Use of a superabsorbent dressing in the management of exudate in hard-to-heal wounds

Abstract

With the shift in demographics towards an ageing population with multimorbidity, the number of hard-to-heal (chronic) wounds is increasing each year. This poses a challenge for both health professionals, for whom wound management is becoming more complex, and for patients, who have to cope with exudate production, malodour and pain.

This article summarises understanding of healing in such wounds and how best to meet the challenge of exudate, which is a ubiquitous hallmark of hard-to-heal wounds. The role of superabsorbent dressings is considered, with particular reference to Kliniderm superabsorbent in the management of people with these challenging wounds.

■ Hard-to-heal wounds ■ Exudate ■ Malodour ■ Superabsorbent ■ Quality of life

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The global prevalence of wounds is predicted to increase by approximately 11% per annum (Guest et al, 2017), with a burgeoning cost to the NHS. The most recent publication from Guest et al (2020) on the health-economic burden of wounds to the NHS found that the annual prevalence had increased by 71% from 2012/2013 to 2017/2018, with an associated increase of 48% in real terms for patient-management costs.

Almost all (about 90%) of wound care is delivered in the community (Dowsett et al, 2014), accounting for 40% of community nurses' caseload. Given the increasing size of the older population, coupled with the rising incidence of long-term, high-risk conditions, the number of people with hard-to-heal wounds is likely to rise still further. The problem is not restricted to the ageing population, as younger people can also be affected by hard-to-heal wounds, which can hamper both their ability to work and their personal lives (McCaughan et al, 2018), potentially leading to psychosocial problems. Therefore, it is vital to understand what causes wounds to become hard to heal and how to manage them.

At present, wound management is being complicated by the unprecedented circumstances brought about by the COVID-19 pandemic. There is a need to maximise resources and reduce risk to already overburdened clinicians, which has meant building on work already underway around empowering patients to self-care, as well as increasing involvement of family and carers (Wounds International, 2016). This move has been supported by increased use of digital and social media platforms, not only for patients but also for staff, with online support provided to clinicians by tissue viability nurses (TVNs). These strategies are likely to remain even after the pandemic ends, as the days of nurses being able to dress all wounds are long gone; this is not sustainable or, indeed, necessary. Practically, reduced home visits will mean optimising strategies, such as exudate management, for example, by ensuring effective absorption and retention through judicious dressing selection.

Hard-to-heal wounds

Most hard-to-heal wounds are a consequence of systemic disease and/or poor overall health. *Box 1* lists some examples of the different types of hard-to-heal wounds, including those with atypical aetiologies.

A comprehensive, structured patient assessment is required to identify the underlying wound aetiology and any comorbidities that might delay healing. As part of NHS England's Improving Wound Care Project, Coleman et al (2017) devised a minimum data set (MDS) with domains that need to be considered during assessment. These domains can be used to monitor

Box 1. Examples of hard-to-heal wounds
Pressure ulcers
Diabetic foot ulcers
Pyoderma gangrenosum
Dehisced surgical
Fungating
Hidradenitis
Pilonidal sinus

any improvement or deterioration in the wound and can be summarised as follows:

- General health information, such as patient risk factors, that might delay healing
- Baseline wound information, such as the number, location, duration and type of wound(s), treatment objectives and assessment frequency
- Wound assessment parameters, such as wound size, wound bed characteristics, full description of the wound margins and surrounding skin, presence of undermining and tunnelling
- Wound symptoms, such as ongoing or intermittent pain, exudate volume and nature, malodour and signs of localised or systemic infection
- Need for specialist referral.

Patient-related barriers to healing include diabetes, ischaemia, poor nutrition, advanced age, impaired mobility, smoking and use of corticosteroids (Gray et al, 2018) (*Box 2*). Local factors include the ulcer size and duration, its anatomical location, the condition of the wound bed, the presence of biofilm and/or infection, hypoxia, raised temperature and foreign bodies (Vowden, 2011). The sooner these problems are detected, the easier they are to manage (European Wound Management Association (EWMA), 2008).

