A clinical audit of Actico cohesive short stretch bandages

Anne Williams gives an overview of Actico cohesive short stretch (inelastic) bandages in the management of lymphoedema.

Lymphoedema is characterised by an accumulation of fluid, proteins and other macromolecules leading to tissue swelling, skin changes and fibrosclerosis (Linnit, 2005). Bandaging is used in the management of lymphoedema to reduce limb volume, restore a normal limb shape, improve the condition of skin and tissues and manage symptoms such as lymphorrhoea. Short stretch (inelastic) bandages provide a semi-rigid, resistive support around the limb and produce high working and lower resting sub-bandage pressures, appropriate to effective oedema reduction (Figure 1) (Williams & Keller, 2005).

The Actico cohesive short stretch bandage is widely used in leg ulcer management. This paper presents findings from a clinical audit undertaken to evaluate the use of Actico bandages within a multi-layer bandaging system for patients with lymphoedema of the limb.

Evidence base
Decongestive Lymphatic Therapy (DLT) combines skin care, specialised massage (manual lymph drainage), exercises and compression therapy using bandages and hosiery in the management of lymphoedema (Földi et al, 2005). A randomised controlled trial has shown that a course of bandaging, followed by wearing of hosiery garments, is more effective than hosiery alone in the long-term management of lymphoedema (Badger et al, 2000). The likely physiological effects of compression on lymphoedema have been identified (Table 1) but the effectiveness of different bandaging systems on the lymphoedematous limb has not been fully explored.

Bandaging in lymphoedema
The lymphoedema bandaging system incorporates a variety of padding materials under several layers of short stretch bandages (Table 2). The padding layer protects the skin but is also used to correct shape distortion and establish a cylindrical and conical shape prior to application of short stretch bandages. Short stretch bandages are then applied, sometimes in several layers, to provide a graduated pressure profile, reducing from distal to proximal. Bandages are often reapplied daily during the initial oedema reduction phase to compensate

Table 1: Effects of compression on a lymphoedematous limb (Adapted from Földi et al. 2005)

- Reduced capillary filtration
- Fluid shifted into non-compressed areas
- Improved lymphatic transport
- Enhanced venous pump
- Reduction in fibrosclerotic tissue

With grateful thanks to participating centres/practitioners:
A. Batchelor, Specialist Lymphoedema Nurse, St Margaret's Hospice Taunton
M. Boyle, Specialist Lymphoedema Nurse, Forth Valley Lymphoedema Service
E. Jennings, Lymphoedema Nurse, Airdgowan Hospice
M. Key, Specialist Lymphoedema Nurse, Greater Glasgow NHS Board
M. Lewis, Macmillan Lymphoedema Specialist, Singleton Hospital, Swansea
U. Oja, Lymphoedema Therapist/Senior Physiotherapist, Trum
M. Todd, Specialist Lymphoedema Nurse, Greater Glasgow NHS Board
J. Wigg, Clinical Nurse Manager, Wolverhampton Lymphoedema Service

Anne F. Williams RGN, MSc, DN, RNT, Onc Cert is a Lymphoedema Specialist Practitioner, Dalkith, Scotland.

Article accepted for publication: December 2005
Clinical Audit

Table 2: Multi-layer lymphoedema bandaging system components

- Tubular bandage lining to protect the skin and absorb perspiration.
- Digit bandage (4–5 cm retention bandage) to reduce/ prevent finger and toe swelling.
- Padding to protect the skin and reshape the limb to a cylindrical and conical shape.
- Short stretch (inelastic) bandages to provide a semi-rigid casing around the limb, producing high working and lower resting sub-bandage pressures.

NB: The lymphoedema bandage system commonly covers the whole limb.

for changing shape and volume. Cotton short stretch bandages are commonly used in lymphoedema and the Actico short stretch bandage is similarly inelastic but also has cohesive qualities.

The audit

Method: The audit took place over a three month period and involved eight lymphoedema practitioners in the UK. All worked within an established lymphoedema service and were qualified in the decongestive lymphatic therapy (DLT) methods including manual lymph drainage and multi-layer lymphoedema bandaging. An audit tool was developed for the project. The audit protocol and tool were subjected to scrutiny by research and development units as relevant to the various practitioners.

Patients suitable for inclusion were those requiring multi-layer lymphoedema bandaging for lymphoedema of the upper or lower limb (BLS, 2001). Practitioners provided other treatments including manual lymphatic drainage, as required in the individual patient treatment plan. Padding materials and digit bandages were selected by the practitioners according to clinical need and Actico cohesive short stretch bandages were used to provide compression (Figure 1).

Outcomes

- Change in excess limb volume, expressed as a percentage of pre-treatment excess volume, in patients with unilateral lymphoedema.
- Change in total limb volume in patients with bilateral lymphoedema.
- Practitioner evaluation of bandage effectiveness, ease of application, patient comfort, and level of usefulness.
- Frequency of bandage application, width of bandages and padding used.

