

TEN TOP TIPS FOR TOE BANDAGING FOR CHRONIC OEDEMA/LYMPHOEDEMA

Toe bandaging is often seen as complicated and potentially dangerous, but with the right training and guidance this article sets out to underline the potential benefits, including controlling swelling in the toes and reducing the risk of infection.

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Chronic oedema is estimated to affect 3.99 people per 1,000 of the UK population, rising to 10.31 per 1,000 people aged 65–74 and again to 28.57 per 1,000 people aged 85 or above (Moffatt et al, 2012). There are many causes of chronic oedema, but they largely fall into four main categories: lymphoedema (both primary and secondary), lipoedema, dependency oedema, and lymphovenous or phlebolymphoedema (Green and Mason, 2006).

Toe bandaging is an accepted part of multi layer lymphoedema bandaging (MLLB) (International Lymphoedema Framework [ILF], 2006) and its use in venous hypertension has been reported by McCann (2008). Toe swelling can be a natural occurrence in chronic oedema, but can also be induced by incorrectly applied compression bandaging that leaves the toes and often the forefoot free of compression.

Both Todd et al (2003) and McCann (2008) questioned whether toe bandaging may actually prevent toe ulceration in patients requiring lower-limb compression bandaging for venous leg ulceration. This followed an article by Chan et al (2001) who analysed 194 patients attending a leg ulcer clinic and found that after receiving bandage treatment, 12 patients had developed toe ulceration.

Toe swelling, if not managed, can lead to bacterial and fungal infections, which, in turn, can develop into cellulitis or skin breakdown. Toe bandaging will reduce the risk of infection.

Compression bandaging is known to reduce capillary filtration by increasing the pressure in the subcutaneous tissues and preventing fluid from entering the interstitial spaces (European Wound Management Association, 2006). This process, however, must be ongoing so if it is initially achieved with bandaging it will need to be continued with compression hosiery. Compression combined with exercise increases lymph flow and venous return, thus reducing the volume of oedema. In addition, it increases the blood flow into the microcirculation, which may improve wound healing and help soften thickened or ‘woody’ tissues.

LaPlace’s law is an accepted mathematical equation that states compression applied to a limb can be increased by:

- ▶▶ The tension applied to the bandage
- ▶▶ The size of the limb
- ▶▶ The number of layers applied
- ▶▶ The width of the bandage.

As the toes are the smallest circumference of the limb, it is essential they are considered when applying

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compression bandaging to the lower limb if oedema is present.

Before commencing toe bandaging, as with all types of compression, vascular assessment should be carried out to exclude occult arterial disease (Clinical Resource Efficiency Support Team, 1998). This may include: Doppler/ankle brachial pressure index assessment, pulse oximetry or toe pressures/toe brachial pressure index. Clinical signs and symptoms should also be recorded, e.g. colour/temperature change and comorbidities, referral on to a tissue viability nurse specialist/leg ulcer nurse specialist or vascular surgeon may be necessary before commencing any form of compression.

Particular attention should also be given to those patients with peripheral neuropathy – e.g. with diabetes – who may not be able to detect if the toe bandages are causing friction or trauma. In these instances, toe bandaging should only be used if the patient can be closely monitored. Older individuals with impaired mobility should also be carefully considered for suitability to toe bandaging because if the toe bandaging is causing pain or discomfort, they may not be able to remove the bandages independently.

Standard technique for toe bandaging

1. With a 4 cm elastic conforming bandage (i.e. Mollelast, Activa) start with one turn around the foot at the base of the toes
2. Start to bandage the great toe starting at the base of the nail. Go around the toe, moving downwards with each turn of the bandage until the toe is fully covered with no gaps for oedema to accumulate (the number of turns will depend on the size of the toe). Leaving the toenails and tip of the toes free ensures the toes can be observed for any colour change
3. The bandage must be kept flat at all times. Anchor again around the foot with no tension
4. Start to bandage the second toe,



Figure 1. Standard toe bandaging in situ.

again starting at the base of the nail, repeat all steps until all of the toes except the fifth and smallest toe is reached. This digit is generally not bandaged as it is usually unaffected by oedema

5. The ball of the foot should be completely free of bandage cover.

This article provides ten top tips to help provide effective toe bandaging for individuals with chronic oedema or lymphoedema.

