Developments in venous leg ulcer management

In this article...

- Why leg ulcer management is becoming increasingly complex
- How age, obesity and multiple co-morbidities can impact on treatment
- Taking patients' needs into account

Leg ulcers are a common problem but increasing co-morbidity makes them challenging to manage. Further research is needed to boost our understanding of complex wounds.

Factors such as an ageing population, increasing rates of obesity and complex co-morbidities are complicating the management of venous leg ulcers. There is a need to improve leg ulcer care, both through the skill of practitioners and the overhaul of services. Best-practice guidelines must be followed while taking into account the needs of patients, who have much-reduced quality of life due to their condition. Many aspects of leg ulceration are not well understood and more research in areas such as surgical techniques and compression materials is needed to improve outcomes for patients.

Venous ulcers are caused by chronic venous insufficiency. Venous blood reaches the heart from the lower leg largely through the action of the calf muscle pump, while valves in the superficial and deep veins prevent backflow. Any damage to the valves, for example from trauma, will render them unable to prevent backflow and venous blood will pool in the lower leg. This pooling leads to venous congestion and vasodilation, which, in turn, pushes fluid out of the blood vessel into the tissues as oedema. Red blood cells also leak into tissues causing staining, known as haemosiderin staining, which is characteristic of chronic venous disease (Morison and Moffatt, 2004). Over time, these events lead to skin changes and, in many cases, eventual ulceration of the leg (Anderson, 2006).

The key management principles for venous leg ulcers are compression, leg elevation and exercise (Royal College of Nursing, 2006). However, many aspects of leg ulceration are not clearly understood and research is needed to ensure patients have the best chance of healing and remaining healed for as long as possible.

Causes of venous ulcers

Venous ulcers are caused by chronic venous insufficiency. Venous blood reaches the heart from the lower leg largely through the action of the calf muscle pump, while valves in the superficial and deep veins prevent backflow. Any damage to the valves, for example from trauma, will render them unable to prevent backflow and venous blood will pool in the lower leg. This pooling leads to venous congestion and vasodilation, which, in turn, pushes fluid out of the blood vessel into the tissues as oedema.

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Venous disease affects lymphatic drainage and oedema is often a result of a combination of problems in both the lymphatic and the venous system (Tiwari et al, 2007).
Compression therapy

The key treatment for venous leg ulcers to aid healing and prevent recurrence is graduated compression therapy. The underlying theory for this relates to Laplace’s Law, which states that the pressure on the limb is determined by the bandage width (usually 10cm) as well as the application techniques of stretch (50%) and overlap (50%) – assuming the leg has a graduated profile with the ankle being smaller than the calf (Moffatt et al, 2007).

In recent years there has been much research on the way materials behave when applied as bandages or hosiery to the leg. Partsch (2005) among others (Mosti et al, 2008; Partsch et al, 2006) introduced the concepts of static stiffness and dynamic stiffness in an attempt to find a way of standardising the measurement of material performance. Using a pressure monitor, the difference between the sub-bandage pressure is measured when the person is lying down and standing up (Partsch, 2005). This pressure is always measured at the base of the calf muscle, where it joins the Achilles tendon (known as point B1) to ensure measurements are consistent (Partsch et al, 2006).

One interesting point to come out of this ongoing research is that there is not necessarily a clear difference between the effects of long-stretch (elastic) bandages and short-stretch (inelastic) bandages.

5 key points

1. Leg ulcers are complex wounds and should be managed by skilled practitioners
2. Factors such as age, obesity and co-morbidity can affect the effectiveness of treatment
3. A better understanding of the benefits of different compression materials is needed
4. Surgery may be appropriate for some patients
5. Quality of life is an important issue and patients’ needs should be taken into account
and short-stretch (inelastic) bandages. Multiple layers of elastic materials may act in a more inelastic way when layered with other elastic bandages. For compression hosiery the materials used determine the stiffness of the garment and there are differences between manufacturers (Best Practice Statement, 2005). The clinical relevance of the behaviour of these materials relates to working and resting pressures, which will have an impact on patient comfort. For example, stiffer materials will give higher working pressures, which may have a greater impact on calf muscle function and oedema reduction (Partsch et al, 2006).

