissue and completely closed. The wound was completely recovered with new epithelial formation (~100% reduction in wound volume).

Figure 6 shows the progression of the wound's dimensions over 12 weeks of treatment documented here. The wound experienced contracture in all dimensions, with the significant decreasing of the depth. The wound was measured as 5.5 cm long × 9.5 cm wide × 1.7 cm deep. Re-epithelialization area covered approximately 75% of the wound area. There were no tunneling and fibrin in the wound area.

After 12 weeks, the decrease in depth was substantial enough to incite changes in the other dimensions. There were no necrotic areas in the wound area. There were no tunneling in the wound area. The wound edges appeared narrower. The wound was measured as 2.4 cm

long × 5.6 cm wide × 0.6 cm deep (Figure 7).

SWCC therapy after the major surgical debridement produced the most dramatic changes in all dimensions since the opening 24 weeks of therapy. Twenty-four weeks after the first cream application, the wound was filled with new tissue and completely closed. The wound was completely recovered with new epithelial formation (~100% reduction in wound volume, Figure 8). There were no complications recorded in this wound treatment.

Before intervention, informed consent was obtained from the patient.

Discussion

We report a case of a category IV pressure ulcer in the sacral region who showed dramatic improvement in wound healing following our treatment. This case required especially quick wound management to avoid wound-related complications and to improve the patient's activities of daily living as well as his quality of life. This is the first study demonstrating the role of SWCC application to a category IV pressure ulcer in the sacral region, without any side effects.

Wound healing is a complex and dynamic process. Aggressive wound care, sharp debridement, infection control, restoration of circulation, negative pressure wound therapy and other basic approaches, often results in wound closure [9,15]. However, many chronic wounds fail to heal, and novel treatments are needed.

Before applying the cream, the wound was prepared by surgical debridement as required to remove any dead tissue and hyperkeratotic skin, then cleaned with saline solution each time. After cream application, wound was covered with a nonadherent sterile gauzes. A few layers of sterile gauze and non-compressible bandages were placed on the area of wound. Clinical evaluation of treatment outcome included assessment of ulcer size and extent of wound healing. Several early bedside sharp debridement was performed for the sacral wound without anesthesia, resulting in modest bleeding. The sacral wound was “wet” for the first 12 days, however, once the granulation tissue became evident, all minor capillary blood leakage ceased, and the wound was no longer wet. Two weeks after the wound treatment with cream application, the first granulation spots appeared (Figure 2). At the eighth week, the wound was measured as 11 cm in transverse diameter, 10.5 cm wide and 2.6 cm deep (Figure 5). Twelve weeks after the first cream application, the wound was measured as 5.5 cm long × 9.5 cm wide × 1.7 cm deep (Figure 6). After 6 months, the wound was completely recovered (Figure 8).

Daily cream application can resolve inflammation and enable angiogenesis. The cream applied to the wound may have improved the capillary density by increasing VEGF production and increasing the formation of angiogenesis. A key problem with wound healing is the biofilm/bacterial bioburden in chronic wounds [16]. Medical professionals use a variety of treatment approaches including effective cleaning of acute wounds, treatment of infected wounds, mechanical debridement, and removal of biofilm bacteria in chronic wounds. SWCC has also potent wide spectrum biocidal properties. No signs of infection were observed during the treatment. The wound area was clean. Its use also improved the clinical outcome of patients and reduced the need for additional treatment and hospitalization.

The remarkable finding was stabilization of the granulation tissue was by daily debridement and cream application in the wound area during the treatment and there was no necrotic tissue left after daily wound care with cream. However, the narrowing of the wound margins and the reduction in volume of the wound were notable changes. Another remarkable finding was that re-epithelialization started after the granulation tissue filled the wound area and the wound healed completely in a short time. Wound epithelization was difficult even after the application of negative pressure wound therapy, basic fibroblast growth factor and allogenic keratinocytes [15]. There was no need for autologous skin graft during the treatment.

Prospective and randomized controlled trials are required to show the efficacy of SWCC. SWCC may have great potential to act in the three different processes involved in wound healing including inflammation, cell proliferation, and extracellular matrix remodeling. The cream stimulates wound healing, increasing re-epithelialization, contraction, synthesis of collagen and angiogenesis. The cream provides the necessary chemical signals to support tissue regeneration. In addition to other treatments, the application of cream can be an alternative treatment approach for the closure of chronic non-healing wounds when healing failed with conventional therapies.

Conclusion

SWCC has been successful in the complete closure of category IV sacral pressure ulcer in approximately 24 weeks with daily debridement. This cream does not contain stem cells but provides stem cell activation, stem cell proliferation and stem cell migration. On the other hand, it prevents biofilm formation and reduces bacterial bioburden in the wound area. It has potent biocidal properties. It also supports the formation of new vessels. In addition, it provides the construction of the extracellular matrix and its reorganization by stimulating the synthesis of collagen and elastin. Finally, it provides re-epithelialization of the wound by the migration and proliferation of keratinocytes to the region.

Implications for Clinical Practice

- Infection remained absent during SWCC treatment, suggesting that SWCC might control and prevent biofilm formation and reduces bacterial bioburden in the wound area during pressure ulcer and other chronic non-healing wound management.

- This cream can provide stem cell activation, stem cell proliferation and stem cell migration. It can also support the formation of new vessels. In addition, it can stimulate the construction of the extracellular matrix and its reorganization by stimulating the synthesis of collagen and elastin.

- The immediate initiation of SWCC treatment after surgical debridement will ensure complete closure of the wound and aid in preventing chronic conditions.

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