

Managing wound pain in patients with burns using soft silicone dressings

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Pain is a significant issue in wound care, causing distress to patients and presenting an ongoing challenge to nurses and clinicians. Wound care at dressing changes can be minimised by using the correct dressing. Use of soft silicone products can reduce pain at application, during wear and on removal, as well as minimising trauma to the wound.

Pain is a biopsychosocial phenomenon, and there are a number of emotional factors that can influence the experience of pain such as the extent of the injury and its management. Anxiety and depression can also lead to a greater experience of pain (Upton, 2011).

Acute pain is usually nociceptive in origin — it is a symptom of injury or illness and usually ceases when the underlying problem is resolved (Fowler, 2003). Acute pain provides an important protective function, warning of injury, or harm and the need to limit further tissue damage, but it is how this pain is managed that is important.

There are four main types of pain, which need to be understood in order to manage patients' pain effectively:

- ▶ Background pain: this is felt intermittently or continuously and may be exacerbated by certain events.
- ▶ Breakthrough or incident pain: this often occurs as a result of sudden movement or activity such as standing
- ▶ Procedural pain: this relates to specific procedure such as wound cleansing and often continues for some time afterwards
- ▶ Anticipatory pain: described as incurring or intensifying pain through expectation (Woo, 2008).

Causes of pain in wound care

Dressing-related pain can sometimes be worse than the pain from the wound. Benbow (2010) suggests that wound and dressing-related pain is underestimated and poorly managed and may lead to extended healing times. She identifies that the most common causes of pain include removing dressings that stick to the wound bed, skin stripping of periwound skin and tissue maceration and/or excoriation due to inadequate management of wound exudate.

Acton (2008) supports this and suggests that pain management at dressing changes still appears to be an issue, which is poorly managed in clinical practice, causing the patient considerable distress. She says that in her experience, dried-out dressings and adherent products are the most likely to cause pain and trauma at dressing changes.

In addition, several authors have identified that interventions such as dressing removal, wound cleansing, debridement, and inappropriate dressing selection can all contribute to wound-related pain (Jones, 2004; Lloyd-Jones, 2004; Woo et al, 2009).

Burn pain

In the author's area of clinical practice, pain is a significant issue. The immediate pain that follows a burn injury is due to the stimulation of pain-sensing nerves in the skin (nociceptors).

Nerve endings that are completely destroyed will not transmit pain, but those that remain intact will trigger pain throughout the time and course of treatment, as will nerves that are regenerating. Burns are not uniform in depth and even deep full-thickness burns can have superficial edges which are often overlooked and can be very painful.



Figure 1. Advazorb Silflex Lite used on a burn on a patient's forehead.

Burn injuries cause intense and prolonged pain, made worse by the need to change dressings frequently to prevent infection and aid healing. The time of greatest pain is usually experienced during therapeutic procedures. Patients with severe burns who require dressings over a long period of time may continue to experience pain despite an escalation in analgesia (Latarjet, 2002).

In the short term, poorly managed pain may exacerbate burn hypermetabolism, leading to immunological impairment and sensitivity to infection (Judkins and Clark, 2010). Long-term prolonged pain will increase the risk of developing depression or post-traumatic stress disorder (PTSD) (Taal and Faber, 1997). This is supported by Choiniere (2001) who adds that a key objective is to avoid patient suffering and that under-treated pain in burn patients can result in non-concordance with hospital treatment. He says that this can disrupt care and increase the risk of PTSD.

Debridement, cleansing and redressing of wounds stimulate the already regenerating nerve endings which are already more sensitive to pain and may intensify the feeling of pain. In addition, these procedures need to be repeated for weeks or months. Inadequate control of pain before dressing changes could result in the patient's anticipation of pain, thereby increasing anxiety and

suffering (Judkins and Clark, 2010). Judkins and Clark (2010) state that this happens not only in major burns, but that minor burns are also not immune to the long-term sequelae of badly managed pain.

