

In this article...

- The pathophysiology of lower-limb oedema/lymphovenous disease
- Clinical and practical challenges of caring for patients with lymphorrhoea
- Treatment and management strategies to avoid complications

‘Leaky legs’: strategies for the treatment and management of lower-limb lymphorrhoea

Key points

1 Grossly oedematous and leaking legs present management challenges for both nurses and patients

2 Patients with lymphorrhoea experience enormous medical and practical issues

3 The nurse’s role is to address the cause of lymphovenous disease while reducing fluid accumulation, leg swelling and risk of infection

4 If cellulitis occurs it must be treated as a priority

5 Proactive management of lower-limb oedema as soon as it presents helps to avoid complications such as lymphorrhoea

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Abstract The management of lower-limb lymphovenous disease and lymphorrhoea (‘leaky legs’) is challenging. The root cause of the disease must be addressed and the risk of infection minimised while symptoms are treated with compression, dressings, topical agents and barrier products. Lymphorrhoea causes significant medical and practical issues for patients and nurses, but can be avoided if lower-limb oedema is treated early. This article describes the pathophysiology, management strategies, and clinical and practical issues associated with the condition; it updates an article published in 2003.

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The management of lymphorrhoea (grossly oedematous legs) poses major challenges because the condition is often accompanied by the leakage of considerable volumes of fluid – indeed the condition is commonly known as ‘leaky legs’ (Lymphoedema Framework, 2006). This article describes the pathophysiology of lymphovenous disease, strategies to help prevent or treat complications, and clinical and practical issues for patients and health professionals; it updates a previous *Nursing Times* article (Anderson, 2003a). Lymphorrhoea can affect any limb (Renshaw, 2007), but this article focuses on the leg.

Lower-limb oedema

Lower-limb oedema first manifests as swelling at the ankle; if this is not controlled, swelling quickly extends to the foot and leg. Swelling is initially soft and ‘pitting’ but, as the problem becomes

chronic, the tissues harden and it becomes increasingly difficult to reduce the oedema. In the early stages, simply sleeping and sitting with the ankles elevated above hip level and applying mild compression will reverse the oedema, but if its cause is not addressed, these measures will not prevent the condition from becoming chronic. The prevalence of diagnosed chronic oedema is around four per 1,000 of the UK population, but this figure is widely thought to be an underestimate (Todd, 2014).

Lymphovenous disease

Oedema occurs when capillary pressure exceeds the pressure of fluid in the tissues, causing fluid to leak from the circulatory system and accumulate in the tissues (Lawrance, 2009). The lymphatic system is responsible for fluid drainage, but if filtration from the capillaries (Fig 1) and venules exceeds drainage capacity for too long, limb swelling occurs (Mortimer and Rockson,

Fig 1. Detail of a lymphatic capillary

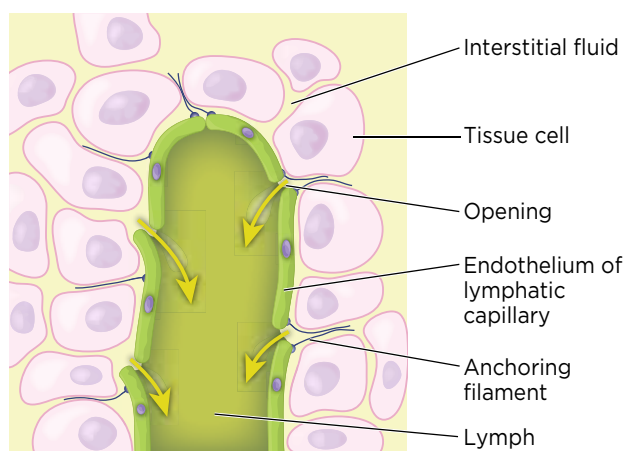
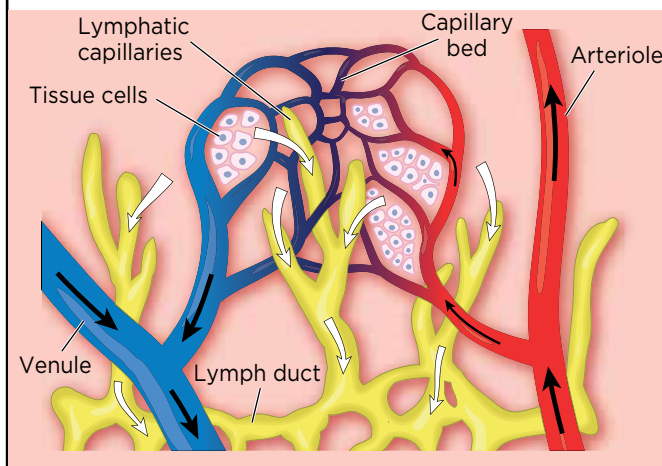


Fig 2. Circulatory and lymphatic systems: a joined-up network



2014). The blood circulation and lymphatic systems belong to a network (Fig 2), so extra congestion and pressure in the circulatory system leads to extra volume and pressure in the lymphatic system, increasing the leakage of fluid into tissues.

