

CONTROLLING EXUDATE AND PROMOTING HEALING OF A CHRONIC WOUND

KEY WORDS

- ▶ Diabetic feet
- ▶ Type 2 diabetes
- ▶ Chronic wounds
- ▶ Dressing selection

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Background: Up to 200,000 people in the UK have a chronic wound with the cost of treatment estimated to be between £2.3bn and £3.1bn per year and increasing (Posnett and Franks, 2008). Following the advancement of the concept of moist wound healing (Winter, 1962) the focus has moved to chronic wound care and the development of dressings that promote a moist environment to assist healing (Harding et al, 2002). **Aim:** To provide an insight into the clinical performance of ActivHeal Aquafiber® (Advanced Medical Solutions) in controlling exudate and promoting healing of a chronic wound in a patient with type 2 diabetes. **Method:** ActivHeal Aquafiber was used on a patient with type 2 diabetes and a chronic heavily exuding category 3 pressure ulcer, which had become hard to heal. The wound was assessed over a six-week period, during which dressing changes took place every second day. Dressings were assessed for the ability to manage exudate, the ability to maintain a moist environment, conformability and comfort levels. **Results:** ActivHeal Aquafiber was evaluated by the nurses survey over a period of six weeks. During this time, the dressing was found to be effective at managing the patient's exudate level. Furthermore, the amount of slough in the wound was greatly reduced and the wound continued to heal and reduce in size. **Conclusion:** Although healing was delayed by a number of factors, it demonstrated that ActivHeal Aquafiber created a moist wound healing environment which provided optimum conditions for wound healing to occur. The dressing aided autolysis, supported granulation, effectively absorbed exudate and maintained a moist wound environment to enable wound progression.

The challenge for nurses lies in creating an optimum wound healing environment that is neither too wet nor too dry. Excessive wound exudate or other bodily fluids, such as urine or sweat can cause skin maceration around a wound, which may delay healing and lead to other complications (Cutting and White, 2002). The management of exudate

can be a major challenge for nurses as exudate must be effectively managed if the optimal moist environment necessary for wound healing is to be created (White and Cutting, 2006). Patients with chronic wounds often cite odour and exudate as the most disturbing issues (Jones, 2008).

NHS Dumfries and Galloway provides healthcare to approximately 148,500

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members of the public, and within this population, 5.2% have diabetes. With a high percentage of the population of retirement age, the region has an older than average age profile and, proportionately, more people have type 2 diabetes than the rest of Scotland. Indeed, some 7,771 individuals are recorded as having diabetes in Dumfries and Galloway. However, it is believed that a further 2,316 individuals have this condition but have yet to be diagnosed (Diabetes UK, 2011).

DIABETES

Diabetes is characterised by hyperglycaemia — it is well established that high glucose levels can increase the risk of diabetes-related complications specifically arterial disease, neuropathy and risk of infection (UKPDS, 1998). Wound healing and neutrophil function is impaired by hyperglycaemia, so tight glycaemic control is essential (Edmonds, 2006).

In addition to ensuring that the adequate delivery of glucose to the tissues of the body takes place, the treatment of diabetes attempts to decrease the likelihood that the tissues of the body are harmed by hyperglycaemia (Fowler, 2008). The management of diabetes should aim to minimise symptoms and reduce the likelihood of complications occurring, thus allowing the person living with diabetes to experience the best quality of life (Davey, 2004).

Peripheral neuropathy can be defined as the impairment of nerve structures and function (Newton, 2008). The most common symptom of diabetic neuropathy is the loss of pain sensation, particularly in the feet. If untreated, this can cause unrecognised trauma injuries and may develop into an ulcer that can be very difficult to heal.

NICE (2004) has identified that the prevalence of peripheral neuropathy in patients with diabetes is 20–40%, clearly indicating that this is an important aspect of monitoring diabetic patient care. Evidence supports regular foot screening for all patients with diabetes to identify those at risk of foot ulceration and amputation (Singh et al, 2005).

In the UK, it is conservatively estimated that there are around 64,000 individuals with active foot ulceration at any time and

2,600 amputations annually in diabetic patients with a foot ulcer (Gordois et al, 2003).

Diabetes is known to be a major factor in the development and complication of a wound. Once an ulcer has developed, there is an increased risk of wound progression that may ultimately lead to amputation (Clayton and Elasy, 2009).

ACTIVHEAL AQUAFIBER

ActivHeal Aquafiber is a soft, conformable, fibrous dressing that converts to a soft clear gel and provides an ideal moist environment that supports wound healing (*Figures 1 and 2*).