1 BANDAGE WIDTH – TO FOLD OR NOT TO FOLD?

As previously stated, bandage width affects the compression; a 4 cm elastic



Figure 2. Demonstration of folding the bandage when applying toe bandaging.

conforming bandage applied flat will provide less compression than a 6 cm retention bandage, which is folded in half when applied to the toes only. When anchoring the bandage around the foot, the bandage must be flattened out to its full width to reduce the number of layers around the base of the toes, which could affect the direction of lymphatic and vascular drainage. If the toes are significantly swollen, or have skin changes, it may be desirable to use a folded bandage to increase the compression, however, this technique requires practice. The clinician also needs to be aware that if the bandage is folded, this will increase the layers applied to the digit.

2 BANDAGES APPLICATION DIRECTION

It is particularly important to remember the positioning of the feet and toes, and how important the feet and toes are for balance. If applied inappropriately, toes can easily be malaligned by compression bandaging and this can affect a person's gait and possibly induce pain. Compression should not impede function or overall mobility (ILF, 2012). Almost all of the information on toe bandaging states that bandaging should start at the great toe, however, it will depend on whether the person applying the bandage is right or left handed and



Figure 3. Demonstration of padding with undercast wadding when to the underside of the toes.



Figure 4. Polymem toe dressing in situ under toe bandaging.

which foot the bandage is being applied to (e.g. a right-handed application to a right foot will find it easier to start at the great toe, but on the left foot it is more natural to start at the fourth toe).

3 PROTECTION

Not everyone has flat, straight toes and this can be problematic with toe bandaging. King (2007) stated that creases or fissures should be filled with foam, but this can be bulky and fiddly, it is much easier to use folded undercast wadding, e.g. Cellona (Activa) or Coban™ (3M) foam cut to shape. These pieces can be reused daily (as long as they are not soiled) and are just secured underneath the toe with the toe bandage as it is applied.

4 TENSION

Bandages are neater when applied

with tension, but in toe bandaging it is essential that no tension is applied to the base of the toes when anchoring the bandage and, indeed, there should be minimal tension applied to the toes themselves. As previously stated, the tension applied using LaPlace's law increases compression, due to the small circumference of the toes (even when swollen) this must be considered. It is extremely important that the applied toe bandage does not lift the toes up unnaturally. Patients should have full toe flexion and movement; patients should be encouraged to wriggle their toes when the toe bandage has been applied, and they will quickly inform the clinician if it feels restricted or not. The toe bandage should be removed and reapplied if it is too tight.

5 PAPILOMATOSIS/SKIN CHANGES

The toes are common places for papillomatosis to appear. These are benign skin growths of epithelial tissue that may contain fibrous vascular outgrowths. These areas tend to be hyperkeratotic and have a fur-like appearance. Due to their surface vascular supply, the villi may bleed easily if disturbed. They can make toe bandaging more challenging as they often lead to shape deformity. In these instances, a protective layer may be used under the toe bandage (e.g. Cellona or for further protection PolyMem® [Aspen Medical]) toe dressings, which come in various sizes and also have a silver version. In palliative cases, these dressings can be used on their own (the toe end can be cut to make a toe sleeve, rather than full cover). Any other skin conditions, e.g. tinea pedis/fungal nail infection, should be treated immediately to prevent the risk of cellulitis. Fungal nail infections can be transferred to the skin, but are difficult to distinguish from psoriasis of the nail and, therefore, nail clippings should be sent for testing before treatment is commenced. Topical treatments are less effective than systemic therapy, but there are significant side effects that must be considered on an individual basis.

6 LYMPHORRHOEA

In patients with lymphorrhoea (leakage) from the toes, it may be necessary to use a super absorbent dressing. Some of these can be pleated or fanned to fit in between the toes, similar to weaving, in order for the toe bandages to then be applied over this (Hardy, 2010).

