Cohesive short stretch bandages in the treatment of venous leg ulceration

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There are a number of different compression bandages and other options for treating venous leg ulceration. These include short-stretch, long-stretch, and multilayer bandages; compression hosiery, intermittent pneumatic compression and the Unna boot (Cordts et al, 1992; Bowszyc et al, 1993; Duby et al, 1993; Layton et al, 1994; Scriven et al, 1998; Partsch et al, 2001). These methods, in combination with exercise and resting periods, are important components to reverse venous hypertension, increase deep venous return, reduce pain and enhance the wound healing process. The following two case studies describe how a cohesive short-stretch bandage and an appropriate primary application were used in the treatment of patients with a venous leg ulcer complicated by a ‘champagne bottle’-shaped legs.

In a normal-shaped leg, the circumference of the leg gradually increases from the ankle up toward the knee. An appropriate bandage applied to a normal-shaped leg with a spiral technique and with the same tension will produce graduated compression (Stemmer et al, 1980). The frequency of reapplication of the bandage will depend on several factors. These include:

- Changes in the leg’s diameter as a result of oedema reduction
- The condition of the wound bed
- Levels of exudate
- Skin condition
- The patient’s level of physical activity.

The type of primary application, e.g. alginate, hydrocolloid, if one is used, may also necessitate a more frequent inspection and application change. It is possible to leave a bandage on a leg for up to 7 days when all these factors are appropriately addressed and suitable conditions are met.

In a ‘champagne bottle’ shaped leg, i.e. one with a small ankle circumference in comparison with an extra large calf muscle, it is often not possible for a bandage to be applied in a simple spiral manner and still remain securely in place on the leg. If the bandage slips down the leg it can be uncomfortable for the patient and can cause damage to the skin, wound and/or bony prominences of the leg, such as the malleolus. A bandage which does not stay in place will also not provide adequate compression for reversal of venous hypertension and wound repair. This is discouraging for the patient and the health professionals involved.

In a number of cases at the clinic run by the author, a cohesive short-stretch compression bandage has been shown to be effective in addressing the problem of bandage slippage, in particular for champagne bottle-shaped legs. The bandage has a latex coating on both sides that give it ‘non-slip’ properties. The following case studies report how we overcame problems associated with bandage slippage using the cohesive bandage on two patients with venous leg ulcers and champagne bottle-shaped legs.

Case Study 1
Mrs P was a 56-year-old lady, who was overweight. She had had a venous ulcer on her right leg for the past 4 years, but had no other medical problems. Her local practice nurse referred Mrs P to our leg ulcer clinic. Before her referral, she had been treated by the practice nurses, district nurses and in a hospital leg ulcer clinic. During this time a variety of primary wound dressings and compression methods had been used, however, obesity and Mrs P’s champagne bottle-shaped leg complicated the management/treatment of the wound. Mrs P thought her ulcer would never heal and had became quite depressed about her situation.

At her first visit to the leg ulcer clinic, a full holistic assessment was conducted. Doppler measurements showed her resting ankle brachial pressure index (ABPI) to be 1.0 in the right leg and 1.1 in the...
This indicated that she had healthy arterial function and was suitable for compression. The ulcer, measuring 10 cm x 10 cm, was on the lateral aspect of her right lower gaiter area (Figure 1). The ulcer showed 90% sloughy tissue and 10% healthy granulating tissue. The surrounding skin had evidence of maceration and skin excoriation due to the high amount of exudate from the ulcer. This caused Mrs P a lot of pain. Her right ankle circumference was 27 cm and calf circumference was 55 cm. From our experience if a bandage is applied in a spiral technique to this type of leg, it will generally not stay in place.

Initially Mrs P was seen three times a week with the aim of reducing swelling, exudate and pain. A 15cmx15cm hydrofibre pad was applied as the primary dressing. The ankle and lower gaiter area were protected with sub-compression wadding bandage. It is the leg ulcer clinic’s guideline to use two short-stretch bandages when the ankle circumference exceeds 25 cm, because the pressure is increased by a greater number of bandage layers (Logan et al, 1992). Therefore, two short-stretch compression bandages were applied using a combination of the spiral and St. Charles bandaging techniques – referred to as the ‘mixed’ technique (Figure 3). As the exudates and swelling decreased, the leg circumference also decreased, causing the bandages to slip and the amount of compression to be reduced. Friction between the slipping bandage and newly developed skin around the ankle caused additional pain for Mrs P. Loss of compression prevented reversal of venous hypertension, wound repair and reduction or elimination of pain.