Exudate is absorbed vertically into the dressing, reducing the risk of maceration and damage to the periwound skin (Timmons, 2008). The dressing also provides an environment that aids autolysis within a wound and is indicated for moderate to heavy exuding wounds (Hawkins, 2010).

CASE STUDY

This case study was carried out at the Thomas Hope Hospital, Scotland, a 12-bed community hospital accessible to local GPs and consultants from Dumfries and Galloway Royal Infirmary and Cumberland Infirmary Carlisle. The hospital provides assessment, rehabilitation and palliative care of adult patients

Patient A is an 83-year-old man with poorly controlled, type 2 diabetes and as a result, has developed peripheral neuropathy and pressure damage to his left heel (*Figures 3–5*).

The patient has had a previous history of ulceration to his heel tissue as a result of pressure damage. The ulceration had been difficult to heal due to poor glycaemic control as a result of poor eating habits. This situation was not improved by the patient's, and his family's, lack of knowledge regarding diabetes.

Prior to admission, the patient was fully mobile and living independently at home and then became bed bound, requiring full care due to the pressure ulcer on his left heel.

The patient was categorised as being

'active', therefore, a rapid referral to the Diabetic Specialist Team was made by the primary author. The patient attended the multidisciplinary foot clinic to access the best possible treatment and pathway of care which would include; a vascular referral, intensified foot care education and specialist footwear.

He was also provided with access to diabetologists, dieticians and specialist nurses to improve his glycaemic control as recommended by SIGN (2010) (although the patient had a history of previous ulceration he also had a history of non-compliance and had failed to attend hospital appointments on previous occasions).

The Scottish Diabetes Foot Action Group (SDG) has developed and introduced a national strategic plan for diabetic foot care across Scotland (Figure 6).

This has involved the implementation of an evidence-based national foot screening and risk stratification programme, which has already covered 61% of the population in just the first two years (Leese et al, 2011).

Initial Assessment

Assessment is an essential part of wound bed preparation and can be used to select the most appropriate



Figure 1: *ActivHeal Aquafiber ribbon.*

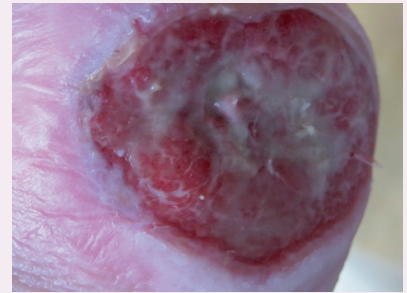
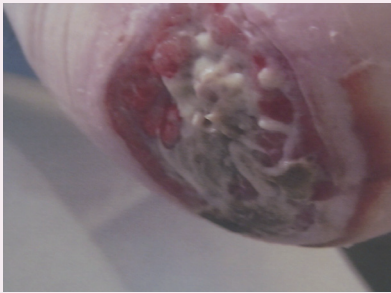
treatment option to optimise wound healing (Falanga, 2004). On admission to the unit the patient presented with an extensive area of necrosis and slough on the left heel. Non-viable tissue will prevent the wound from healing and should be removed using an appropriate debridement method to restore the wound bed (Ousey and Cook, 2012). Following the assessment the wound



Figure 2: *ActivHeal Aquafiber.*

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Left to right: Figure 3: Wound is very sloughy with some necrosis. Periwound skin is macerated. Commenced dressing wound with ActivHeal Aquafiber. Figure 4: The heel with some evidence of autolytic debridement, with slough softening. Figure 5: The wound continuing to reduce in size, although there is some slough present.

was classed as a category three pressure ulcer (EPUAP/NPUAP, 2009). Initially, a hydrogel was used to assist in the debridement of the necrotic tissue.

Once the necrotic tissue had softened and sharp debridement had been carried out, the wound was reassessed, and as the exudate levels had increased the dressing regimen was changed.

The tissue type was identified as being sloughy with high levels of exudate. Chronic wounds can often be colonised by bacteria and this can cause an increase in exudate levels, which, if left untreated, may lead to wound infection (Vuolo, 2009).

The wound was then treated with an antimicrobial dressing as it was identified as being heavily colonised and was not healing. Additionally, the periwound skin was a concern due to the amount of exudate produced by the wound.

As the antimicrobial dressing regimen had failed to progress the wound, it was decided to dress the wound with ActivHeal Aquafiber for exudate management and to assist in the facilitation of autolysis of the devitalised tissue.

The patient was also placed on a regimen that included a pressure-relieving surface and regular repositioning — no other specialist heel protection was given.

