HOW TO USE WOOL PADDING WITH COMPRESSION BANDAGING

Marie Wilson is Tissue Viability Clinical Nurse Specialist, Epsom and St Helier University Hospitals NHS Trust

Compression bandaging is the standard treatment for venous ulceration and is based on providing graduated compression from ankle to calf. Many people do not have a standard leg shape which can disrupt the action of compression bandages and even cause pressure damage. Wool padding can be employed to ensure that sub-bandage pressure can be maintained to ensure effective treatment.

Venous leg ulceration accounts for a large percentage of chronic wounds with an estimated 7,000–19,000 people within the UK being affected (Posnett and Franks, 2006). The cost to the NHS of treating these wounds is estimated at between £300 and £600m per year (Moffatt, 1995). The personal cost to each individual with ulceration, however, is unmeasurable. It is, therefore, important that practitioners responsible for the care of such individuals have the appropriate training, knowledge and skills to undertake their treatment competently and effectively.

Compression bandaging

A recognised and successful treatment of venous ulceration is the use of graduated compression bandaging (Blair et al, 1988; Callum et al, 1992). This may be either a high compression bandaging system that incorporates elastic layers to achieve a sustained level of compression over a period of time (Moffatt, 2005) or a non-elastic, short-stretch bandaging system. The application of compression bandaging is, however, a complex

Figure 1. Before the application of wool padding, the ankle circumference must be measured.

skill and poor or inappropriate application will be detrimental to the individual patient (Nelson et al, 1996; Eagle, 1999).

Any increase in the tension of the bandage, an increase in the number of layers, and/or decrease in the width of the bandage will increase sub-bandage pressures

It is, therefore, important that before bandage application the practitioner has an understanding of the theory behind compression therapy, particularly Laplace's Law and sub-bandage pressures (Moffat, 2005). Sub-bandage

pressure results from a relationship between the bandage type (width), tension of application, the radius of the ankle and calf girth, the number of layers and the surface hardness (Melhuish et al, 2000). This is known as the Laplace's Law equation.

$$\text{Pressure} = \frac{\text{Bandage tension x number of layers applied}}{\text{Circumference of limb x width of bandage}}$$

Therefore a bandage applied with a 50% overlap between turns with a constant tension will ensure a higher bandage pressure at the ankle than at the calf, as the limb circumference

gradually increases, enabling graduation of compression. A bandage applied to a limb of normal proportions using this method should automatically produce graduated pressure.

Most individuals, however, do not have a regular leg shape and can present with disproportionate legs which can mean that pressures vary significantly at any given point on the limb (Thomas, 1998). As a result it is important to measure the individual limb before bandaging to ensure that the patient's ankle circumference is 50% of the calf circumference (Hampton and Khan, 2002).

Any increase in the stretch/tension of the bandage, an increase in the number of layers, and/or decrease in the width of the bandage will increase sub-bandage pressures (Moffat, 2005). This may inadvertently lead to pressure damage below the bandaging.

Pressure damage

Pressure damage under compression bandaging is caused by a variety of factors many of which may not be present during the initial assessment (Edwards, 2003). This means it is important to regularly reassess the patient to monitor changes not only in the affected limb/s but in any comorbidities.

For example, a patient presenting with venous incompetence may develop a problem such as an occlusion (blockage) or a stenosis (narrowing) of an artery while receiving compression therapy, hence the need for regular vascular re-assessment during

Figure 2. Measuring the calf circumference, to determine there is at least a 10cm difference between this and the circumference of the ankle.

Figure 3. The wool padding is applied in a double turn at the base of the toes.

Figure 4. Application then continues over the foot and the medial malleolus (ankle), close to the heel.

treatment with compression bandaging (Royal College of Nursing, 2006). Without regular Doppler ultrasound, damage could be caused by inappropriate continuation of high compression bandaging. There is also a need to recognise changes in the shape of the limb/foot to ensure sufficient padding is applied.

Using wool padding to avoid pressure damage

The patient's limb shape alone can be a factor in the development of pressure damage. In the older person the limb may present with muscle wastage of the calf and therefore be very thin. Because these types of limbs lack a natural gradient they require padding out with orthopaedic wool bandages to give the leg bulk and gradient (Edwards, 2003). Other patients may have a steep gradient between a narrow ankle and prominent calf muscle resembling an inverted champagne bottle), and these limbs require extra application of wool bandage at the gaiter region. All bony areas such as the tibial crest, malleoli, and bunions will also be prone to high levels of pressure and wool padding must be applied. Thus the practitioner must be competent and experienced in the art of compression bandaging and able to recognise all of the above and ensure good bandaging technique.

How to apply wool padding

Before applying the wool padding, the ankle and calf circumference must be measured (*Figures 1 and 2*) to determine there is at least a 10cm difference between the two measurements to ensure that the bandages apply the correct amount of compression.

If the limb needs padding, the wool should be applied in a double turn at the base of the toes (to secure the wool and prevent slippage) (*Figure 3*), continuing over the foot and then over the medial malleolus (ankle) close to the heel (*Figure 4*), ensuring that the wool is not overstretched to prevent ripping.

Figure 5. The wool is applied over the lateral malleolus (ankle) close to the heel.

Figure 6. The ankle is completely enclosed.

Figure 7. The wool padding is applied to the leg ensuring there is a 50% overlap of bandage.

Figure 8. The ankle's circumference is again measured once the padding is in place.

Figure 9. The padded calf's circumference is also measured and compared with the padded ankle's measurement.

Figure 10. More wool padding is applied to the calf area to increase the calf circumference which will also protect the tibial crest from pressure damage.

The wool then needs to be applied over the lateral malleolus (ankle) close to the heel (*Figure 5*) and then the heel must be completely enclosed (*Figure 6*). The padding must then be extended up the leg ensuring there is a 50% overlap of bandage (*Figure 7*). Once it has been applied, it is important to again check the ankle and calf circumference to ensure that the difference is still 10cm (*Figures 8 and 9*). If necessary, apply more wool padding to the calf area to increase the calf circumference as this will also protect the tibial crest from pressure damage (*Figure 10*).

Other benefits of using wool padding

The value of wool padding must be considered when undertaking compression bandaging and it should be remembered that it not only redistributes pressure but can also absorb exudate, prevent chaffing, and act as a barrier to any potential allergy that may occur due to the elastic/rubber properties of the bandages.

Professional accountability

Every patient with a venous leg ulcer must be assessed and treated as an individual case on initial and subsequent assessments. The practitioner undertaking assessment and any compression bandaging must be competent, knowledgeable, and recognise their responsibilities and accountability to the patient and to their professional regulatory body (Anderson, 2003).

Conclusion

Patients deserve professional care throughout their leg ulcer experience. It thus follows that every practitioner caring for these

patients must be competent and knowledgeable in relation to bandages and bandaging technique. The practitioner must also recognise the value of wool bandaging/padding and use it accordingly. **WE**

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