Byers et al (2001) identified that procedural pain is always much greater than resting pain. The most important factor in achieving pain control is not perhaps the analgesia component, but how the wound itself is managed. If a wound is not managed actively and appropriately, it has more potential to become chronic and therefore the patient may develop chronic wound pain. Given that burn pain is one of the most extreme types of pain, the emphasis must be on using products that limit the experience of pain (Edwards, 2009).

Physiological effects of pain on wounds

An increased level of stress and heightened anxiety have been demonstrated to lower pain threshold and tolerance, as the person may become more vigilant to pain signals. The result is a vicious cycle of pain, stress/anxiety and worsening pain (Woo, 2010).

Anxiety has been correlated with increased wound-related pain both at dressing changes and between changes. Aaron et al (2001) demonstrated that anxiety is a significant predictor of procedural pain during dressing change and accounts for 40% of the variance of reported burn-related pain.

This is supported in a recent study by Woo (2010), who measured anticipatory pain and anxiety in 96 patients with wounds. He found that patients who experienced higher levels of anxiety anticipated more pain and experienced more intense pain during dressing changes than patients with lower levels of anxiety.

Vuolo (2009) suggests that the impact of pain on the patient includes loss of sleep, reduced appetite, reduced mobility, depression, anxiety and loss of independence. Solowiej et al (2009) suggest that the body of evidence to suggest that stress and anxiety can delay wound healing is growing. Stress can lead to raised levels of cortisol which can have a negative impact on immunity and the body's inflammatory response (Richardson and Davies, 2011). Woo (2010) identified that wound pain constitutes a psychological stressor that leads to the release of vasopressin and glucocorticoid. This leads to compromise in terms of delivery of oxygen and nutrients, as vasopressin is a vasoconstrictor. Cell regeneration, growth factors and the immune response are negatively affected by glucocorticoid.

Psychological effects of pain

It is essential to recognise the significance of the clinical technique used when dressing a wound for the first time. Inadequate pain management at this stage will have lasting effects. The patient may dread subsequent dressing changes and lose confidence in the care team (Latarjet, 2002). Fletcher (2010) suggests that patients may remember procedural pain for decades and develop elaborate coping strategies to prevent clinicians from inflicting further pain during a dressing procedure. This leads to the development of anticipatory pain.

This is supported by Melzack (1996) who states that the anticipation of pain at dressing removal can lead to an increase in pain intensity, particularly if the patient has experienced this on a previous occasion. Therefore, it is important that the right choice of dressing is identified from the beginning.

Management of pain

Analgesia aside, Benbow (2010) argues

that a fundamental principle of wound management should be the selection of products that minimise pain at all stages of the process — during application, in use and particularly on removal. Woo (2010) identifies that dressing changes are painful when the contact layer adheres to the wound bed due to dried out materials, aggressive adhesives, granulation tissue and capillary loops growing into the product, or from the glue-like nature of dehydrated exudate. In a study by Moffatt et al (2002) in which 3,918 clinicians across 11 countries were surveyed, pain-free removal was ranked the most highly desired characteristic of a dressing.

Price et al (2008) surveyed patients with chronic wounds and identified that 62% of patients reported that their pain took up to two hours to subside after a dressing change. This is supported by Meaume et al (2004) who state that pain is often related to inappropriate dressing selection and that the selection of a suitable, non-adherent dressing will result in greater patient acceptability and is an important part of the holistic approach to treatment. Benbow (2010) agrees and suggests that the challenge to nurses is correctly identifying the need of the wound and matching this to an appropriate dressing.

Dressings often need to be soaked off to prevent trauma. Briggs et al (2002) suggest that if soaking is required for removal, if there is bleeding or trauma at the wound, or if pain is a problem on removal, the choice of product should be reconsidered. Vuolo (2009) suggests some useful strategies to consider when selecting dressing products:

- ▶▶ Ensure product is correctly matched to wound type
- ▶▶ Select products with low-adherent properties
- ▶▶ Ensure adhesive borders and tapes are only used on robust peri-wound skin

- ▶▶ Apply and remove products according to manufacturers' guidance
- ▶▶ Use a non-sting barrier spray to reduce the risk of skin stripping
- ▶▶ Review dressing choice if it is causing pain.