The wound was redressed every second to third day over a six-week period and although the progress was slow there was evidence of autolytic debridement, granulation and exudate control, with no signs of periwound maceration. ActivHeal Aquafiber continued to be

used on the patient with the objective of the wound progressing to a level that the patient could be returned to his home environment and the community nurses would be able to continue with the dressing regimen. The patient and his family were educated regarding foot care and neuropathy, pressure redistribution and the control of his diabetes through diet.

Furthermore, the multidisciplinary foot care team consisting of podiatrists, orthotists and diabetic specialist nurses continued to work with Patient A on discharge to prevent further re-ulceration of the wound.

DISCUSSION

Previous ulceration is the strongest predictor for recurrent ulceration and preventative measures need to be addressed following healing (Leese et al, 2009). One of the major factors that would affect healing of a wound would be the glycaemic control of the patient.

Patient A had been admitted on a previous occasion with foot ulceration in the same place. His previous admission had been due to non-compliance with controlling his diet, and monitoring and attending to his foot care. Patient A was known to the district nurses who reported at this admission that despite various efforts to get the patient to be more compliant, he was not conforming to the recommended eating programme.

During the hospitalisation of patient A, his diet was monitored and controlled, however, when he was discharged he returned to his normal dietary habits leading to hyperglycaemia, which has been linked with development of micro and macro-vascular complications in diabetes

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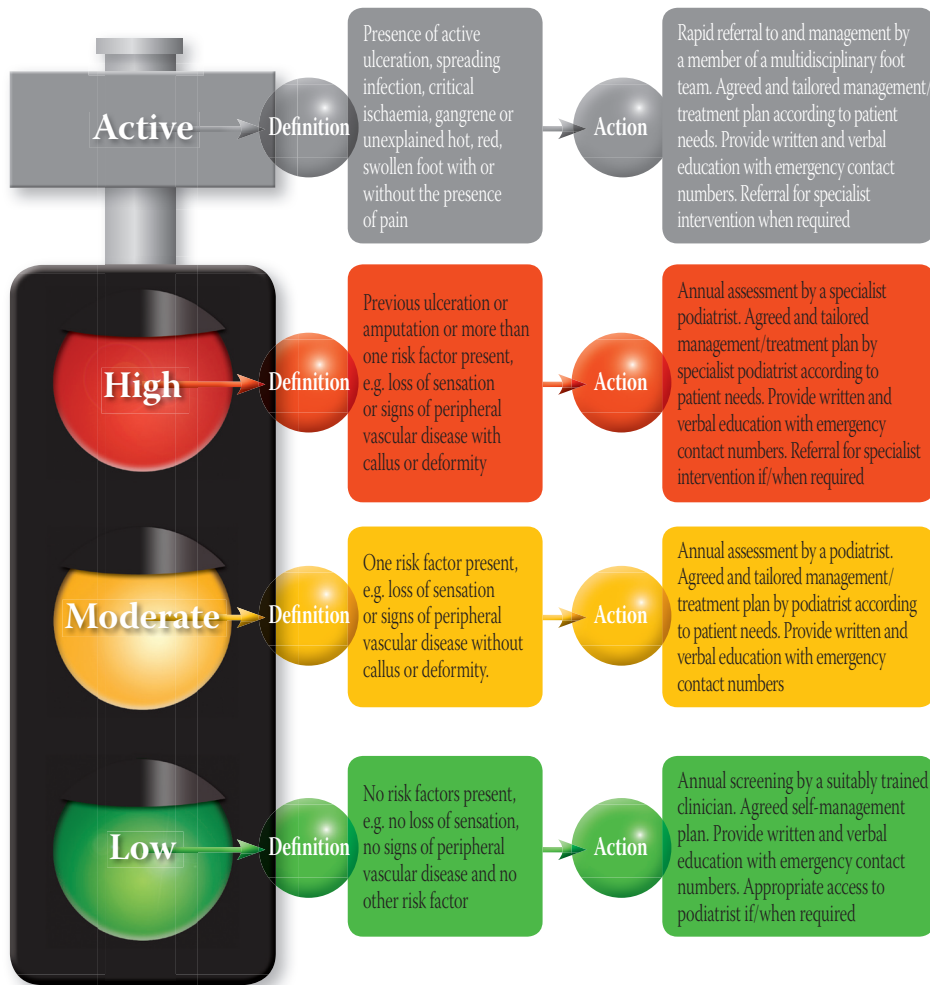


Figure 6: Diabetic foot risk stratification and triage.

(Lockman et al, 2011).

Patient A did not initiate regular skin inspection of his feet. Patients should be instructed on the importance of maintaining their foot health. The provision of patient information should be viewed as an ongoing process. Improving patients' understanding of the condition empowers them to perform effective self-care measures (McIntosh, 2008).

