Treating venous ulceration

Seventy year old Mrs Thomas suffered from chronic circumferential bilateral leg ulcers for eight years. They were sloughy and exuding copiously. In the early stages of the venous ulcers, Mrs Thomas had participated in research at the Wound Healing Research Unit in Wales. She was referred onwards to attend the wound healing specialist community nurse led clinic which was set up in 2001, and where she was regularly treated by the specialist nurses. The district nurses provided home support so that her recommended treatment could be continued.

Unfortunately Mrs Thomas’s medical condition deteriorated in 2005 and she was unable to attend the community clinic. This article describes the care given to her after this time and the outcomes.

Assessment

Over the years of her treatment, Mrs Thomas had been provided with many compression bandage systems to try to heal her ulcer. When her legs became infected, 3 layer Tubigrip was used as alternative. Throughout 2006, antibiotics were frequently requested due to cellulitis and bilateral clinical infections.

Mrs Thomas was a known epileptic and had seizures and she lived alone with no family support. Her quality of life was poor due to her ulceration and frequent clinical infections. In April 2007 the district nurse team contacted the community wound team with a view to re-assessing this lady.

Mrs Thomas had ongoing treatment for her legs and could be monitored by specialist nurses providing her with regular contact and support. A full assessment was completed using HEIDI (implemented by Professor K Harding at the Wound Healing Research Unit), a tool used in wound assessment (Table 1).

Routine bloods were taken to check inflammatory markers (CRP white cell count) and a Doppler test was performed. Her right leg Ankle Brachial Pressure Index (ABPI) was 1.10 and her left ABPI was 0.98. Her arterial sounds were clear and bi-phasic. These results suggested minimal arterial involvement and meant she was suitable for compression therapy.

Assessment of the patient as a whole (holistic care) is vital if treatment is to be successful. The wound should never be looked at in isolation as so many physical and psychological problems can affect the healing potential. Therefore, a full medical history was obtained to determine which factors played an important role in Mrs Thomas’s case and this assess-

| Table 1: HEIDI  
(Implemented by Professor K Harding at the Wound Healing Research Unit) |
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ment identified that her wound healing was impaired by:

- Poor ankle movement
- Limited mobility
- Oedema
- Recurrent infections with *Pseudomonas* and *Staphylococcus*
- Eczema

Assessment of Mrs Thomas’s skin surrounding her wound showed areas of hyperpigmentation and lypodermatosclerosis and was macerated with erythema. Oedema was present and so was gravitational eczema.

The wound bed was sloughy (Figure 1) with evidence of colonisation and the wound edge was static. Exudate loss was heavy and malodorous and she had continuous pain which was unrelieved with analgesia. The ABPI results indicated this was a venous leg ulcer, and the condition of the legs were consistent with early signs of lymphoedema.

Written consent was obtained from Mrs Thomas prior to the ulcer being photographed and measured and then measurements were taken of both legs. The right leg measured 12cm by 9cm (total surface area of 108cm²) with a depth of 0.4cm. The calf measured 52cm and ankle 35cm. Her left leg measured 16cm by 7cm with a depth of 0.3cm calf measurements 52cm, ankle 34cm. This gave a baseline so that correction of oedema could be monitored.

Making an accurate diagnosis requires good assessment skills together with an understanding of how to interpret the results and findings of the examinations and investigations. The diagnosis and the holistic assessment of Mrs Thomas led to a decision to use compression therapy as the treatment of choice.

**Compression therapy**

One of the most fascinating features of the human body is its ability to repair damaged tissue (Russell, 2000). When healthy skin is injured a complex process occurs and the healing process is orchestrated. However, when the body is not functioning correctly, the orchestration is out of tune and healing halts or slows.

In venous ulceration, it is the valves within the veins that are not functioning correctly. Normally, the superficial (great and small saphenous veins) and deep veins (which lie beneath the deep fascia of the leg) are linked together by the perforator veins with the deep veins under high pressure and the superficial veins under lower pressure (Hampton & Collins, 2003). Blood is returned to the heart through intrathoracic pressure (breathing) compression of the calf muscle and through a system of non-return valves within the veins. The sounds of intrathoracic pressure can be heard by placing a Doppler probe over a vein within the arm. As inspiration and expiration occur, the blood can be heard rushing through the vein and then pausing in time to the breathing pattern (Hampton & Collins, 2003).

If the valves cease functioning effectively, then the blood cannot successfully be returned to the heart and it begins to pool in the feet and ankles, cause hydrostatic pressure within the veins, leading to oedema. The simple treatment of this is to use compression therapy to do the job of the valves. If graduated pressure is correctly applied, the blood cannot pool in the legs, the oedema resolves and the wound has the potential to heal.

**Treatment**

Treatment considerations must include the cost of treatment and nursing time and this must be balanced with the most effective treatment for the patient. It was decided to try a new approach and use a short-stretch compression bandaging system. Short-stretch bandages have been successfully used for treatment of venous leg ulcers for some years now (Hampton & Collins, 2003). A randomised trial conducted in Oxford compared the short stretch bandages with four-layer bandages and long stretch bandages. This study demonstrated that the reduction in oedema and healing rates were significantly higher in the four-layer and short stretch group than in the long stretch group and that there was no significant difference in the efficacy between the short-stretch bandage and the four-layer system (Duby et al., 1993). Therefore, a short-stretch system, being equal in healing potential and less costly, seemed the sensible system of choice for Mrs Thomas’ treatment.

