Rapid Closure of Infected Diabetic Foot through the use of Polymeric Membrane Cavity Filler*

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Introduction

This case describes a 50 year old woman with type 1 diabetes since the age of 3, with severe lower limb peripheral arterial disease (PAD) and polyneuropathy.

She suffered from ischemic heart failure with acute coronary syndrome at the age of 40. Four years later she was diagnosed with bilateral Claudicatio Intermittens. In spite of several bilateral percutaneous transluminal angioplasties (PTA) to revascularize her limbs she lost three toes on her left foot during a time period of 4 years. The latest amputation included digit 4 and 5 and was performed in March 2008. Shortly after that a new percutaneous revascularization with a stent implantation was performed.

During the past 4 years the patient had been fitted with different custom made orthopedic shoes and soles that needed adjusting very often to suit her feet as she constantly acquired new fissures, calluses and wounds.

The amputated site was treated with double layers of a silver containing hydrofiber dressing. 13 June (5 months later) the wound was still deteriorating, and due to increasing pain levels and erythema, a swab was taken and systemic antibiotics prescribed. An MRI taken the next day confirmed osteomyelitis, a few days later she was admitted to the hospital for i.v. antibiotics and intensified wound care treatment.

Aim

We wanted a dressing that was simple to use, could relieve pain, keep the wound clean, control the wound exudate and, of course, heal the wound. That is why we chose to evaluate a polymeric membrane cavity dressing that we thought fulfilled all these criteria.
We looked at pain reduction, ease of use, conformability, cleansing capability and time to heal.

Polymeric membrane dressings contain several unique integral components which work synergistically to promote the body's natural wound healing. The hygroscopic glycerin maintains a moist wound environment and prevents the dressing from sticking to the wound surface. The surfactant, which is activated by wound fluid, facilitates the loosening of the bonds between slough and healthy tissue allowing the liquefied slough to become absorbed into the dressing. This often eliminates the need of manual cleansing during dressing changes. These dressings also help relieve wound pain by inhibiting nociceptor activity.

Method

The wound was debrided and flushed with saline prior to the application of the first polymeric membrane cavity dressing. Due to the built in wound cleanser the nurses were instructed that there was no need to cleanse the wound when they changed the dressing.

During the first week the dressings were changed on a daily basis due to the increase of exudate that usually occurs with these dressings. After one week of daily changes the exudate levels had decreased so dressings were only changed three times a week. Careful debridement of crusts and calluses on the wound edges was performed a few times.

New orthopedic shoes were fitted and the patient was informed that she should try to off-load and minimize her walking activities while the wound was healing. This was not an easy task for the patient as she lived alone and did not like being dependant on anyone else.

The patient was discharged after two weeks of hospitalization when i.v. antibiotics were no longer needed. The remaining dressing changes were performed at her home by the district nurses.

Results

After the first week the patient did not complain about pain any more. Granulation tissue rapidly filled the cavity that was becoming more shallow for every dressing change. There was no recurrence of wound infection after the i.v. antibiotic treatment was stopped and the wound closed after 8 weeks in spite of minimal off-loading.

Discussion

Polymeric membrane dressings have proven to be very useful on these types of wounds. They are very conformable and comfortable for the patient. The fact that no additional cleansing is needed makes the dressing changes very simple and fast which is especially appreciated when they are performed at the patient's home.
Pain reduction was difficult to evaluate in this case as the patient suffered from polyneuropathy. However, she had complained about severe pain that started a couple of weeks before she was admitted to the hospital. After one week's use of polymeric membrane dressings the pain was substantially reduced.
We have found that long standing chronic wounds close rapidly when polymeric membrane dressings are used.

18 June 2008
Wound after two digit amputation performed 5 months ago. Previously treated with hydrofiber dressings. Now on i.v. antibiotic treatment due to MRI confirmed osteomyelitis. The foot is very red and swollen. New debridement performed today. Daily treatment with polymeric membrane cavity dressings commenced.

25 June 2008
Polymeric membrane dressings have been changed daily without additional cleansing or debridement this past week. The bleeding you see on the photo is due to a debridement of the wound edges that was performed today. The patient told us that the pain has decreased from a 6 to 2-3 on a scale of 10.

4 July 2008
New granulation tissue is rapidly filling the cavity. Dressing changes are now performed three times a week with polymeric membrane cavity dressings at the patient's home. No antibiotic treatment any more. The pain has disappeared completely. Unfortunately the patient is not willing to offload as much as we want her to.

14 July 2008
The wound continues to improve. The polymeric membrane dressings are still changed 3 times a week without any additional cleansing in-between the dressing changes. Today a gentle debridement of the surrounding crusts was performed. The patient is using her new orthopedic shoes and walking several hours a day.

28 August 2008
For five months this patient has had an open cavity wound after a two-digit amputation. When she came to us it was infected, osteomyelitis was confirmed, and the patient was in a lot of pain. Today, after 8 weeks treatment with polymeric membrane dressings, the cavity has finally closed.

Bibliography

Blackman JD, Senseng D, Quinn L, Mazzone T. Clinical evaluation of a semipermeable polymeric membrane dressing for the treatment of chronic diabetic foot ulcers. Diabetes Care. 1994;17(4):322-5.

P Vowden, RA Cooper (2006). An integrated approach to managing wound infection. European Wound Management Association (EWMA). Position Document: Management of wound infection. London: MEP Ltd, 2006, 2-6.

Beitz AJ, Newman A, Kahn AR, Ruggles T, Eikmeier L. A polymeric membrane dressing with antinociceptive properties: analysis with a rodent model of stab wound secondary hyperalgesia. J Pain. 2004 Feb;5(1):38-47.

*PolyMem® WIC Cavity Wound dressing
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