Normal wound healing

All wounds progress through the same overlapping phases of healing: haemostasis, inflammation, proliferation and contraction (Martin and Nunan, 2015). In uncomplicated acute wounds, these phases are progressive and uneventful. Exudate in uncomplicated acute wounds contains growth factors, nutrients for cell metabolism, cytokines, matrix metalloproteinases (MMPs) and white blood cells, all of which help to stimulate healing (World Union of Wound Healing Societies (WUWHS), 2019). In normal wound healing, these factors are tightly controlled and are thus beneficial to the wound.

Box 2. Barriers to wound healing	
Diabetes	Pain
Obesity	Corticosteroids
Age (>60 years)	Immunosuppressants
Smoking	Malignancy
Impaired mobility	Poor concordance
Peripheral vascular disease	Stress
Malnutrition	Depression

Hallmarks of hard-to-heal wounds

Hard-to-heal wounds are stuck in a persistent and exaggerated inflammatory phase, where they are unable to regenerate new tissue and progress towards healing (Frykberg and Banks, 2015; Bjarnsholt et al, 2017). These wounds usually with high levels of exudate, are characterised by reduced growth factor signalling, with an associated increase in levels of degrading proinflammatory cytokines and proteases and reactive oxygen species (ROS); furthermore, fibroblast cell senescence is affected, with the cells becoming unresponsive to typical wound-healing signals and less able to proliferate (Telgenhoff and Shroot, 2005; Martin and Nunan, 2015). Meanwhile, the release of tissue inhibitors of metalloproteinases (TIMPs) is reduced, and the wound bed becomes more alkaline, which impairs fibroblast proliferation (Shukla et al, 2007). This leads to the protease-mediated destruction of vital components of connective dermal tissue, such as collagen and fibronectin. The diminished proliferative capacity of fibroblasts in hard-to-heal wounds is directly correlated with the failure of a wound to heal (Frykberg and Banks, 2015).

Hard-to-heal wounds are prone to infection and biofilm formation. A biofilm is a community of multispecies microbes protected within a protective matrix of sugars and proteins (Phillips et al, 2010), which makes it difficult to treat (Murphy et al, 2020). A vicious cycle ensues of chronic and protracted inflammation, coupled with increased exudate production, leading to further biofilm development. Biofilm is implicated in the stimulation of chronic inflammation (WUWHS, 2016) and is thought to be present in at least 78% of hard-to-heal wounds (Bjarnsholt et al, 2017). It is often a precursor to overt infection and tends to form where exudate is not under control (Metcalf and Bowler, 2013).

If not managed, the corrosive proteolytic enzymes in the high-volume exudate associated with chronic inflammation can delay healing and damage the peri-wound skin. Trengrove et al (2008) suggested that chronic wound exudate should be regarded as a wounding agent in its own right because of its potential to damage the peri-wound skin.

In addition, the increased levels of MMPs in chronic wound exudate degrade the extracellular matrix (ECM), preventing cell migration and thus the wound's progression to the proliferative phase of healing. One of the defining features of hard-to-heal wounds is the alternating pattern of healing (which is often delayed) and skin breakdown or ulcer recurrence (Martin and Nunan, 2015).

Exudate

Exudate is produced during the inflammatory stage of healing (Lloyd Jones, 2014). When controlled (Faucher et al, 2012), it

helps create a moist environment, which aids cell migration and facilitates autolysis of damaged tissue, thereby promoting healing.

The volume and properties of exudate, such as its consistency, type, odour and colour (all of which must be documented), can indicate whether or not the wound bed is infected or inflamed (Faucher et al, 2012; WUWHS, 2019). The volume and type of exudate can vary and change throughout the wound healing process, again indicating its progression towards healing (WUWHS, 2019).

As stated above, a moist wound environment will promote healing. Therefore, it is important to achieve a moisture balance. Uncontrolled excess exudate is often associated with malodour, pain, infection and strikethrough, whereas a dry wound bed will interfere with autolysis and the nutrient flow necessary for epithelial cell migration and effective wound healing.

