

Efficacious use of a Calgigraf Ag foam dressing in complete healing of a difficult-to-heal, long-standing ulcer of osteoradionecrosis

ABSTRACT

A number of dressings containing silver have been recently introduced into the wound care market as increased resistance to antibiotics has become a problem in treating infected wounds. A 54-year-old male, with adenoid cystic carcinoma treated by segmental resection and reconstruction of mandible using reconstruction plate with concomitant radiotherapy, resulted in a deep extraoral nonhealing necrotic, exuding, malodorous, and painful wound. Erythema, eczema, and trophic changes were surrounding the skin. Previous treatment was removal of exposed reconstruction plate and primary closure. Culture samples reported methicillin-resistant *Staphylococcus aureus* positive and sensitivity to linezolid. Repeated failed attempts to approximate the wound, prompted the use of Calgigraf Ag foam as dressing for the wound. Evidence of new tissue growth and subsequent reduction in wound area and exudate were significant. Chronic nonhealing wounds involving progressive tissue loss give rise to the biggest challenge to wound-care researchers. Despite proper care, some wounds fail to heal in normally and become chronic. The use of ionic silver with negative pressure therapy is safe and effective in difficult nonhealing wounds. This case illustrates the potential benefit of ionic silver combined with negative pressure and moist wound healing as management of a patient with long-standing, nonhealing, and osteoradionecrosis wound. Calgigraf Ag Foam a silver alginate dressing is optimal for maintaining moist environment vital to promote wound healing. It needs less frequent dressing changes with additional benefits such management of excessive exudate minimising malodour and maintaining a moist wound environment.

Keywords: Antimicrobial, Calgigraf Ag, exudate-management, ionic silver, moist-wound-healing

INTRODUCTION

Wound healing in adults follows an ordered progression of events, resulting in wound closure. It is recognized that no single dressing can provide effective treatment for wounds that become critically colonized with microorganisms.^[1]

When the microflora of the wound becomes imbalanced; the normal wound healing process is interrupted, resulting in a nonhealing and deteriorating wound.^[2] It is possible to reduce the wound bioburden to avoid systemic infection by the use of topical antibacterial agents such as silver and iodine^[3] which facilitate wound healing by creating conditions that are unfavorable to microorganisms and favorable for the host repair mechanisms.

A commercially available hydrocolloid, gauze in a selection of foam-film dressings fused with Hydrofiber technology impregnated with silver can be used of wound cover dressings.^[1] Silver is a broad-spectrum antimicrobial for controlling a wide range of bacterial, fungal, and viral pathogens.^[4] This manuscript will concentrate on the very newest of these dressings, Calgigraf Silver (Ag) foam with

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the following composition silver alginate, calcium alginate, and maltodextrin.

CASE REPORT

A 54-year-old male reporting to the department of oral and maxillofacial surgery had undergone surgery 6 months back for adenoid cystic carcinoma of the left lower border of the mandible and subsequent radiotherapy, resulting in a deep extra oral wound. The ulcer had been present for around 4 months. Initial assessment revealed the wound measuring 5.5 cm long \times 2 cm wide, necrotic with extensive fibrin deposits, heavily exuding, malodorous, and tender. There was erythema, eczema, and trophic changes of the surrounding skin [Figure 1]. Previous treatment was with removal of exposed reconstruction plate and primary closure [Figure 2a].