In order to address this situation we decided to use a cohesive short-stretch bandage. Sub-compression wadding bandage was used to protect bony prominences and a 12 cm-wide short-stretch bandage was applied over that using the mixed technique. Then a 12 cm-wide cohesive short-stretch bandage was applied using the mixed technique but in the opposite direction to the other bandage. By applying the second bandage in the opposite direction to the first bandage, the integrity of the total application is more assured.

The patient’s next visit was 4 days later and the bandages had not slipped down her calf or rucked around the ankle. The primary dressing and undercast padding had also stayed in place. Evidence of new epithelialization around the wound margin was noted, indicating that the healing process had started. Wound measurements were taken on a monthly basis and the ulcer size decreased gradually. Mrs P’s ankle and calf circumferences and reported pain decreased as well. This gave Mrs P a more positive outlook. The ulcer was then dressed twice weekly until complete healing took place. During the healing process Mrs P seemed less depressed. She enrolled in an exercise class to address her weight problem and also had regular appointments with a dietitian to get advice and support. The total healing process took 16 months. After the ulcer had healed Mrs P was supplied with made-to-measure class 4 compression hosiery which she continues to wear. She is now seen regularly on a follow-up basis. Her leg ulcer has not re-occurred and Mrs P remains free from venous leg ulcer associated pain (Figure 2).

By maintaining adequate compression without bandage slippage, venous hypertension was reversed and the process of wound repair could proceed. The cohesive short-stretch bandage was the contributing factor in maintaining adequate compression and bandage stability.

**Case study 2**

Mr W had a history of a recurring venous leg ulcers and had been treated by his GP’s practice nurse. His present ulcer started 4 months before he came...
to the leg ulcer clinic, to which he was referred by his GP. He was obese and had a history of ischaemic heart disease. He had had a coronary artery bypass graft in 1997, and suffered from hypertension. On his first visit to the clinic his resting ABPI measurements were recorded as 1.1 in both right and left legs. The ulcer was on his left leg in the lateral gaiter area and measured 2cm x 3cm. It was entirely covered in thick yellow slough. His ankle circumference was 27cm and the calf measured 46cm. Mr W's legs were therefore considered to be champagne bottle-shaped.

Following the holistic assessment it was decided that a hydrocolloid dressing would be the initial primary dressing, to assist autolytic debridement of the thick yellow slough. Following the clinic guideline, two short-stretch compression bandages were applied. Within one week after application of the primary dressing, padding to bony prominent parts and two short-stretch bandages, bandage slippage around the calf had occurred. Since Mr W's leg was champagne bottle shaped, it was decided to bandage his leg as in case study 1; a hydrocolloid dressing was applied as the primary application; sub-compression wadding bandage was applied to protect bony prominences; a short-stretch bandage was applied; and finally a 12cm-wide cohesive short-stretch bandage was applied in the opposite direction. Both bandages were applied using the 'mixed' technique as in case study 1.

Mr W's ulcer was dressed twice-weekly for 3 weeks and then weekly over the next 8 weeks. No further evidence of bandage slippage was noted using this bandage combination. His left ankle and calf measurements reduced to 24.5 cm and 42 cm respectively, and his ulcer healed within 8 weeks. Mr W was prescribed class 4 below the knee compression hosiery. The use of 'normal' and cohesive short stretch bandages were seen as a major contributing factors in the management and healing of Mr W's venous leg ulcer.

**Conclusion**

It is quite evident from these two case studies that it is important for compression bandages to remain in place. From our clinical experience a bandage applied spirally will generally provide adequate compression and stay in place for normal-shaped legs. However, bandages often slip on champagne bottle-shaped legs. One consequence of bandage slippage can be friction to the skin either around the ankle, achilles tendon, tibia and/or calf, resulting in pain, wound damage and/or skin damage. Bandage slippage also reduces compression, diminishing the

**Figure 3. the mixed bandaging technique, a combination of spiral and St Charles methods**
reversal of venous hypertension and venous ulcer-associated pain. These two case studies have shown how the use of a cohesive short-stretch bandage and the mixed bandaging technique can effectively address these problems in patients with a large calf:ankle ratio.


KEY POINTS

• Compression bandaging is a major component of any plan to reverse venous hypertension, increase deep venous return, reduce pain and enhance the wound healing process in patients with venous leg ulceration.

• Legs with small ankles and extremely large calves (champagne bottle-shaped) are difficult to bandage effectively.

• Bandage slippage is a common problem with champagne bottle-shaped legs.

• Slippage leads to a reduction of compression, as well as friction and possible tissue damage.

• A cohesive short-stretch bandage applied using the mixed bandaging technique was effective in preventing bandage slippage and so maintaining dressing integrity and compression levels.