Hard-to-heal venous–lymphatic leg ulcers: a special case

José António Silva, Rosário Filipe, Manuel Esteves Cardoso and Anneke Andriessen

Abstract

In the treatment of this 56-year-old male, the aim was to attend to his multiple pathologies, reducing his venous-lymphatic oedema on both legs, closing the extended ulcers and improving his quality of life. The patient received treatment in a community-based wound healing clinic. After various local therapies were not successful, the wounds were cleansed with saline and covered with a biocellulose dressing (BWD) and polyhexanide (PHMB), after which a short-stretch bandage system was applied. Compression was then switched to a tubular compression system. At day 0, both lower legs had significant oedema and circumferential venous-lymphatic ulcers, and the left leg showed signs of inflammation. However, at day 8, inflammation, oedema and ulcer area had reduced. After 2 months, the ulcers were almost closed and the oedema had reduced to a level where the tubular compression system could be applied. Treatment using BWD and compression and good adherence to this regimen led to ulcer closure. This improved the patients' quality of life significantly.

Key words: Venous-lymphatic leg ulcers ■ Chronic venous insufficiency ■ Lymphoedema ■ Compression bandaging

Chronic venous insufficiency (CVI), a consequence of lower extremity valvular reflux, produces hypertension in the dermal microcirculation. Increased venous pressures causes distension of capillary beds, leading to extravasation of red blood cells, and macromolecules into the dermis (Bergan et al, 2006). The result of this is inflammation, leading to ulceration (Moffatt et al, 2001; Bergan et al, 2006). Venous ulcers may be multiple or single and are typically painful and shallow (Moffatt et al, 2001). Ulcers can vary significantly in size and are difficult to manage, particularly if they are painful, complicated with dermatitis, or if they drain profusely. Compression is the standard treatment for venous ulcers (Moffatt et al, 2001; Rabe et al, 2003; Andriessen et al, 2009).

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The aetiology of venous ulcers may be of a combined nature. This is the case with venous ulcers that are complicated by an arterial component or, as in this special case, with a lymphatic component (Moffatt et al, 2003; Rabe et al, 2003). Lymphoedema is the result of accumulation of fluid and other elements (e.g. protein) in the tissue spaces owing to an imbalance between interstitial fluid production and transport (Moffatt et al, 2003). It arises from congenital malformation of the lymphatic system, or damage to lymphatic vessels and/or lymph nodes. About a quarter of patients suffer from lymphoedema associated with poor venous function (Moffatt et al, 2003; Rabe et al, 2003).

Patient history

The patient is a morbidly obese 56-year-old male, weighing 141 kg and 1.58 m tall, with hypertension, diabetes mellitus type 2, renal failure (dyalisis since 2007), dyslipidemia, sleep apnea, chronic venous insufficiency, elephantiasis, right inguinal hernia and Pickwick Syndrome. Since 1999, he has been admitted to the hospital multiple times for dyspnea, erysipelas and cellulitis. In 2009 he received a gastric balloon, consequently, his weight to decreased to 105kg at the end of the study (01/2010). The aim of treatment for this patient was to attend to his multiple pathologies, reduce the oedema in his legs, close the large circumferential ulcers, improve his mobility, and enhance his quality of life.

Both of the patient's lower legs had circumferential weeping scattered lesions of venous-lymphatic aetiology that had been present for over 2 years. The wound bed was covered with slough and moderate amounts of exudate. Through completing a Doppler assessment, his ankle to brachial index (ABI) was 0.9 for his left leg and 1 for his right leg. He had normal pulse volume recording in both legs, which excluded the presence of significant peripheral arterial disease. There was significant oedema (42.2cm ankle circumference) and signs of inflammation, i.e. redness, pain and warmth. The skin was very dry and there was evidence of skin cracks, rhagades (fine scars), hyperkeratosis, scabs and lipodermatosclerosis.

Previously, the patient had been treated unsuccessfully with foam, alginate and silver dressings and compression therapy with light elastic bandages. The compression bandages were found to be too light to ensure an effective interface pressure (i.e. moderate pressure bandaging, supine position and 45-55mmHg, localisation pressure point at the base of the calf). This level of pressure is in line with current guidelines to ensure adequate compression (Partsch et al, 2006).

Figure 1a. Front left lower leg at the start of the new treatment regimen

Figure 1b. Both legs are swollen with circumferential weeping skin and superficial ulcers

Treatment

The dressing evaluated throughout this case study is biosynthetic cellulose (BWD) dressing Suprasorb X (Lohmann & Rauscher, Germany), which has the ability to both donate and absorb moisture (Alvarez et al, 2004; Andriessen et al, 2009). The dressing is combined with polyhexanide (PHMB) (Suprasorb X + PHMB) to reduce the bacterial load and support wound cleansing. For compression, a short-stretch bandage system (Rosidal sys, Lohmann & Rauscher) was applied and, after the oedema had reduced, compression was continued with a tubular compression system (Rosidal Mobil, Lohmann & Rauscher).