Quality of life

For patients and their families, the psychosocial cost of hard-to-heal wounds is immeasurable, with exuding, unhealed wounds impairing quality of life (Gibson and Green, 2013; Green et al, 2014; Murray, 2019). Hard-to-heal wounds, such as venous leg ulcers (the most commonly treated wound in the UK), have both physical and psychosocial effects, with patients often experiencing concomitant distress, sleepless nights, low self-esteem and depression (both clinical and low mood) (Jones et al, 2008; Guest et al, 2015). Leg ulcers, in particular, have a profoundly negative impact on mobility and quality of life (Gonzalez de la Torre et al, 2017). Having a chronic wound with no endpoint in sight disrupts daily lives, often resulting in a loss of independence and/or control, as symptoms make it difficult to plan beyond the next dressing change.

Frequently reported patient issues associated with poor control of symptoms of hard-to-heal wounds include discomfort, pain, malodour, leakage (Jones et al, 2008; Faria et al, 2011) and reduced ability to perform daily activities, including work, shopping, cooking and socialising with family and friends (Gorecki et al, 2009). Uncontrolled exudate can be particularly damaging, as it causes malodour as well as excoriated and macerated peri-wound skin, which adds to the burden of living with a hard-to-heal wound, presenting a key challenge for health professionals (Jones and Barraud, 2014).

In situations where exudate is poorly managed, patients can quickly lose confidence in the treatment regimen, which affects adherence, a specific challenge with prolonged compression therapy (Gardner, 2012). Many patients are extremely concerned about dressings leaking, as exudate can stain clothes, bedding or furniture, causing feelings of being unclean and leading to withdrawal from social contact (Tickle, 2016). Assessment of the patient's home situation and how likely it is they will adhere to the mutually agreed treatment plan will help determine which wound management therapies should be selected.

Wound management

The foundation of any management plan, which should be devised in collaboration with the patient wherever possible, is to treat the underlying wound aetiology. This is supplemented by local wound treatment, which includes adequate preparation of the wound bed to accelerate healing (Wiegand et al, 2011). A wound bed that has not been prepared for healing with thorough cleansing and debridement (Mahoney, 2020) will most likely contain slough, devitalised tissue and biofilm, and produce a high volume of exudate (WUWHS, 2019), making it hard to heal. Wound debris such as pus, slough, extracellular products, biofilm and exudate must be removed, as these provide an ideal medium for microbial growth (Edward-Jones and Flanagan, 2013).

Role of dressings

Dressings alone do not heal wounds, but, rather, help to provide an environment that is conducive to healing (Browning, 2014). Importantly, they also help promote patient comfort and quality of life (Romanelli and Weir, 2014). Dressings are still the mainstay for the management of wound exudate. The WUWHS (2019) consensus document on exudate provides guidance on the types of dressing that can be used to manage moderate-to-high volumes of exudate, namely, those with alginate, carboxymethylcellulose (CMC), foam and superabsorbent polyacrylate (SAPs) as the main ingredients. These absorbent dressings should be able to prevent leakage and increase wear times to protect the wound bed and peri-wound skin. The dressing should conform to the wound bed, be comfortable and, as a result of exudate absorption, help to reduce any malodour. This will avoid disturbing the wound healing process (Rippon et al, 2015) and reduce the potential for distress and pain at dressing change (Solowiej and Upton, 2012).

Superabsorbent dressings

Superabsorbent (SAP) dressings have a greater absorption capacity than traditional foam dressings, whose fluid handling capacity can be suboptimal (Hughes and Jones, 2017), particularly under compression, allowing leakage of exudate and resulting in maceration (Schulze et al, 2001). SAPs, with their high fluid retention capacity, can be a useful adjunct under compression when a venous leg ulcer is heavily exuding, causing strikethrough between dressing changes. SAPs can maintain fluid-retention capacity under compression, while also providing additional cushioning (WUWHS, 2019). Although increased wear time is important (particularly during the COVID-19 pandemic), this should not be the primary driver. If, for example, the wound is infected or the patient is in pain or distressed, the dressing must be reviewed. Nonetheless, this must be balanced with the need to consider the importance of undisturbed healing (Rippon et al, 2015), and reducing the number of painful dressing changes (Docking et al, 2018).

SAPs also help reduce the concentration of inflammatory cells in the wound bed, as they can bind wound exudate and lock it within their core due to their wicking action (Faucher et al, 2012; Jones and Barraud, 2013). In this way, the unwanted components of exudate—bacteria, proteases and inflammatory mediators—are trapped, which inhibits microbial growth (Wiegand et al, 2011) and reduces MMPs levels, as well as avoiding potential leakage and the associated risk of maceration. Therefore, they provide

a moist wound environment conducive to wound progression and healing.