7 INCREASING THE COMPRESSION

In extremely swollen or thickened toes where the compression needs to be increased further than just folding the retention bandage in half, reduced stretch fabrics can be used (e.g. Coban 2.5 cm). This small width bandage can either be applied on the roll or cut into strips to make it easier to go between the toes. The tape bandage should be applied from the base of the nail of each toe, working down to cover the whole toe and then cutting off at the bottom of each toe, rub lightly to secure. This can provide increased stiffness and thus higher compression, it can be a useful technique if only one or two toes are affected. This should only be applied by specialist nurse or else under the direction and supervision of a specialist nurse.

8 TOE GLOVES UNDER BANDAGES

Toe gloves can be an effective way of protecting toes from oedema being forced into them during compression therapy or it can be used as an alternative where toe bandaging is problematic. This may occur when the technique has been tried and failed (e.g. patient choice, pain, or lack of confidence/training with the toe bandaging technique). A number of toe caps/gloves on the market are off the shelf in standard sizes and on prescription (e.g. Microfine toe cap, Haddenham, which is a light and silky toe cap that can be cut to fit without fraying, providing great versatility and reducing bulk to the forefoot).

Other toe caps are made to measure and in a flat knit thicker fabric. These are effective, but may take time to obtain.

9 SHAPE DEFORMITY

Limb shape distortion requires adaptation of the application of compression materials (ILF, 2012). When individual toe bandaging is not possible — e.g. due to the extent of the dorsum overhang in a patient with spina bifida — conventional bandaging alone would not address the most troublesome area of swelling. In this instance, a stump bandaging technique may be used. The toes would be combined with the forefoot, padding would be applied over a cotton liner and then the compression bandage can either be pleated back and forth across the 'stump' to cover the whole area or individual strips of short stretch cohesive bandage (Actico®, Activa Healthcare) can be used and then secured in place with a spiral application. This technique can facilitate rapid volume reduction to allow standard toe bandaging to be used, once distortion has reduced.

10 'FALLING OFF'

As toe bandaging is usually done with a retention or elastic conforming bandage, with little tension, it is inevitable that toe bandages fall off easily. This can be distressing for the patient who should be made aware that this can and often does happen, and is not a cause for concern. Toe bandages will simply be reapplied at the next compression application.

Discussion

Toe bandaging is often seen as complicated and potentially dangerous. If wrongly applied it can cause excoriation, constriction, splaying of the fifth toe due to more pressure over fifth metatarsal region, as well as pain due to cracks on the plantar side of toes (ILF, 2012). Any bandage applied incorrectly, or inappropriately, can cause damage and, therefore, should never be applied without appropriate training and education and the necessary competency. The advice of a Tissue Viability Nurse/leg ulcer specialist should be sought if the clinician requires training in this skill.

There are many excellent training images available online for toe bandaging, including videos from Activa Healthcare and Abertawe Bro Morgannwg University Health Board.

Conclusion

Toe bandaging is an excellent way to control and reduce swelling of the toes. It can help improve skin changes (e.g. papillomatosis and lymphorrhoea) and reduce the risk of bacterial and fungal infections. Due to the fact that toe bandaging may reduce the risk of toe swelling and possibly ulceration it should be considered for any patient undergoing compression bandaging of the lower limb(s). Once mastered, the technique can be easy to apply and is extremely cost effective. **WE**

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Figure 5. Haddenham Healthcare Microfine toe cap (cut to fit).

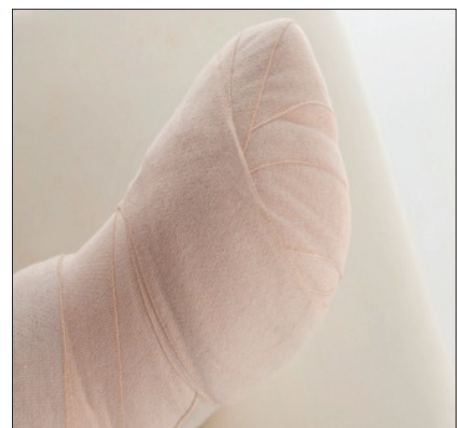


Figure 6. Stump bandaging using Actico (Activa Healthcare) short-stretch cohesive bandages.

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