After various local therapies had been attempted, such as alginates, foams and hydrofibers, combined with elastic compression, a new treatment regimen was started in December 2008. The patient's wounds were cleansed with saline and covered with BWD and PHMB. As there was inflammation present, it was assumed that the PHMB-containing dressing would help reduce inflammation. As the dressing is able to absorb and to donate fluid, it can stay in place for up to 1 week. The dry skin was cleansed with lukewarm water and gently dried. A moisturising cream was applied and covered with a non-elastic tubular bandage for skin protection. A short-stretch bandage system with a foam under-padding layer was applied to reduce oedema (Alvarez et al, 2004; Mosti et al, 2008; Andriessen et al, 2009).

Depending on the level of exudate produced, compression bandages are typically applied in weekly intervals by trained clinicians (Alvarez et al, 2004; Mosti et al, 2008; Andriessen et al, 2009). At the start of the treatment, owing to the amount of exudate and the significant oedema, dressing and bandage changes took place every 2 days. After 3 weeks, this was reduced to once weekly.

Sub-bandage pressure measurement was performed with the Picopress device upon application of the compression bandage. The sub-bandage pressure at the base of the calf in standing, as checked after application, was between 40 and 50mmHg (Partsch et al, 2006; Mosti et al, 2008; Mosti et

Figure 2a. After 8 days, inflammation on the left leg has reduced

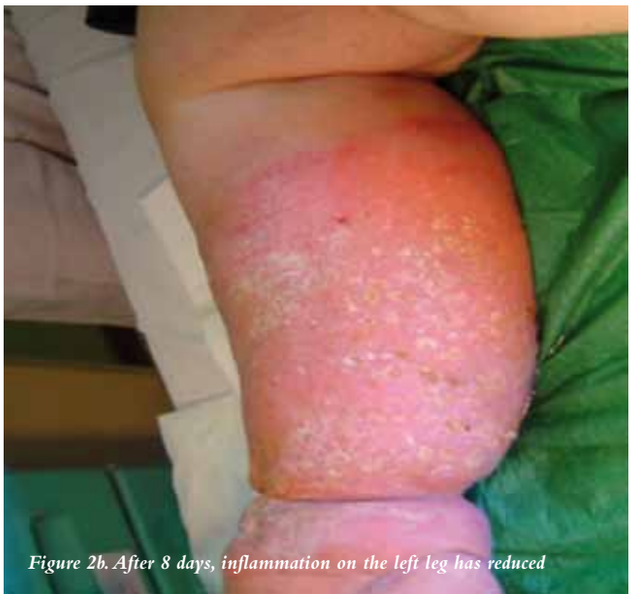

Figure 2b. After 8 days, inflammation on the left leg has reduced

Figure 2c. The dressing in place on the left leg before removal

al, 2010). Clinicians received training on the use of both the dressing and compression therapy, and attended a training course at the Catholic University in Lisbon on venous leg ulcers, lymphoedema and compression therapy.

In February 2009, the oedema had reduced to a minimum as the ankle circumference went down from 42.2cm to 25.8cm. The patient's leg ulcers were found to be markedly smaller; scoring was done using a 5-point scale that rates aspects of improvement. As a result of this, compression therapy was then performed with a tubular compression system. The tubular system consists of two layers: a silk-like layer that is applied on the skin and left in place during the night, and a tubular compression layer that is applied in the morning over the first layer. The tubular system provides about 40mmHg of pressure at the ankle.

Results

After 8 days, inflammation of the patient's left leg had reduced and his reported pain decreased from 9 on a 10-point visual analogue scale to 3 (*Figure 2a; b*). Following 14 days of treatment, exudate production has reduced to slight production and the ulcers had reduced further (*Figure 3a; b*). Then, after 2 months of BWD and PHMB application, the ulcers were almost closed and the oedema had reduced to a level where a tubular compression system could be applied.

The advantage of using the tubular compression system was that it could be removed for showering and could also be easily reapplied. The patient was able to walk regularly, which was of benefit for his overall condition, making him less dependant on care. Additionally, his increased mobility enabled him to activate his foot pump and calf muscle pump, improving the circulation in his lower limbs. This led

Figure 3a. After 14 days, exudate production has gone down as well as the oedema. The ulcers are progressing to healing

Figure 3b. A short-stretch compression system with foam under-padding was used on both legs. The non-elastic tubular bandage was kept long enough to cover the top layer of the compression, securing it

him to have much more energy and he became motivated to lose weight and exercise, which was previously very difficult for him.

Although the patient was initially sceptical about possible treatment outcomes, he eventually became motivated to change his situation. As previous treatments had failed to improve his situation, he was led to believe that healing of his ulcers and reduction of his oedema was not an option. The patient reported that feeling no pain and seeing marked results boosted his confidence. Moreover, for the first in time in a long while, it gave him a sense of control over his situation, motivating him to improve his quality of life even further. He has now accepted that maintenance therapy with a compression system is needed to prevent recurrence, and has agreed to visit the community wound-care clinic for regular check-ups every 2 months.

Conclusion

Effective treatment using BWD and compression, combined with good adherence to the treatment regimen led to oedema reduction and ulcer closure. This improved the patients' quality of life significantly, enhancing his mobility, self-confidence and independence. It also enabled him to better control his weight and to adhere to the prevention measures, wearing his compression system and doing daily exercises. Moreover, and importantly, he was able to make new friends, improving his social life. BJN

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Figure 4a. After 26 days

Figure 4b. After 54 days, the compression was continued with a tubular compression system