Soft silicone dressings

Soft silicone technology has now been developed to minimise the problems of pain at dressing changes, protect the surrounding skin, provide atraumatic dressing changes and promote comfort during wear (Hampton, 2010). Timmons et al (2009) in a series of case studies demonstrated that the use of silicone-based treatments provided effective treatment of patients' wounds, without causing excessive trauma to the wound bed or surrounding skin. They add that the use of these dressings helps to improve the patient's quality of life, reduce anxiety and improve outcomes in terms of healing and prevention of wound-related complications.

A number of authors suggest that the use of soft silicone dressings has been demonstrated to reduce wound pain at dressing changes (Acton, 2008; Benbow, 2010; Upton, 2011). Benbow (2010) suggests that this is because the soft silicone dressings do not adhere to the wound surface or skin and, therefore, do not cause trauma or pain due to skin stripping.

Cost-effectiveness

Soft silicone dressings are often considered too expensive and their use is sometimes restricted. However, this perception is often based on the cost per dressing, rather than the total cost of care, ignoring nursing time as well as analgesia, which is charged through pharmacy and is not high on the radar of most community nurses. For example, if a dressing has adhered to the skin of a patient with a burn, an anaesthetic gas (usually



Figure 2. Burn on left foot after debridement.

nitrous oxide [50%] and oxygen [50%]) is often required to ease the pain of dressing removal, as well as requiring an additional member of staff to administer it. In addition, liquid oramorph is often prescribed to maintain levels of analgesia following the procedure. Even using rough estimates, it can be seen that the cost of a soft silicone dressing, which can be removed without pain or trauma, can easily be offset against the cost of analgesia and the nursing time it takes to carefully remove a dressing that has adhered to the wound bed.

Advazorb®

Advazorb® (Advancis) is a new range of patient-friendly absorbent foam dressings. This new dressing range comes in a variety of presentations that consist of hydrophilic foam with a soft silicone contact layer. There are bordered versions (Advazorb® Silflo) or non-bordered (Advazorb® Silfix). In addition, there are 'Lite' versions for light to moderately exuding wounds. The dressings are designed to promote protection of fragile tissue while maintaining optimum moisture levels to



Figure 3. Advazorb Silflo Lite in situ.

promote wound healing and pain-free dressing changes (Cook, 2011).

The Lite versions are particularly useful for burn wounds which are not wet wounds (as often believed), certainly not after the first 48 hours and, indeed, seldom in minor burns. The Lite versions are more mouldable and are able to be used in more difficult areas of the body (Figure 1).

Case report

The patient was a 73-year-old-man who spilled hot fat onto his feet while taking roast potatoes out of the oven. The burn was two days old when he was assessed. The left foot was assessed as superficial dermal and the right foot deep dermal (Figure 2). The wounds were extremely painful and he was having difficulty in walking.

All blisters and dead skin were debrided and the wounds were dressed using Advazorb Silflo Lite and Flamazine® (Smith & Nephew) on the left foot, and Atrauman® (Hartmann) and Flamazine on the right (Figure 3).

At review seven days later, the wound on the left foot was healed and the patient had managed to mobilise with no problem on this foot. He had experienced no pain at dressing changes. The right foot remained unhealed.

Conclusion

Obviously the author's experiences with this dressing are limited, but early use suggests that this product will play a useful part in reducing the pain experienced by patients with burns at dressing changes. A full evaluation of the product now needs to be undertaken before it can be added to the University of South Manchester burns formulary. However, dressings that do not cause trauma and pain present obvious benefits in this patient group.

Anticipation of pain is as much a problem as actual pain. If using soft silicone prevents this anticipation, it is likely that the overall pain experience of the patient may be greatly reduced. **WUK**