Surgery
Surgical intervention has an important role in managing venous disease and reducing recurrence of leg ulceration. Barwell et al (2004) randomised 500 patients to have either compression therapy alone or superficial venous surgery and compression therapy. There was no advantage to having surgery with active ulceration but surgery after ulcers had healed reduced recurrence from 28% to 12% over a year.

Interestingly, when the team published results at four years, recurrence was 56% in the group who had not received surgery and 31% in those who had, although they were unable to ascertain if the patients in the follow-up had been wearing the class 2 compression hosiery as prescribed (Gohel et al, 2007). Unfortunately, due to comorbidities, the researchers found that 46% of patients were unsuitable for surgery before the study began. Guidelines from the Scottish Intercollegiate Guidelines Network (SIGN, 2010) point out that there is a lack of good-quality evidence on the impact of deep venous surgery.

Obesity
Obesity is an increasingly important factor in venous ulcers. National guidance on obesity (National Institute for Health and Clinical Excellence, 2006) recommends diet and exercise to help people manage weight loss; surgery is generally recommended only for those with a body mass index greater than 40. Padberg et al (2003) conducted a study of 39 limbs in 20 patients who were obese and had clinical signs of severe venous disease. On investigation with Duplex ultrasound, they found 24 of the 39 limbs had little or no venous abnormalities. As such, they concluded that the obesity had caused venous deficits, probably due to the pressure put on the veins. They likened it to a type of ascites in the tissue (Padberg et al, 2003), compounded by excess fatty tissue compressing lymphatic vessels and veins (Stigant, 2009). There was also evidence of congestion and scarring in lymphatic tissue, which would further reduce capacity.

The researchers did find that concordance with compression therapy was poor for active and healed ulcers, and this was partly due to physical factors such as patients being unable to reach (or see) their feet. The obesity was linked to varying degrees with heart failure, which further complicated patients’ ability to manage therapy and physical activity.

The study did not investigate healing rates but the demographic data indicated that time to healing for patients was in excess of seven months and about 50% had ulcer recurrences within three years. The researchers’ overall conclusion was that morbid obesity itself contributes to venous disease.

Tobon et al (2008) carried out a literature review on obesity and venous disease and found that deficits in vitamins A and C, as well as zinc and protein, are common in patients affected by both conditions. They also established that a significant proportion of people who are obese and included in studies are at risk of malnutrition, but it is unclear whether obesity adds specifically to the deficits and whether the vitamin deficits in particular contribute to more prolonged ulceration in this patient group.

It should be noted that even surgical treatment of obesity can lead to vitamin and protein deficiencies (Wardle et al, 2011). NICE guidance (2006) stresses the importance of helping people to understand the health implications of obesity rather than focusing on how they look, which could reinforce low self-esteem. Stigant (2009) suggested that linking weight loss to specific effects such as reduced swelling can often be a useful motivating factor.

The National Bariatric Surgery Registry (NBSR, 2010) concluded in its recent report that surgery was a cost-effective way of improving health outcomes for this group of patients. The report indicated that, compared with diet and pharmacotherapy, bariatric surgery can induce sustainable weight loss in the patient who is morbidly obese. However, Wardle et al (2011) suggested the recommendations from this report on surgical interventions over diet and pharmacological treatment can leave many medical practitioners questioning the guidance in practical terms. Surgery can lead to some rare mechanical complications, infection, haemorrhage, strictures and nutritional complications. Without some form of intervention for example, how feasible is it to ask people with a BMI over 35 to follow diet and exercise alone when they have lower leg problems and low self-esteem? This highlights the potential importance of early intervention for the identification and management of lower leg oedema.

