Primary lymphoedema: a case study

Maureen Barrett discusses the treatment of primary lymphoedema.

This case study offered an ideal situation for reflective learning as lymphoedema is a difficult condition to treat and is not common enough to provide experience and confidence in its treatment.

Mrs C, a 75 year-old lady was referred to the district nursing service following a small trauma to her right calf. The wound was approximately 1.25cms by 1.25cms in diameter. Unfortunately, prior to referral, the lady had applied cream to her legs in an attempt to heal the wound. This meant there would be difficulty in using adhesive dressings, as they would be unable to remain in place.

When Mrs C attended the clinic, it was fairly obvious that there was a problem with lymphatic drainage, which had led to lymphoedema and had caused the ulcer breakdown in the tissues. Mrs C had been aware of her swollen legs for 20 to 30 years. Her general health and nutrition was average but her mobility was restricted (she used a frame) due to lymphoedema.

Lymphoedema

Lymphoedema is a chronic swelling resulting from the failure of the lymph drainage system (Jefferis, 1992) and can affect anyone at any time. Although this case study is primarily concerned with lower limb oedema, upper limb swelling can be associated with breast cancer and can also affect any part of the body or internal organs.

There are two main types of lymphoedema - primary and secondary lymphoedema. Primary lymphoedema (intrinsic abnormalities) is usually established at birth and develops at different times during a life span but is more common in adolescence. Secondary lymphoedema occurs following surgery or radiotherapy when the lymphatic system becomes damaged. Infection, severe injury, burns, or trauma may also be a cause. Mrs C’s condition was primary lymphoedema.

The lymphatic system consists of a complex set of vessels, which mimic the venous system but have a complimentary role to play in returning fluid and large molecules of protein from the interstitial spaces back into the main venous system. This is accomplished by contraction of local tissues, valves that prevent back flow and by contractions within the vessel walls (Badger & Jeffs, 1996). This system collects 10 per cent circulatory/tissue waste, filtering it through the lymph nodes in order to remove any foreign matter. The action of the lymph nodes protects the body by initiating immunological reactions when required.

The high protein concentration of the stasic fluid leads to hypertrophy of the skin, chronic fibrosis, thickening of the subcutaneous tissues with reduced pitting and enhanced natural skin folds. (Badger & Jeffs, 1996). There is also a positive Stemmer’s sign – an inability to pick up a fold of skin at the base of the second digit and this was identified by the GP’s original assessment (first paragraph). Fluid recedes only slightly with bed elevation and there is an increased susceptibility to infection (Brunner & Suddarth, 1975). The hypertrophy of the skin, skin folds and swelling of the limbs is often referred to as elephantiasis.

The lymph system returns blood to the heart in much the same way as the heart. Negative thoracic pressure from breathing creates a ‘suction’ effect on lymphatic drainage and ‘pulls’ the blood in the direction of the heart. At the same time, exercise causes the muscles of the legs to ‘massage’ the lymph vessels and squeeze the lymph out of the vessels and up toward the heart. Elevation of the limb may assist with this process. Therefore, treatment of primary lymphoedema could be seen as similar to that of venous insufficiency – it compression and exercise. Jeffs (1992) described three aims of compression in lymphoedema:

- To limit the accumulation of fluid in the subcutaneous tissue.
- To provide an even pressure gradient (graduated compression) to encourage fluid to move to the root of the limb.
- To provide the muscle with firm support, thus enhancing the pumping action of the muscles during normal and specific exercise.
Lymphoedema can lead to great psycho-sociocultural distress as the patient contends with problems such as reduced mobility, discomfort and altered body image (Tobin et al., 1993; Woods, 1993). All of these identified problems were experienced by Mrs C. Unfortunately, lymphoedema is not fully understood and there may be poor and inadequate nurse involvement in patient rehabilitation with confusion among nurses who do not fully understand the application of rehabilitation (Gibbon & Kenny, 1993). Therefore, a knowledgeable psychological assessment of Mrs C was as important as her physical assessment – leading to appropriate treatment in support of her individual requirements. The community nurse with the responsibility for caring for Mrs C was determined to provide evidence-based care.

**Treatment and Care**

Appropriate skin care and prevention of infection are important cornerstones of effective lymphoedema management, which can play a vital role in patient comfort and acceptance of swelling. Management of the patient or client with lymphoedema requires input from an appropriately qualified and skilled practitioner, however skin care is one area of care, which may be addressed by all levels of healthcare professionals involved in direct patient care (McClaren, 2001). Therefore, skin care was of primary importance for Mrs C and therefore, her legs would continue to be bathed and creamed each time the legs were exposed for treatment.