Kliniderm superabsorbent dressing

Kliniderm superabsorbent is a dressing that can be used as either a primary or secondary layer. It is indicated for the control and removal of excess exudate in moderately to heavily exuding acute and chronic wounds. Due to its ability to handle MMPs and sequester bacteria in chronic wound exudate (Westgate and Thomas, 2016), it is classed by the Drug Tariff as both a protease modulator and a superabsorbent dressing. Kliniderm superabsorbent is easy to use and, due to its low profile, can be applied under compression bandaging. Its high absorbency can result in fewer dressing changes being required, which is beneficial to wound healing, the patient experience and NHS costs (Wicks, 2017; Barrett et al, 2020).

Kliniderm superabsorbent dressing has a four-layer construction, with a hydrophilic wound contact layer, an intermediate layer, an absorbent core and a fluid-repellent backing layer, which is held together with a hypoallergenic seal, removing the risk of reactions to the glue used. It has the capacity to absorb large amounts of exudate and hold it within its core, preventing transfer of fluid back onto the peri-wound skin, thus reducing leakage, maceration and irritation (Barrett, 2015; Stephens, 2020).

Case studies

Case study 1

This case concerns a 95-year-old woman with wet wounds on both legs. The treatment and outcome for each leg is described in turn here.

The patient presented with a high fluid loss from multiple leg ulcers on her left leg (*Figure 1*). She had a history, of several years' duration, of painful leg ulceration (the self-reported pain score was 7 out of 10), involving hyperkeratosis throughout the lower left leg. She also had osteoarthritis and walked using a Zimmer frame. Previous treatments included topical steroid therapy for dermatitis and hydrofibre dressings covered by silicone foam, orthopaedic wool padding and light bandaging. Daily dressing changes were required to avoid strikethrough. The patient lived in a nursing home but was able to care for herself almost independently.

The leg ulcers were assessed by a tissue viability consultant, who undertook a Doppler assessment and ankle brachial pressure index (ABPI), with a score of 0.5. This, combined with the presence of leg pain, precluded the use of compression therapy as the ulcers were of mixed aetiology, confirming the vascular assessment made 8 months previously. The patient declined referral for further vascular investigation. The constant exudate had caused maceration and dermatitis, and the daily dressing changes added to the patient's pain and discomfort. The aim was to manage the exudate, reduce pain and eventually heal the wounds.

Given the multiple number of ulcers present (*Figure 1*) and the discomfort caused by the dermatitis, it was not possible to measure the wounds. The main wound was over the lateral malleolus, but the dermatitis was circumferential from below the knee to the foot. The wounds were all 100% sloughy. The patient's quality of life was affected due to the pain, which was severe, in addition to the malodour. She was concerned that the odour would upset her family when they visited.

Following assessment, the patient's leg was cleansed with antimicrobial fluid, and an emollient was applied. The leg was then dressed with Kliniderm superabsorbent dressings. The dressing-change frequency decreased from daily to three times a week in the first 7 days, at the end of which time the pain score had reduced from 7 to 4. The maceration had reduced and the dermatitis was not as red, although some hyperkeratosis was still present (*Figure 2*). There had been no occurrences of strikethrough due to the dressing's efficient exudate management, unlike previous dressing regimes.

The dressing was changed twice during the second week of treatment. After 2 weeks, the maceration and dermatitis had improved further, the pain score had reduced significantly and was now 2, and the surrounding skin and wound appeared healthier. The Kliniderm superabsorbent dressing protected the skin by absorbing and retaining the exudate. Once-weekly dressing changes were now required due to the effectiveness of Kliniderm superabsorbent in managing the exudate. The emollient therapy also continued for 4 weeks.

Figure 1. Case 1 (left leg): The leg is very wet from dermatitis and maceration.

Figure 2. Case 1 (left leg): Day 7 of treatment with Kliniderm superabsorbent.

The dressing was comfortable and absorbed all the fluid between dressing changes. There was no pain associated with the dressing, either in removal or when in situ.

