Case study

Use of a hydrogel dressing for management of a painful leg ulcer

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Wound healing is affected by many variables, which must be assessed before treatment can commence. These include patient factors (e.g., mental status, age, pain, mobility, nutritional status and comorbidities), wound factors (e.g., peri-wound skin status, vasculitis, cellulitis, wound colour, odour, and incontinence), as well as the macroscopic and microscopic environments (Snyder, 2004). Evaluation of necrosis, infection, nutrition, pressure, perfusion and tissue moisture balance are also paramount (Snyder, 2004).

Because of the multitude of factors that can affect healing progress, wounds cannot be tended to in isolation. The nurse needs to have an understanding of the process of wound healing and have undertaken a full patient assessment before focusing on the patient’s wound. Recognising and managing problems at the wound bed, e.g. necrotic tissue and excess exudate, can result in a better prepared wound bed and optimal healing (Dowsett, 2002).

It is important that any devitalized tissue is removed from a wound as soon as possible. For most patients, the presence of non-viable tissue is distressing as it can produce a noxious odour and frequently an unacceptable discharge. The devitalized tissue provides a suitable culture medium for bacterial growth, and wounds containing necrotic tissue are therefore at risk of becoming clinically infected (Poston, 1996).

Wound exudate is all too often perceived as a clinical management problem. While this can be the case, it should be recognized that exudate does fulfil an important function in the healing process. Gradual acceptance of the benefits of moist wound healing, combined with the current goals of the ‘ideal’ moist environment, focus attention on the role of exudates (Cutting, 2003). Although wound exudate is necessary for healing, when its production becomes excessive it becomes a problem, contributing to skin maceration and delayed wound healing. Treating the underlying cause of excessive exudate generation and selecting appropriate dressings are the keys to effective management (Wåtret, 1997).

Chronic wounds

Most chronic wounds have become ‘stuck’ in the late inflammatory phase of wound healing. For the normal repair process to resume, the barrier to healing must be identified and removed through application of the correct techniques (Schultz et al, 2003). This can be distressing and frustrating for patients who may have lived with such a wound for many months or even years. The key to the concept of wound-bed management is to prepare the wound so that modern methods of promoting healing can then be applied (Collier, 2002).

Chronic wounds are characterized by loss of skin or underlying soft tissue and does not progress toward healing with conventional wound care treatment. There are four basic principles of chronic wound care:

- Remove debris and cleanse the wound
- Provide a moist wound healing environment through the use of proper dressings
- Protect the wound from further injury.
- Provide substrates essential to the wound healing process.

The removal of devitalized tissue, particulate matter, or foreign materials from a wound—debridement—is often the first goal of wound care. Debridement can be accomplished surgically (instrument/sharp), chemically, mechanically or by means of autolysis. Each procedure has distinct advantages, disadvantages, indications for use and risks, and a combination of methods will often expedite the process while limiting the chance of complications (Fowler and van Rijswijk, 1995). Underlying the care of chronic wounds is the necessity to assess the wound on an ongoing basis. Changes in wound care must be based on changing wound parameters, and timely, complete and accurate wound assessments must be documented (Frantz and Gardner, 1994).

Hydrogels

Many different types of wound dressings are available. It is important that nurses know what sort of dressing
Hydrogel dressings can be used on necrotic, sloughy, granulating, and epithelializing wounds (Figure 1) and can be used in infected wounds if the patient is receiving systemic antibiotics and the dressing is changed daily.

ActiFormCool

ActiForm Cool dressings are two-sided, colourless, transparent hydrogels formed around a supporting blue polyethylene matrix and contain approximately 70% water with the remaining 30% consisting of a swollen acrylic polymer with phenoxyethanol as a preservative. The gel is permeable to water, vapour, gases, and small protein molecules, but impermeable to bacteria. The cooling element of the dressing provides a moist environment at the surface of the wound and this has been found to reduce pain in painful wounds (Hampton, 2004; Collins and Heron, 2005).

The case study

The patient, an 82-year-old lady, had a venous leg ulcer of 5 months’ duration on the left lateral gater area (Figure 1). The ulcer was shallow, diffuse and exuding high amounts of fluid, presenting initially with two management problems: that of a sloughy wound bed, and maceration to the peri-ulcer skin. A key objective of the consequent wound management plan would be to remove the slough and promote the growth of granulation tissue (Gray et al, 2005) while concurrently managing the exudate. Slough formation is common during the inflammatory stage and occurs when a collection of dead cellular debris adheres to the wound surface, creating a fibrous cover across the bed of...
the wound. Slough must first be removed from the wound bed in order that an optimal environment may be achieved to promote the formation of granulation tissue.