Peripheral neuropathy is the degeneration of the peripheral nerves, leading to loss of sensation and autonomic dysfunction and can lead to severe foot problems (NICE, 2004). Here, inappropriate shoes had resulted in pressure damage to the heel, and due to this nerve damage, the patient was unable to feel pain or pressure, leading directly to the formulation of the pressure ulcer.

Diabetes is a costly condition, taking up to 10% of the NHS budget, and a significant part of this cost is attributable to in-patient care and treating diabetic-related

conditions (DH, 2012). Diabetes care in the NHS has an approximate price tag of up to £9bn with up to 20% (£600m) being used to treat diabetic foot ulcers (Roberts, 2006; NICE, 2011). One strategy for reducing diabetic foot problems lies in the provision of patient information and education. Valk et al (2005) assessed the effectiveness of patient education in the prevention of diabetes associated foot ulceration. The study found that in particular groups at high risk of ulceration, improving patients' knowledge of foot care positively influenced behaviour. In patient's A case it took the second episode of ulceration to ensure that he complied with the patient education and information.

Many of the complications associated with diabetes could be reduced by implementing structured education as an integral part of care of patients with diabetes. As NICE (2008) and SIGN (2010) state, all people at risk of, and diagnosed with, diabetes should have

'In order to facilitate the wound healing process of diabetic foot ulcers, it is crucial to achieve optimum glycaemic control'

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an opportunity to attend a structured education programme with annual follow up. Although structured education programmes that would have reduced the impact of complications were available to Patient A, he declined to become part of these, which resulted in the development of a chronic pressure ulcer that could have been avoided.

The Better Diabetes Care Survey (Diabetes UK Scotland, 2009) for Dumfries and Galloway has shown that the region has a strong performance in frontline diabetic care, such as ensuring that everyone accesses annual diabetes health reviews and screening. The area is also ahead of other health boards in foot health and diabetic education.

In 2007, Diabetes UK Scotland and NHS Quality Improvement Scotland compiled feedback from focus groups and surveys to report on the experience of care from people living with diabetes. The review of the care experienced within Dumfries and Galloway has credited this region with offering advice leading to improvements in diabetes control, while diabetes specialist nurses (DSN) and dieticians have been commended for excellence in managing treatment plans and recommending diets.

The introduction of the diabetes structured education programmes DAFNE — 'Diabetes and self management for ongoing and newly diagnosed' — (for type 1) and DESMOND — 'Diabetes and self management for ongoing and newly diagnosed' — (for type 2), have been a welcome addition to diabetes education within this region and have helped many patients in the area with type 2 diabetes.

In Patient A's case, although this education had been previously offered by the Diabetic Specialist Team, it had been declined by the patient and his family, which, at least in part, resulted in the patient's readmission to hospital with diabetic foot ulceration

In this case study, although healing was delayed by a number of factors, it was demonstrated that ActivHeal Aquafiber created a moist wound healing environment, which provided optimum conditions for wound healing to occur. ActivHeal Aquafiber aided autolysis, supported granulation, effectively

absorbed exudate and maintained a moist wound environment to enable wound progression.

CONCLUSION

Healing a wound is a complicated process which can be affected by a number of factors, these include: age, body type, chronic disease, immunosuppression, nutritional status, radiation therapy, vascular insufficiencies, diabetes, unrelieved pressure and non compliance.

However, wound healing can be delayed by factors local to the wound itself, including desiccation, infection or abnormal bacterial presence, maceration, necrosis, pressure, trauma, and oedema (Thomas-Hess, 2011).

For this patient, one of the major factors preventing the wound from healing was maceration due to the high levels of exudate being produced. Chronic wounds are prone to high exudate levels due to the volume of tissue loss and the potential for higher bacterial burden (Timmons, 2008).

The other factor inhibiting wound healing was poor glycaemic control. In order to facilitate the wound healing process of diabetic foot ulcers, it is crucial to achieve optimum glycaemic control (McIntosh, 2008). The initial choice of dressing regimen failed to progress the wound and ActivHeal Aquafiber was, therefore, chosen.

This case study shows that the ActivHeal Aquafiber was an effective wound care dressing choice to assist in the facilitation of autolysis of the devitalised tissue and manage excess exudate. ActivHeal Aquafiber was effective in the management of exudate and created an appropriate environment for healing and wound progression.

This case study suggests that ActivHeal Aquafiber has the attributes of an absorbent fibre dressing that can be used on a range of chronic wounds. With the wide range of dressing/therapies available and in view of clinicians' knowledge and personal preferences, a basic understanding of how to use these products is essential to ensure that they are used effectively, and cost-effectively, and are acceptable to patients (Benbow, 2011). **WUK**

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