Compression therapy would assist with reducing lymphoedema and would also increase healing of the wound. However, this would require the excess fluid to move into the general circulation and this has the potential to reduce oedema fairly rapidly which could flood the system with fluid – a dangerous potential in heart disease as the heart is unable to cope with the excess fluid load. Mrs C’s general practitioner (GP) examined her to ensure an absence of heart or lung conditions that may be detrimental when using compression therapy and to reduce some of the excess fluid, the GP prescribed Frusemide increasing it to 125mm during the time of therapy.

Prior to any decision on bandaging requirements, (as this lady’s entire leg was also swollen from poor drainage of lymphoedema), it was important to assess the size of the thigh as well as the calf. This would provide a baseline on which to measure any future reduction in size following compression bandage treatment and diuretic administration.

At this point in the treatment, a multilayer bandage was used consisting of orthopaedic wool layer, a crepe layer and a long-stretch bandage layer. Within three weeks, there was a reduction on the size of the legs (Table 1).

Although the reduction in oedema was excellent, the bandages created a problem as they continually rolled down and had to be changed on a daily basis. However, the reduction in oedema allowed the community staff nurse to obtain Ankle Brachial Pressure Index (ABPI) reading with a Doppler ultrasound machine. The ABPI was 0.93 (right leg) and 0.10 (left leg) with excellent bi-phasic sounds (demonstrates elasticity within the arteries).

The community nurse wished to reduce the number of dressing change requirements while at the same time decreasing oedema in the thigh and knees. This would require a change of treatment to one that would reduce oedema with bandages that would remain in place.

Prior to the change of treatment, the community staff nurse recognised that she needed to be fully informed. To ensure that treatment and the type of bandage was ideal in this individual case the community staff nurse undertook a literature review of lymphoedema and bandaging. Information was scarce, both in books and medical journals and it was difficult to know where to seek advice, particularly as a lymphoedema service was unavailable. To overcome this problem, several manufacturers and distributors were invited to offer the required advice and education; only one company responded (Activa). The representative from that company spent time demonstrating how their short-stretch cohesive bandage (Actico) should be applied in the case of lymphoedema. The representative from the company suggested a kneecap appliance to reduce the oedema over the knee while maintaining full movement for mobilising.

The application of the short-stretch bandage (toe to knee) proved to be easily achieved and remained in situ, unlike the results of the 3-layer system that had been tried earlier in this lady’s care. However, the shape of this lady’s leg meant the thigh was not so easily bandaged. Applying short-stretch bandage knee to groin required three hands, one to hold the bandage in place and the

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**Table 1: Three weeks after treatment commenced**

<table>
<thead>
<tr>
<th>Original Measurement</th>
<th>New Measurement</th>
<th>Reduction</th>
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<tbody>
<tr>
<td>Right ankle 37in</td>
<td>Right ankle 29in</td>
<td>8in</td>
</tr>
<tr>
<td>Right calf 59in</td>
<td>Right calf 45.5in</td>
<td>13.5in</td>
</tr>
<tr>
<td>Left ankle 36in</td>
<td>Left ankle 28in</td>
<td>8in</td>
</tr>
<tr>
<td>Left calf 55in</td>
<td>Left calf 41in</td>
<td>14in</td>
</tr>
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other two used to apply the bandage. A decision was made to bandage groin to knee in a figure-8 style, with the lady standing in an upright position. It took two and a half bandages for each thigh but the bandage remained in place and the lady claimed it to be quite comfortable.

During the first two weeks, the size of the leg required two short-stretch bandages. However, by the second week, this had been reduced to one short-stretch bandage. The kneecap device did not prove effective in reducing knee oedema so a smaller size was used to overcome the problem but this did not make the required difference. The calf and thigh had reduced considerably and, at this point, the community staff nurse was able to consider using compression stockings. Therefore, at the end of week five, thigh-length hosiery (held up with an NHS suspender belt) was applied. Although these stockings were ideal for the calf area, they proved too tight for the thigh and had to be pulled high into the groin. The community nurse padded the leg (under the stocking) with orthopaedic wool and this helped for a time. However, the warmer weather arrived and a sweat rash appeared. Mrs C removed her stockings and refused to wear them again. Mrs C was aware that her legs would become swollen again and was distressed at the idea. Nevertheless, the oedema returned and within one week, the legs had unfortunately returned to the original size and treatment became a priority once again.

Conclusion
This case provided a strong learning curve for the community nurse who was now able to provide a complete plan of treatment for the future. This lady would now require re-treatment of compression and from the lessons learned in this case study, would be provided with Actico short-stretch cohesive bandage from the outset as it had proved to be an excellent method of reducing lymphoedema. Once the oedema is under control, the community staff nurse could progress to application of individually tailored hosiery.

The case study had provided an interesting progression toward knowledge and evidence based care. Although mistakes had been made along the way, the obtained experience would lead to final excellence in care for this lady and would provide a basis for care of other patients with similar conditions in the future.

References