The patient was able to see her visitors with confidence, as any fluid loss was never visible and the odour had disappeared by week 2.

This patient's right leg was also affected by ongoing fluid loss, which was due to inflammation from the dermatitis, but this was due solely to dermatitis and involved a much smaller area (*Figure 3*). The leg was extremely painful (the self-reported pain score was 8 out of 10) and constantly wet due to the dermatitis. Again, the previous treatment had comprised steroid therapy and hydrofibre dressings, a silicone foam, padding and light bandaging, but these failed to manage the dermatitis and relieve her pain, resulting in the skin becoming sore and breaking down following contact with the proteases in the exudate. The ABPI for this leg was also 0.5. The wounds were from mid-calf to the toes.

The patient was assessed by a TVN consultant, who applied a zinc paste bandage containing 63% oxide BP and 2% Ichthammol on the affected skin, and Kliniderm superabsorbent was used to absorb the excess fluid. Ichthammol provides a moist wound-healing environment, helps to reduce skin irritation, soothes and protects the surrounding skin and is used in the management of leg ulcers and to treat chronic eczema and dermatitis.

Figure 3. Case 1 (right leg): At presentation. The leg is very wet and painful.

The dressing was changed twice weekly; there was no strikethrough at dressing changes. As the skin was no longer coming in contact with the exudate, its condition improved, and the dermatitis settled.

After 2 weeks of treatment with Kliniderm, the dermatitis had cleared completely, and the pain score reduced to 2 (*Figures 4* and *5*). By week 3, the leg was completely dry. The ulcer continues to heal.

Figure 4. Case 1 (right leg): By week 2, the wounds are almost completely dry and healing. Icthopaste treatment continues, and pain is no longer a problem.

Figure 5. Case 1 (right leg): By week 2, the leg is looking healthier and is healing: there is no dermatitis or pain, and the skin looks healthy.

Case study 2

An 82-year-old woman had a wound on the left lateral malleolus that had developed while she was lying in bed (she constantly lay in bed in the same position at night). Her GP and practice nurse had diagnosed and treated the wound as a leg ulcer (*Figure 6*) and not a pressure ulcer, and she was advised to keep her legs elevated. This is a common misdiagnosis but its round shape and location over the ankle bone is indicative of pressure injury. Although elevation was helpful, the single most important advice for this wound should have been to remove the pressure through offloading. The patient lived in her own home and was fairly independent, despite having limited mobility.

The patient had some mild oedema in her left foot, which was not related to heart disease (confirmed by her GP). The wound was malodorous and painful (colonised but not clinically infected), but she continued with her everyday activities and pastimes, in an attempt to prevent her wound from impairing her quality of life.

The patient used a Revitive machine, which is designed to improve circulation by stimulating the muscles in the legs and feet with professional-strength electrical muscle stimulation. For this reason, she did not want her foot to be covered with bandages. A double layer of blue line tubular bandage, positioned from toe to knee, was used to support the prescribed dressing, which was a hydrofibre dressing and a foam dressing with a silicone border.

The patient's daughters undertook a 60-mile round trip to take her to the local practice nurse for the twice-weekly dressing changes required to avoid strikethrough. The woman was independent but relied on her daughters for transport.

The GP practice referred the patient to a TVN consultant. Doppler and an ABPI assessment revealed a result of 0.65, which is indicative of peripheral arterial disease. The pulse was bi-phasic. The capillary refill time was slow, at 4 seconds, but the foot was warm to touch, indicating that there was still a good blood supply. The patient's self-reported pain score was 8 out of 10. The peri-wound area was red due to contact with proteases in the wound exudate. Proteases are enzymes that damage skin cells and 'burn' the skin. The nurse consultant diagnosed the wound as a category 3 pressure ulcer, and following conversation with the patient, concluded that it had resulted from her lying still in bed for long periods on her left side. There was an element of arterial disease, which would increase the potential for pressure injury over the feet. Her skin elsewhere was not showing signs of pressure injury.

To address the underlying aetiology, the patient was advised not to lie on her left side. To avoid this, she placed a pillow under her back when in bed to stop her from rolling onto her left side.

The wound was round, which is common for pressure ulcers over the malleolus, due to the shape of the bony prominence beneath. It was 100% sloughy and was classified as a category 3 pressure ulcer measuring 4.5 cm in diameter.