In measuring limb volume, seven practitioners used 4 cm circumferential measurements and the formula based on the volume of a cylinder (Kuhnke, 1976) and one service used the Perometer (an opto-electronic device). Where patients had unilateral lymphoedema, the swollen and unswollen limbs were compared and the excess limb volume and percentage excess volume were calculated. This enabled the post-treatment change in excess volume to be calculated as a percentage of the pre-treatment excess volume.

Results

The patients: Audit data were collected on 25 patients (Table 3). Nine had unilateral upper limb lymphoedema, all breast cancer-related. From the 16 patients with lower limb swelling, five were cancer-related (melanoma, genitourinary) and 11 had lymphoedema that was non-cancer-related including those with lymphovenous oedema, primary lymphoedema and lymphoedema secondary to trauma. In total, 18 patients had unilateral lymphoedema (nine upper and nine lower limb).

One of the 14 patients with lymphoedema secondary to cancer, a patient with upper limb lymphoedema, was categorised by the practitioner as being in the 'palliative' category (BLS, 2001). The mean age of all patients was 60 (range 7-85) including six males and 19 females.

The treatments: The length of treatment course ranged from 4-19 days (mean = 11). The number of bandage applications ranged from 4-10 (mean = 7). Twelve of the patients had daily bandaging (Monday-Friday) and 13 were bandaged 3-4 times per week, most commonly every second day.

Practitioners used digit bandages in around 80 per cent of patients, then shaped and protected the limb predominately with undercast padding bandages such as Cellona® and Flexi-Band and/or soft foam rolls such as Rosidal® soft. Actico cohesive short stretch bandages were applied in layers using spiral and figure of eight techniques as required. Actico 6 cm, 8 cm and 10 cm widths were used in upper limb bandaging; the 4 cm width was found to be useful for hand bandaging. The 8 cm, 10 cm and 12 cm width bandages were used on legs. In two patients, the practitioner combined the use of 100 per cent cotton short stretch with Actico as a final layer.

Limb volume change: The percentage change in excess volume in relation to the pre-treatment excess was 40 per cent for upper limb and 70 per cent for lower limb unilateral lymphoedemas (Table 4).

Table 3: Characteristics of patients (n = 25)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Upper limb (n = 9)</th>
<th>Lower limb (n = 9)</th>
<th>Lower limb (n = 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>9 (36%)</td>
<td>4 (16%)</td>
<td>6 (24%)</td>
</tr>
<tr>
<td>Men</td>
<td>0</td>
<td>5 (20%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>Mean: 62 (45-78)</td>
<td>56 (39-67)</td>
<td>62 (7-85)</td>
</tr>
<tr>
<td>Cause of lymphoedema</td>
<td>Cancer-related</td>
<td>9 (36%)</td>
<td>4 (16%)</td>
</tr>
<tr>
<td></td>
<td>Non-cancer</td>
<td>0</td>
<td>5 (20%)</td>
</tr>
<tr>
<td>Excess limb volume prior to treatment (% of unswollen limb)</td>
<td>Mean</td>
<td>54%</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Range: (21-104%)</td>
<td>(12-57%)</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Table 4: Change in excess limb volume

<table>
<thead>
<tr>
<th>Patient number</th>
<th>Excess limb volume (mLs) at start of treatment</th>
<th>Excess limb volume (mLs) at end of treatment</th>
<th>% Change in excess limb volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral upper limb lymphoedema</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient 1</td>
<td>734</td>
<td>420</td>
<td>43%</td>
</tr>
<tr>
<td>Patient 2</td>
<td>684</td>
<td>417</td>
<td>39%</td>
</tr>
<tr>
<td>Patient 3</td>
<td>1578</td>
<td>1244</td>
<td>21%</td>
</tr>
<tr>
<td>Patient 4</td>
<td>557</td>
<td>279</td>
<td>50%</td>
</tr>
<tr>
<td>Patient 5</td>
<td>342</td>
<td>309</td>
<td>10%</td>
</tr>
<tr>
<td>Patient 6</td>
<td>1664</td>
<td>675</td>
<td>59%</td>
</tr>
<tr>
<td>Patient 7</td>
<td>695</td>
<td>412</td>
<td>41%</td>
</tr>
<tr>
<td>Patient 8</td>
<td>1525</td>
<td>656</td>
<td>57%</td>
</tr>
<tr>
<td>Patient 9</td>
<td>1180</td>
<td>681</td>
<td>42%</td>
</tr>
<tr>
<td>Mean</td>
<td>995</td>
<td>566</td>
<td>40%</td>
</tr>
<tr>
<td>Unilateral lower limb lymphoedema</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient 1</td>
<td>4447</td>
<td>2967</td>
<td>33%</td>
</tr>
<tr>
<td>Patient 2</td>
<td>1390</td>
<td>-37</td>
<td>103%</td>
</tr>
<tr>
<td>Patient 3</td>
<td>3286</td>
<td>2018</td>
<td>39%</td>
</tr>
<tr>
<td>Patient 4</td>
<td>3577</td>
<td>82</td>
<td>98%</td>
</tr>
<tr>
<td>Patient 5</td>
<td>2274</td>
<td>1840</td>
<td>19%</td>
</tr>
<tr>
<td>Patient 6</td>
<td>2304</td>
<td>1045</td>
<td>55%</td>
</tr>
<tr>
<td>Patient 7</td>
<td>1307</td>
<td>-538</td>
<td>141%</td>
</tr>
<tr>
<td>Patient 8</td>
<td>2459</td>
<td>1489</td>
<td>39%</td>
</tr>
<tr>
<td>Patient 9</td>
<td>2205</td>
<td>-16</td>
<td>101%</td>
</tr>
<tr>
<td>Mean</td>
<td>2583</td>
<td>983</td>
<td>70%</td>
</tr>
</tbody>
</table>

