A new double-layered Hydrofiber® dressing for managing the highly exuding wound

A complex, highly exuding wound presents a challenge to even the most experienced clinician. For an effective management approach, the clinician must be able to select the correct dressing based on the characteristics of the patient’s wound and needs, as well as considering cost. In this case report, a new double-layered Hydrofiber® (ConvaTec) dressing, with stitch bonding that increases tensile strength, was used in combination with an absorbent foam as the secondary dressing. This improved the patient’s quality of life, as well as reducing the financial burden of managing a complex, chronic wound.

MANAGING A COMPLEX, HIGHLY EXUDING WOUND

Managing a complex, highly exuding wound presents a challenge to even the most experienced clinicians. Advances in wound care products now enable the clinician to tailor wound care regimens based not only on the presenting wound aetiology, but also on the physical and financial constraints of many healthcare providers. The importance of the latter has never been more evident as the demand for health services are at a peak. Therefore, if clinicians can reduce the number of dressing changes and thus reduce patient contact, improving clinical efficiency while maintaining the efficacy of woundcare treatments, such wound dressings would be highly attractive to the healthcare provider.

This case report outlines the management of an individual with diabetic foot ulceration who presented to Liverpool Hospital, Sydney, Australia.

THE PATIENT

Ms Z, a 65-year-old woman with longstanding type 2 diabetes, was referred to the high-risk foot service with a right foot, plantar calcaneal neuropathic ulceration. The ulceration originated as a result of increased plantar pressure caused by a Charcot neuropathic osteoarthropathy foot deformity. She was an inpatient in the hospital under the care of the vascular surgery team for a non-related foot pathology. Ms Z’s medical history included type 2 diabetes (diagnosed in 1995), hypertension (diagnosed in 1999), and peripheral neuropathy (diagnosed in 2000).

Ms Z’s presenting HbA1c was 74 mmol/mol (8.9%); however, medical records revealed a long history of suboptimal glycaemic control. Medication included atenolol 25 mg once-daily, simvastatin 40 mg once-daily and metformin 850 mg twice-daily. Ms Z was also a known smoker of 20 years.

CLINICAL PRESENTATION

Ms Z presented with a plantar calcaneal ulcer, which was graded as Texas classification 3B (bone or joint involvement/non-ischaemic infected), measuring 50 mm x 65 mm. The exudate levels were high, causing surrounding periwound maceration. The wound base was granulating; however,
the calcaneus was clearly exposed at the inferior aspect of the wound. The ward nurses had been dressing the wound every day with a multilayered dressing pad because of the levels of exudate and strike-through; however, on initial presentation, the dressing was oversaturated.

**ASSESSMENT**
A Modified Neuropathy Disability Score (MNDS) was undertaken, which indicated dense diabetic peripheral neuropathy with a patient score of 10/10\(^2\). The MNDS is a composite measurement indicating that the maximum deficit score of 10 would indicate complete loss of sensation, while a MNDS of \(\geq 6\) equates to an increased risk of insensate foot ulceration\(^2\). The tibialis posterior and dorsalis pedis pulses were palpable, indicating good peripheral blood flow.

**INVESTIGATIONS**
A plain X-ray showed chronic calcaneal osteomyelitis with erosion of the inferior aspect on the plantar calcaneum [Figure 2]. Inflammatory markers showed only mildly elevated signs: white blood cell count was 8.0 \(\times\) 10^{9} L, electron spin resonance was 35 mmol/L and C-reactive protein was 7.2 mg/L. Bone sequestra was obtained from the base of the wound and sent for semi-quantitative microbiology, culture, and sensitivity. The results of the swabs indicated a 2+ *Pseudomonas aeruginosa* as a coloniser and 3+ *Staphylococcus aureus* as a possible pathogen of infection.

**TREATMENT AND MANAGEMENT**
In consultation with the vascular surgery team, Ms Z’s chronic osteomyelitis was treated conservatively; she was prescribed amoxycillin 875 mg plus clavulanic acid 125 mg (Augmentin® Duo Forte) in combination with ciprofloxacin 500 mg every 12 hours. She was immediately discharged following the high-risk foot clinic consultation, and follow-up was weekly with the high-risk foot team and the community nursing team.