The patient was distressed that she could no longer lie on the side that was most comfortable but was informed that if she continued to expose it to pressure, the wound would not heal. She was provided with a foam dressing for the right lateral malleolus (the non-injured foot) and was advised to try to keep that ankle for any pressure.

The decision was made to switch from foam to superabsorbent in order to control the exudate and to provide more padding over the malleolus. The wound was dressed with Kliniderm superabsorbent (*Figure 7*). The first dressing change took place after 1 week, at which point the peri-wound skin looked healthier (*Figure 8*), and the patient's self-reported pain score reduced from 8/10 to 5/10. The redness had disappeared. The circumference of the wound remained at 4.5 cm, but the wound bed was filling. The wound had approximately 95% slough, but the granulation was showing through. The wound was cleansed with an antimicrobial cleansing solution, as it was too painful to

Figure 6. Case 2: The wound before Kliniderm superabsorbent was first applied: its edges were painful with surrounding redness due to the pressure. The wound was sloughy and classified as a category 3 pressure ulcer.

Figure 7. Case 2: After 1 week. Kliniderm superabsorbent (the dressing is held by the patient).

Figure 8. Case 2: The skin is no longer painful as the dressing has absorbed and retained the exudate.

debride with a monofilament pad. It is not known whether an antimicrobial cleansing solution was used previously.

At the next dressing change, 1 week later, the patient's pain had reduced to 2 out of 10. The wound was no different in width or in the amount of slough, but the wound bed continued to fill. The patient was delighted to be almost completely pain-free and no longer had to ask her daughters to take time off work to drive her to her local GP for the dressing changes, as the specialist TVN visited at home weekly in order to change the dressing and monitor the wound.

There were no obvious signs of distress on the patient's part, but her daughters were very obviously concerned. The wound did not heal in the evaluation period but continues to slowly heal.

Case study 3

Mrs K is a 79-year-old woman with two long-standing, recurrent ulcers on the right leg in the gaiter area due to venous disease. She has had these wounds for many years, too many for her to remember, and the one in the present case had recurred 6 months previously. Mrs K is married with two children and six grandchildren, all of whom visit regularly; they are concerned for her welfare and care for her. Her husband had a stroke, but she finds it difficult to cope due to her leaky and ulcerated legs and, although she attended clinic 3 times a week, there was still strikethrough on her bandages at each dressing change. Mrs K worked at a newsagents part-time, for 15 hours a week.

She also finds it difficult to socialise, as she is always concerned that fluid will come through her bandages, causing, as she states it, 'a snail trail across my friend's floor'. She changed her dressing daily in order to cope with the heavy fluid loss.

Mrs K needs to continue to work and is limited by the leg ulcer. She is obese, a non-smoker and is otherwise generally quite healthy. Her leg was dressed three times weekly in the clinic, and her daughter changed the dressing on the days she was not at clinic and on days when the exudate was not held by the dressings. The dressings were hydrofibre held in situ with orthopaedic wool and retention bandage.

Figure 9. Case 3: The 100% sloughy wound at presentation, with a slimy biofilm.

The wound almost circumnavigated the gaiter area, was 100% sloughy and malodorous due to colonisation (*Figure 9*). It was not considered possible to use Doppler to calculate the ABPI, as the presence of oedema might have caused inaccurate readings. There was difficulty in assessing whether the size of the limb was due to lymphoedema, oedema or obesity. Stemmer's sign was negative, so this was not thought to be lymphoedema, and there was no pitting oedema. Therefore, the large leg was thought to be a combination of venous oedema and obesity. However, her foot was warm to the touch, and capillary refill was brisk. ABPI had been assessed 6 months previously and was well within normal limits at that time (1.2 for the left leg and 0.9 for the right leg), which would suggest Mrs K was suitable for compression therapy. However, it should be remembered that arterial disease can be progressive and the ABPI measurement should be attempted once there is a reduction in oedema.

Mrs K's obesity was partly responsible for the problem of non-healing (Gates et al, 2005), but she was unwilling to listen to advice about weight loss as she felt she had 'enough to worry about with a sick husband.'