Other problems in treating this group of patients are highlighted by Booth et al (2011); they reviewed National Patient Safety Agency reports and found issues with inadequate provision of equipment, care pathways and obesity-specific training. Generally, equipment in clinics/surgeries is suitable for patients weighing up to 180-190kg; couches/chairs are not wide or strong enough for patients exceeding this weight. This has implications for nurses managing this group and may indicate why some patients do not receive adequate management of their chronic oedema and associated venous disease/leg ulceration.

Quality of life
The impact of leg ulcer management on the way patients manage their activities of daily living needs to be assessed carefully and empathetically. Wearing bandages for up to a week will make it difficult to attend to personal hygiene and, while there are aids available to protect bandages from getting wet when showering, bandages still make relatively simple procedures challenging.

Patients will probably be unable to wear their normal footwear while in active treatment with bandages; alternatives may leave them vulnerable to falls, with an inadequate range of ankle flexibility, and being socially isolated if open-toed sandals or house slippers mean they cannot go outdoors in inclement weather (King et al, 2007). In a systematic review of issues for patients living with venous and mixed aetiology ulcers, Herber et al (2007) found limitations on activities of daily living, concerns over body image and psychological effects, all of which lead to anxiety and depression that is further compounded by increasing isolation.

A major issue – and one patients often say is the worst part of having an ulcer – is the underestimation of the pain they experience (Hofman et al, 1997). The World
Health Organization's three-step ladder for managing pain provides a range of options from non-opioids to opioids (tinyurl.com/WHO-pain-ladder). It is important that nurses really engage with their patients to understand the nature and triggers of the pain they experience. Too often things such as leg elevation, good skin management and choices in compression therapies are overlooked despite being able to alleviate pain and discomfort.

Franks et al (2006) measured health-related quality of life in 95 patients with leg ulceration at 24 and 48 weeks. At 24 weeks all showed a significant improvement in pain regardless of whether the ulcer had healed. However, at 48 weeks patients with both healed and unhealed ulcers had worse pain scores and lower energy levels. Patients with unhealed ulcers also exhibited reduced mobility at 48 weeks. The deterioration was thought to be as a result of general ageing but it was interesting to see this effect regardless of healing.

The consequences of venous disease symptoms such as skin changes and itching, oedema and ulceration are clearly a heavy burden for patients, and concordance with treatment can be a major undertaking. This becomes more problematic in people who also have dementia or other forms of cognitive impairment. Managing symptoms such as pain and itching can be extremely difficult when the person affected cannot articulate discomfort or understand the reasons for treatment.

Older people with complex conditions, especially those frail enough to need residential care, are already in a high-risk category and ulceration increases this risk further. Such patients have higher mortality rates than those without ulcers (Takahashi et al., 2008).

Ultimately, the relationship between the patient and nurse is crucial (Ebbeskog and Ekman, 2001), especially when managing a long-term condition such as leg ulcers and aiming to prevent recurrence.

**Conclusion**

There is a need to improve leg ulcer care, especially among practitioners who are less engaged in developing skills and competencies (Knight, 2008; Anderson, 2003). There is a current focus on improving the quality of services and directly involving patients in the evaluation of outcomes.

Serious health issues such as obesity affect the way leg ulcer-related services are delivered and a greater understanding of the needs of people who are morbibly obese is required. This would help prevent lower limb breakdown, where possible, and ensure it is managed safely when problems do occur. This needs to be combined with wider knowledge of how people who are affected can be supported to engage in healthier lifestyle choices.

A better understanding of the materials used in compression therapies would enable practitioners to choose effective treatments while including patients’ needs in the decision. Developments in surgical techniques for venous disease would enable more patients to benefit from surgical intervention, particularly to help prevent ulcer recurrence.

As some of our patients become older and more frail, both physically and mentally, standard management techniques of compression, exercise and elevation become less applicable; we need to develop more effective strategies and management techniques to manage lower limb problems while minimising distress to people who have reduced and altered understanding of their condition and treatment.

**References**


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