After extensive assessment, exudate was sent for culture and sensitivity test. The wound was cleansed with saline solution and a sterile hydrocellular dressing applied. The culture report was positive for methicillin-resistant *Staphylococcus aureus* (MRSA) with selective sensitivity to linezolid. The patient was hospitalized and IV linezolid 300 mg b.i.d for 7 days administered along with local wound debridement and periodic dressing. Healing was satisfactory and the patient was discharged a week later. Hydrating gel and cream were applied to the surrounding skin. Two-month later, the patient reported back with an ulcer on the same site [Figure 2b] which was bigger in size than the first reported. Culture sensitivity gave the same report of MRSA positive and sensitivity to linezolid. The treatment was same as before, but the second time, the ulcer did not show any progress in healing, rather the ulcer deteriorated further. The failure of conventional methods of repeated wound dressings prompted the use of Calgigraf Ag foam [Figure 3a and b]. Drastic reduction in the ulceration followed by improved healing was evident and the patient was recalled weekly to change the Calgigraf Ag foam dressing. By day 7, there was a significant decrease in exudate, odor, and necrosis, with the appearance of some granulation tissue. After a further 14 days [day 21] [Figure 4a and b], there was no longer any odor. The necrotic tissue and fibrin deposits had also disappeared, with significant amounts of new tissue growth and consequent reduction in wound area, depth, and amount of exudate. The evaluation on day 60, the area of wound was healthy, with no further signs of infection. Inflammation had decreased and the wound had reduced completely [Figure 5].

DISCUSSION

There are two important steps in proper wound care regimen. The first is actually dressing the wound, in which



Figure 1: Initial presentation with eczema and trophic changes of the surrounding skin



Figure 2: (a) Removal of reconstruction plate and primary closure and (b) ulcer 2 months postprimary closure



Figure 3: (a) Calgigraf Silver foam and (b) Calgigraf foam dressing shaped to cover the wound

dressings are placed to cover the wound and second, prevent harmful exposure.^[5] In few rare exceptions, wounds require several dressing changes, which can be a rather delicate process. If wounds are not properly dressed, it can lead to infections and other problems in the wound healing process.^[6]

Based on the layers involved, the wounds are superficial wounds, partial thickness wounds, and full-thickness wounds.^[7] The restoration of tissue continuity after injury is a natural phenomenon. Infection, quality of healing, speed of healing, fluid loss, and other complications that delay the healing represents a major clinical challenge.



Figure 4: Significant decrease with granulation tissue formation after periodic Calgigraf Ag foam dressing (day 45)

^[8] Majority of wounds heal without any complication, but chronic nonhealing wounds involving progressively more tissue loss give rise to the biggest challenge to wound care. The growth factors need to remain in contact with wound, for promoting autolytic debridement^[6-8] by creating a moist environment which allows the accelerated wound healing; this is the concept on which the newer dressings are designed. The gold standard in wound treatment is to achieve prompt closure of the wound while avoiding inflammation, and provide a warm, moist environment with antimicrobial protection and at the same time allowing minimal disturbance during healing.^[9,10]

Calgigraf Ag foam combines the benefits of ionic silver with the benefits of alginates; it incorporates effectiveness of silver with the absorbency capabilities of calcium alginate and polyurethane foam. Maltodextrin, one of the key ingredients in Calgigraf Ag foam, has been added to this unique formulation to reduce wound drainage and odor while promoting wound closure. It also has antiseptic properties, protecting the periwound skin from colonization by bacteria. Staphylococcus strains were significantly reduced on using Calgigraf Ag foam. It reduces the bioburden in wounds and is effective even against biofilms reducing wound maceration due to the fact that the dressings have to be changed weekly once. The absence of tissue damage during removal is another significant property associated with the use of Calgigraf Ag foam. In this case, the chronic wound caused as sequelae of osteoradionecrosis which was nonhealing was completely healed on using Calgigraf Ag foam.

CONCLUSION

Calgigraf Ag Foam with the composition of silver alginate, calcium alginate, and maltodextrin was used in direct contact



Figure 5: Complete healing day 60

with the wound bed itself. It creates the optimal moist environment vital to promote wound healing. It is easier to apply, providing sustained availability of silver ions. It needs less frequent dressing changes with additional benefits such as management of excessive exudate, minimizing malodor, and maintaining a moist wound environment. Its use thus facilitates the autolytic debridement essential for uneventful wound healing.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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