The aim of treatment was to reverse the venous hypertension and, thus, reduce the oedema, while managing the wound fluid loss that was of such great concern to the patient. In order to do this, and in light of previous vascular assessments, a short-stretch compression bandage was applied from toe to knee with a 50% overlap and, due to an ankle circumference measurement of over 25 cm, a second short-stretch bandage was applied in the opposite direction, from ankle to knee (Williams, 2002). Applying two layers on a large limb ensures that the pressure applied by the bandages is at a therapeutic level.

It was also necessary to use a dressing that was capable of managing the high levels of exudate. This required a superabsorbent dressing. Kliniderm superabsorbent was selected, as it had been shown to be effective under compression bandaging (Stephens, 2020). It was used as a primary dressing.

Mrs K was reassessed by the TVN at 3 days, then 6 days and then weekly for a further 3 weeks. Exudate was managed extremely well, with the dressing retaining any excess fluid. At the start of the treatment, the wound was obviously covered by a biofilm in 100% slough. This was indicated by the slimy appearance of the wound. Although it appeared superficial, it actually sloped to a fairly deep level, which was impossible to measure. The wound progressed at each visit, with slough visibly reducing gradually until the final wound assessment (*Figure 10*), when there was 100% granulation and no odour or pain. The depth seen in centre of *Figure 9* had filled level with the skin surface, indicating a wound in an excellent healing state. Further, the surrounding skin had not been too problematic at the beginning of treatment, but had certainly improved by the final visit, although there was no reduction in oedema.

Following the initial assessment, the dressing changes went from daily, to twice weekly after the third visit and then

Figure 10. Case 3: After 4 weeks of treatment with Kliniderm, the ulcer was clean and healing.

weekly. Any pain associated with the wound had disappeared. Mrs K found the dressings comfortable, and the Kliniderm superabsorbent did not feel bulky even after absorbing fluid for over a week. She was completely free of any pain associated with dressing change.

Mrs K tolerated the compression very well and, although the wounds had never been very painful (the pain score remained at 0), the legs had previously felt heavy and uncomfortable, but she said that this discomfort had gone.

After 4 weeks, the ulcer was clean and healing (*Figure 10*). There was 100% granulation, with fluid loss being greatly reduced. There was no reduction in the size of the limb, which confirmed that the large leg was due to obesity rather than oedema. Her quality of life improved, and she was able to see her friends and to slowly return to work at the newsagents, although the number of hours per week was reduced to 10.

With the use of Kliniderm superabsorbent dressings and compression, fluid loss was minimised, so that dressing change was required only weekly instead of daily, and she was able to visit her friends without fear of oozing on their floor. The reduction in fluid loss was possibly largely due to the compression, but the Kliniderm superabsorbent dressing supported this by reducing the potential to leak so that the compression could be maintained. There was no discernible odour at this point.

It is not always the healing that is the patient's problem; pain, fluid loss and odour can cause stress, which is a physical reaction that reduces the lumen of the arterioles, which in turn reduces the amount of oxygen and nutrients available to the wound. When the stress is reduced, the wound is more likely to heal (Gouin and Kiecolt-Glaser, 2011). The treatment made it easier for Mrs K to care for her husband, as her walking improved and she spent less time having her dressings changed.

The improvement in her wound was due to compression and absorption of fluid, which increased her confidence to go out more and mobilise. She said she was delighted to be 'back on the scene!'

Conclusion

Chronic or hard-to-heal wounds are on the increase largely due to changing demographics and complexity of patients and their wounds. We are increasing our understanding of wound healing and the major factors impacting on their ability to heal in often exceedingly difficult and challenging circumstances. For the patient this can often translate to living with wounds that are wet, malodorous, and painful, adversely affecting their quality of life.

Exudate remains one of the main challenges for health care professionals in managing wounds particularly in the community where visits must be planned in advance. Health care professionals and patients need to have confidence in the capability of the dressings selected since dressings remain the mainstay of exudate management, together with management of the aetiology. Superabsorbent dressings play a vital role in the management of moderate to highly exuding wounds.

All three patients whose cases were presented agreed that the levels of exudate had reduced with the use of Kliniderm superabsorbent, and that, when odour had been present, the superabsorbent dressing had controlled it. They felt more confident about socialising. **CWC**

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