References

- Aaron LA, Patterson DR, Finch CP, Carrougher GJ, Heimbach DM (2001) The utility of a burn specific measure of pain anxiety to prospectively predict pain and function: a comparative analysis. *Burns* 27(4): 329–34
- Acton C (2008) Reducing pain during wound dressing changes. *Wound Essentials* 3: 114–22
- Benbow M (2010) Managing wound pain: is there an ideal dressing? *Br J Nursing* 19(20): 1273–74
- Briggs M, Torra I, Bou JE (2002) Pain at wound dressing changes: a guide to management. In: *Pain at Wound Dressing Changes. European Wound Management Association Position Document*. MEP, London
- Byers JF, Bridges S, Kijek J, Laborde P (2001) Burn patients pain and anxiety experiences. *J Burn Care Rehabil* 22(2): 144–9
- Choiniere M (2001) Burn pain: a unique challenge. *Pain clinical updates* 9: 1–4
- Cook L (2011) Advazorb foam range: providing clinical performance and cost effectiveness. *Wounds UK* 7(3): 68–72
- Edwards JA (2009) The use of Silflex in burn wound management. *Br J Community Nursing* 14(9): S32–36
- Fletcher J (2010) Managing wound pain during application and removal of dressings. *Br J Nursing* 19(20): S4–S6
- Fowler E (2003) Addressing the pain: plain talk about wound pain. *Ostomy Wound Manage* 49(9): 11–14
- Hampton S (2010) An evaluation of silicone adhesive shaped heel dressing. *Br J Nursing* 19(6): S30–3
- Jones M (2004) Minimising pain at dressing changes. *Nurs Stand* 18(24): 65–70
- Judkins K, Clark L (2010) Managing the pain of burn wounds. *Wounds UK* 6(1): 110–8
- Latarjet J (2002) The management of pain associated with dressing changes in patients with burns. *EWMA J* 2(2): 5–9
- Lloyd-Jones M (2008) Treatment of superficial wounds and management of associated pain. *Primary Health Care* 18(4): 41–6
- Melzack R (1996) *The Challenge of Pain*. Penguin, London
- Meume S, Teot L, Lazareth I, Martini J, Bohot S (2004) The importance of pain reduction through dressing selection in routine wound management: the MAPP study. *J Wound Care* 13(10): 409–13
- Moffatt CJ, Franks PJ, Hollingworth H (2002) Understanding wound pain and trauma: an international perspective. In: *Pain at Wound Dressing Changes. European Wound Management Association Position Document*. MEP, London.
- Price PE, Fagervik-Morton H, Mudge EJ et al (2008) Dressing related pain in patients with chronic wounds: an international patient perspective. *Int Wound J* 5(2): 159–71
- Richardson C, Davies S (2011) Psychological mechanisms of pain in acute and chronic wounds. In: Upton D ed. *Psychological Impact of Pain in Patients with Wounds*. Wounds UK London: 1–18
- Solowiej K, Mason V, Upton D (2009) Review of the relationship between stress and wound healing: part 1. *J Wound Care* 18(9): 357–66
- Taal LA, Faber AW, (1997) Burn injuries, pain and distress: exploring the roles of stress symptomatology. *Burns* 23(4): 288–90
- Timmons J, Gray D, Russell F (2009) Silflex soft silicone wound contact dressing. *Wounds UK* 5(2): 56–61
- Upton D (2011) Pain, wound care and psychology: the missing link? *Wounds UK* 7(2): 119–22
- Vuolo JC (2009) Wound-related pain: key sources and triggers. *Br J Nursing* 18(15): S20–S25
- Woo KY (2008) Meeting the challenges of wound associated pain: anticipatory pain, anxiety, stress and wound healing. *Ostomy Wound Manage* 54(49): 10–12
- Woo KY, Coutts PM, Price P, Harding K, Sibbald RG (2009) A randomised crossover investigation of pain at dressing change comparing 2 foam dressings. *Adv Skin Wound Care* 22(7): 304–10
- Woo KY (2010) Wound-related pain: anxiety, stress and healing. *Wounds UK* 6(4): 92–8

Key points

- ▶▶ Pain presents an ongoing challenge to nurses and clinicians.
- ▶▶ Problems at dressing changes can be minimised by using the correct dressing.
- ▶▶ Soft silicone technology has been developed to minimise pain at dressing changes, protect the surrounding skin, provide atraumatic dressing changes and promote comfort during wear.
- ▶▶ Anticipation of pain is as much a problem as actual pain. If using soft silicone prevents this anticipation, it is likely that the overall pain experience of the patient may be greatly reduced.