Change in excess volume could not be calculated for those with bilateral swelling but an average of eight per cent reduction in the total limb volume was recorded for this group.

Practitioner evaluation

Table 5 highlights the findings from 21 completed forms as four incomplete forms were also received. Bandages were rated as very effective in 17 patients (81 per cent) and very useful for lymphoedema in 19 patients (90 per cent). In comparison to other short stretch bandages, Actico bandages were found to be more comfortable in 16 patients (76 per cent) and more useful for lymphoedema in 17 (81 per cent) patients. Some practitioners recorded additional comments (Table 6), describing benefits such as reduced bandage slippage, increased patient mobility and greater limb flexibility with the Actico bandages. These also showed some initial difficulties regarding bandage application in those unfamiliar with the cohesive bandage.

Discussion

The findings from this small audit of a convenience group of patients describe the use of Actico cohesive short stretch bandages in different types of lymphoedema and various age groups. Reduction in limb volume is comparable to other studies of Decongestive Lymphatic Therapy where changes in excess volume of 26 per cent (Johnson et al., 1999), 42 per cent (Szuba et al., 2000) and 38 per cent (McNeely et al., 2004) have previously been reported. Indeed, initial limb volume reduction appears to be excellent in some patients despite the relatively limited number of times the bandages were reapplied. Subsequent limb volumes over the longer term appear to continue to progressively decline. Data indicate that intervals between bandage reapplication can be extended, as Actico bandages remain secure. Choice of non-daily bandaging in this audit was according to need and practitioners availability but suggests that this is a suitable approach that may require fewer resources. The cohesive nature of Actico may reduce the risk of slippage as limb shape and volume modify. Additionally, the use of foam padding over the entire limb or as a strip at the top of the limb may further secure the bandage system in place.

The 12cm Actico bandage was also used as a hip spica in two patients to prevent slippage and provide compression to an oedema at the hip and root of the limb.

Three practitioners highlighted resource issues as Actico bandages could not be reused and washed as with other cotton stretch bandages. Initial difficulties with bandage application experienced by practitioners unfamiliar with Actico, also emphasise the need for
Table 6: Summary of comments from practitioners

- Patient felt Actico bandages were more effective and more comfortable than previous bandages.
- Patient had no cramp as experienced with other cotton short stretch bandages.
- Patient found it fairly easy to mobilise and exercise with the Actico bandage. It is lighter and less bulky than other bandages.
- Bandage did not slip between treatments.
- Patient says they (Actico bandages) seem to allow for more flexibility but feel as strong and rigid as other short stretch bandages.
- Very useful for lymphovenous disease - bandages hold better so patient has to attend clinic less.
- I found them more difficult to apply around the knee and found they cut in on a couple of occasions; (this was) resolved with extra padding.
- At first I had some difficulty applying it when it wrinkled; it seemed to maintain compression better.
- Patient found them lighter and more comfortable than previous short stretch.
- Kept arm very mobile and (achieved) similar volume loss to previous course of treatment.
- Once you get used to using them they are quicker and easier to use and reduce bandage application time. The 6m length also means fewer bandages are required.
- Lighter (in weight) for a palliative patient.
- I changed to 1 layer of Comprilan and 1 layer of Actico on top after first week with excellent result.
- Main problem is one time use; (this is) hard on resources.

preparation and training of practitioners using this bandage. It is interesting, however, that once familiar with using the bandage, 17 (81 per cent) practitioners reported Actico to be similar or easier to apply than other short stretch bandages.

Conclusion

Actico bandages appear to be comparable to other short stretch bandages and provide additional benefits including improved patient comfort and mobility and less bandage slippage. Comparative and longitudinal research studies are now required to further inform practice in lymphoedema bandaging.

References