Mrs Thomas had completed a two week course of antibiotics prior to assessment at home therefore, any infection was likely to have been resolved. However, it was important to reduce the potential for infection and so treatment consisted of daily soaks of Potassium Permanganate with Elecon ointment to reduce the infection potential and eczema. Flamazine and Aquadel were applied to both bilateral leg ulcers and the one layer Actico short-stretch compression bandage system was commenced.

The main nursing priorities were to reduce Mrs Thomas’s pain and reduce exudate without an increase in dressing bulk as well as protecting the surrounding skin from further breakdown and to return to once daily dressing changes.

**Week 3 - 2nd visit**

Initially the dressings were changed daily for two weeks then reduced to alternate days. On the third week, a re-assessment was undertaken using HEIDI. This identified that generally there was an improvement to both leg ulcers surrounding skin (Figure 2) and no evidence of clinical infection, however, there was odour. Mrs Thomas had tolerated the short-stretch bandage system very well.

The legs were re-measured to assess the reduction of oedema. The right calf measurement was 48cm (reduction of 3cm), the right ankle measurement 35cm (reduction of 2cm), the left calf measurement 48cm (reduction of 4cm) and the left ankle measurement was 32cm (reduction of 2cm). When an ankle circumference is above 25cm research suggests that two layers should be applied. However, Mrs Thomas was not keen to try this so no changes were made to the compression treatment plan.

As the results were positive, it was decided to continue using the Elecon ointment that was being applied on alternate days and continue with Flamazine, Aquadel and one layer Actico short-stretch compression.

**Week 7 – 3rd visit**

The bandage system and dressing changes had now been reduced to three times weekly and there was an overall improvement to the ulcers (Figure 3). The right leg wound measured 8cm by 4.2cm with a depth of 0.3cm and the left leg had three superficial areas which measured approximately 1cm by 0.5cm.

The wound bed showed signs of granulation with minimal sloughy tissue, the wound edge was epithelialising, and the surrounding skin was fragile. Eumovate ointment was recommended to treat the dry eczema weekly following regular Epaderm soaks with Aquadel to the right ulcer and NA Ultra to the left and Actico short-stretch bandage system to continue.

**Week 13 - 4th Visit**

The wound bed on the right leg was now granulating with minimal sloughy tissue
with the wound edge epithelialising although the surrounding skin was still fragile.

Wound measurements on the right leg were now 5cm by 3.5cm (total surface area of 17.5cm² and a total loss of surface area of 90.5cm²) with a depth of 0.3cm. The left leg had healed on this visit. Made to measure hosiery was recommended and measurements taken for the prescription and the short stretch bandage system was re-applied until the hosiery arrived.

Week 19
The right leg ulcer had reduced in size to 4cm by 2cm (total surface area of 8cm²) and a total reduction in wound size of 10cm² with a depth of 0.2cm. Epaderm soaks, Aquacel, with yellow line Tubifast, Flexi-ban wool and one layer Actico short-stretch compression was continued.

The right calf now measured 45.5cm which was a reduction of 6.5cm. The right ankle measured 25.5cm which was a reduction of 10.5cm. The left calf measured 41.5cm which was a reduction of 10.5cm and the left ankle was 24cm, a total reduction of 10cm.

Unfortunately since the last visit Mrs Thomas had knocked her left leg and, although the areas were superficial, a short stretch bandage was re-applied.

Outcomes
Within the first few days of application of short-stretch bandages Mrs Thomas reported to the nurses that the bandages were comfortable and she was able to wear footwear with no discomfort on removal. This is due to the reduction of oedema, which in itself can cause pain and discomfort.

Mrs Thomas leg pain has been significantly reduced, even during dressing changes and therefore, her quality of life has greatly improved. The maceration of the surrounding skin had resolved and epithelialisation had taken place. Overall leg circumference had reduced and became softer when reassessing oedema in calf area.

As the wound was controlled and the reduction in the level of exudate was evident dressing visits were discontinued after two weeks. Restricted mobility remained a problem although she was able to rest in bed more as she was less concerned about soiling the bed due to the levels of exudate in the early stages of treatment.

Conclusion
Before the reassessment began in April 2007, the nurses were finding treatment of Mrs Thomas very difficult. The treatment plan initiated in the home was commenced with reservations as healing was considered difficult due to patients perpetuating factors. However the use of a short stretch compression bandage system overcame significant obstacles in stabilizing the ulcer and improving the condition of the surrounding skin. It also prompted concordance by reducing overall pain. Together the dressing and the bandage protected the surrounding skin from the damaging effects of wound exudate.

The patient’s quality of life was also enhanced by having dry slippers due to manageable exudate levels, and no odour, swelling or re-infection, eczema to her legs.

References