With regards to the dressing protocol, the clinicians were not only focused on controlling the level of exudate to limit peri-wound maceration, but also on the interval time between dressing changes. Ms Z had expressed her concerns regarding the amount of dressing changes required as an inpatient (daily dressings), and that if this were to continue it would impact on her normal daily life. In addition, the community nursing team expressed their desires to avoid daily dressings if possible because of the increasing demands on their service.

For this reason, a new dressing technology comprising a double-layered, stitch-bonded Hydrofiber (Aquacel Extra®, ConvaTec) was used as the primary dressing in combination with a secondary dressing of an absorbent foam to:
- Control the level of exudate and thus peri-wound maceration.
- Extend the time between dressing changes without impacting on the above.
- Maintain an optimal wound environment, while systemic antibiotics addressed the infection process.

The dressing plan was implemented and on the advice of the high-risk foot team the community nurses changed the dressings once weekly. During this period, no strike-through or saturation of the dressings were reported. At day 14 after initial presentation, the wound exhibited improved granulation and there was no peri-wound maceration even though the exudate levels were moderate to high [Figure 3].

The dressing regimen continued with twice-weekly changes, and Ms Z was reviewed by the high-risk foot team 34 days after presentation [Figure 4]. At this point, there was marked granulation and the ulcer had reduced in size to 40 mmx40 mm. There was minimal to no peri-wound maceration, and importantly the dressings used were not oversaturated with exudate. The level of exudate had also reduced to a mild-to-moderate level as a probable result of the systemic antibiotic therapy.
DISCUSSION
Managing the complexity of a chronic, highly exuding wound presents a challenge to even the most experienced clinician. In order to develop an effective management approach, the clinician must be able to select the correct dressing regimen based on the characteristics of the wound and also the patient’s needs. Today’s health care is economically driven, and this is an important consideration when managing a pathology such as a wound or ulceration that poses a large financial burden. Although no up-to-date costs are readily available within Australia, a UK-based study estimated the annual expenditure for the care of chronic wounds to be £2.3–£3.1 billion at 2005–6 prices10.

The focus of managing the patient in this case report was not primarily the calcaneal osteomyelitis, but more how to efficiently utilise a dressing regimen that would cater for the multiple needs of the patient, clinician and healthcare resources. Even though the underlying infective process was the cause of Ms Z’s increased exudate, the wound required a dressing that could optimise the action of antibiotics by creating an optimal wound environment, while managing the high exudate levels and reducing periwound maceration and strike-through of the dressing.

A new double-layered Hydrofiber technology (Aquacel Extra8) incorporating a stitch bonding that increases tensile strength was used in combination with an absorbent foam as the secondary dressing. At no point over the course of using this new regimen were the dressings reported to have strike-through, and as such this dressing regimen enabled the time between community nursing visits to be extended from daily, which was occurring in the hospital, to once weekly at the patient’s home and once weekly at the high-risk foot clinic.

The foreseen economic advantages of using absorbent dressings and “modern dressing” regimens to reduce patient visits, reduce dressing changes and therefore reduce dressing costs have been well documented4,11. In one such study on absorbent dressings for pressure ulcers, the study compared them against traditional dressings. A reduction in the financial burden of 56% was noted, largely as a result of the lower frequency of dressing changes, reduction in the cost of nursing time and a reduction in the average cost per week of materials8. Importantly for Ms Z, she commented that she had an improved quality of life, which was attributed to no unpleasant strike-through on the dressings, reduced malodour and the reduction in community nursing visits that allowed for a more normal lifestyle instead of planning her days around the community nursing visits.

CONCLUSION
There is a fine line between balancing the needs of the patient against the financial and infrastructure burdens of the healthcare system. As the demand for healthcare services increases, the utilisation of resources is paramount. This case report identifies the possible advantages of a new Hydrofiber dressing, which may enable an improved quality of life for the patient, as well as reducing the financial burden of managing complex chronic wounds, such as diabetic foot ulceration. ■

References