Maceration occurs when excessive amounts of fluid remain in constant contact with the skin. Wound exudate, while an essential component of the local wound healing environment, can provide this excessive fluid. The enzymatic component of the exudate can lead to skin damage and even an increase in size of ulcer.

The ulcer had previously been managed by the district nurses who initially tried a 4-layer bandaging compression system. Despite the use of this compression, the ulcer continued to produce large amounts of exudate and daily visits by the nurses were required in order to manage it. As time passed, the patients ability to tolerate the compression produced by the 4-layer system declined. The compression was therefore changed over time to 3-layer, then to short stretch bandages. Several factors contributed to the patient's changing response to compression, including pain caused by the ulcer and despondency that the ulcer was not healing.

The management of this patient raised a number of concerns among the district nurses, and the team eventually concluded that with respect to this particular patient, they were running out of ideas, although the problem still remained. This prompted intervention by the tissue viability nurse specialist (TVN).

The initial TVN assessment was made in July 2004 (Figure 1). Although the lady had an independent rubor, with capillary refill when dependent, the toes blanched when elevated, suggesting there may be an underlying element of arterial aetiology. However, there was no resting or night pain reported. The limb was generally oedematous and Doppler assessment gave an ABPI of 1.02. Taken on balance it was decided that it was safe to compress. The ulcers were wet, but the skin on the feet was dry.

Holistic assessment and a care plan tailored to reflect a patient's individual needs are an essential component of leg ulcer management. Local documentation and guidelines developed by the TVN take the assessor through a logical series of questions which considers many aspects of the patient as a whole person: staring with height, weight and blood pressure, the assessment proceeds through past medical history (including details of pregnancies), current medication and any known allergies, social details (e.g. support networks, mobility, where they sleep (e.g. chair/bed) etc) and progresses to undertake a general health assessment, before examining the leg, skin and finally the ulcer. Very detailed note is taken of the ulcer history (and any previous ulcer history) position of the ulcer, surrounding skin condition, wound edges, depth, exudate and level of joint mobility and pain. Only then is the Doppler assessment used to support the clinical presentation of the ulcer, and a diagnosis made. This holistic and systematic approach not only supports a reliable diagnosis but has also been shown to help achieve concordance: working with the patient to address their main identified problems helps to formulate a care plan which is more likely to be acceptable to the patient and therefore adhered to.

In the case of this patient, the main issues were pain, and quality of life relating to the amounts of exudate. Leg ulcers, in particular, have been shown to have a significant impact on patients’ quality of life, with experience of pain being the most overwhelming feature. In addition patients have found the effects of coping with leakage and odour from wet dressings to be particularly distressing and at times unbearable, often leading to social isolation (Charles, 1995; Walsh, 1995; Neil and Munjas, 2000; Douglas, 2001; Rich and McLachlan, 2003).

Following the initial assessment in July 2004, a hydrofibre dressing was applied to the ulcer bed to act as a soothing wound contact layer. It was also capable of desloughing, absorbing exudate and providing an optimal environment for granulation to take place. This was combined with a full compression bandage system which should aid venous return, reduce oedema and further help to control exudate levels.

Unfortunately during the following 3 months the patient was unable to tolerate the compression because of discomfort at the ulcer bed, and between July and October the wound began to obviously deteriorate, the ulcer extending in size and maceration developing to the peri-ulcer skin (Figure 2).

Figure 1. July 2004. The ulcer had been unhealing for 5 months. It is macerated and painful.

Figure 2. October 2004. Maceration and an increased ulcer size indicate deterioration.
This was not an easy case but it was certainly a successful one from this perspective.

Conclusion

This case study shows that there are simple solutions to problems within wound care, but that requires careful thought and assessment of the individual patient. In this instance, ActiFormCool was the ideal dressing and led to concordance of the patient and healing of the wound.

Collins J, Heron A (2005) Stages of wound healing: applications in practice – Abstract. Wounds UK 1(2) [AQ10 Pages]
Snyder R (2004) Proteases in wound healing: understanding how these chemical mediators work represents a paradigm shift in wound care. Podiatry Management (www.podiatrym.com - subscription required)

**KEY POINTS**

- Holistic assessment is essential to identify and address all the factors affecting the formation and healing of a wound.
- Wounds cannot always be treated in the ideal way.
- Treatment should aim to achieve the best fit between the clinical priorities and the patient’s needs, which may not be the same.
- Regular reassessment is needed to monitor the wound. Changes in the wound may require changes to the treatment regime.
- In this case, ActiFormCool and reduced compression were able to address the patient’s needs for exudate control and comfort.

**Figure 3. May 2005. The wound is all but healed at this point.**