Lymphoedema occurs when a problem in the lymphatic drainage system causes fluid to accumulate in the tissues; it can be primary (whereby a genetic trigger causes the system to fail) or secondary (whereby trauma causes the failure). Sometimes the drainage vessels can be damaged by infection such as cellulitis (Lymphoedema Support Network, 2015).

Chronic oedema is caused by problems with venous return. This usually happens because the valves in the veins fail to close properly, resulting in a backflow of venous blood leading to higher than normal pressures in the veins (venous hypertension). The additional blood causes the venous walls to stretch and plasma to leak into the tissues; the veins are unable to drain the fluid back from the tissues because they are already congested.

Lower-limb oedema tends to be a mix of all the above, and is known as lymphovenous disease (Rockson, 2010).

Lymphorrhoea

Understanding of the fluid drainage mechanism has evolved in recent years. There is now more emphasis on the role of the lymphatic system to drain interstitial fluid (fluid in the tissues), rather than on venules in the circulatory system reabsorbing interstitial fluid (Jacob and Chappell, 2013). There is still much that we do not understand (Levick and Michel, 2010), but we know that improving lymphatic drainage as much as possible is a priority.

As lymphovenous disease progresses, especially if it is not well managed, legs can become grossly oedematous; swelling causes the skin to stretch and small blisters appear. Fluid then leaks out and has nowhere to go because both drainage systems (circulatory and lymphatic) are too congested (Elwell and Craven, 2015). The leg appears shiny with moisture or, more commonly, fluid is seen running down the leg (Elwell and Craven, 2015).

The fluid leaking from the leg is transudate (fluid that has passed through a membrane); it has high fluidity and low protein content (as opposed to wound exudate).

Implications for patients

Patients with lymphorrhoea report intense pain (Lymphoedema Framework, 2006) due to swelling, as well as irritation, maceration (whitening and 'bogginess') and excoriation (redness and rawness) of the skin due to wetness. Eventually the skin breaks down into at least one ulcerated area, and the risk of infection increases (Quéré and Sneddon, 2012). Patients also experience high levels of discomfort, embarrassment and inconvenience, not to mention expenses. They have to live with a leg that is extremely swollen and heavier than normal – imagine trying to walk up or down stairs with a limb so heavy you can barely lift it, or to walk without being able to flex your ankles because they are so swollen. Patients will also be constantly wet and have permanently wet footwear, clothes and bedding (Morgan et al, 2011).

Risk of infection

If fluid accumulates in the tissues and is not drained, there is a risk of infection. The lymphatic system is a key element of the

immune system, so if it is compromised, the risk of infection from seemingly minor factors, such as scratches or insect bites, increases and can quickly become serious (Mortimer and Rockson, 2014). In lymphorrhoea, the skin is broken and very wet, which increases the risk of infection; the risk of sepsis is also high (Elwell and Craven, 2015). Acute infection itself results in tissue oedema, and will therefore add to the existing oedema.

Cellulitis is a potentially life-threatening subdermal and subcutaneous tissue infection commonly caused by *Streptococcus pyogenes* (two-thirds of cases) and *Staphylococcus aureus*. It is treated with oral antibiotics in milder cases, or intravenous antibiotics warranting hospital admission in more severe cases (Opoku, 2015). Erysipelas is an infection affecting the superficial layers of the skin and is often caused by group A beta-haemolytic streptococci. Cellulitis and erysipelas, which are often indistinguishable but almost always unilateral (Opoku, 2015), occur in patients with lymphovenous disease and lymphorrhoea.

Treatment strategies

Treatment of lymphovenous disease hinges on the use of compression, leg elevation and exercises that increase movement in the ankle and calf muscles (O'Meara et al, 2012). Oedema must be managed to reduce congestion and swelling but treating infection, if present, is a priority. In the presence of infection, the skin will be particularly vulnerable to breakdown and the patient may experience intense pain, so compression and limb management will need to be conducted more frequently, and compression can be applied at lower pressures than normal. Once the infection is

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under control, management can focus on reducing swelling and leakage.

Managing lymphorrhoea can be extremely difficult. There are many reports of patients resorting to placing their leg in plastic bags or using nappies, sanitary towels or incontinence pads in an effort to manage the volume of fluid. Nurses may use multiple dressings, which will need to be changed frequently; this is both costly and time consuming.

Compression

Compression comes in many shapes and forms, including bandages, hosiery, wrap systems and pneumatic compression. The key is to select a technique that applies pressure firm enough to counteract the tissue pressure, thereby squeezing the veins and valves to stop the backwards flow of venous blood. This will reduce pressure in the veins and lymphatic vessels, allowing more fluid to flow back into the drainage system (O'Meara et al, 2012).

Sustained compression will reduce swelling; the correct compression will result in a fairly rapid reduction of oedema, so it must be frequently readjusted to ensure a tight enough squeeze on the leg. When bandages are used, they must be reapplied as soon as they feel loose. When large volumes of fluid are leaking it may be necessary to apply more sub-bandage padding than usual, but this can be reduced once the leakage diminishes (Renshaw, 2007). Renshaw (2007) suggests that short-stretch bandaging can be more comfortable than medium- or long-stretch, as it applies a low pressure when the patient is resting.

Hosiery is not normally used when the leg is leaking, because applying and removing it when the skin is so fragile increases the risk of trauma, while constant contact with wet material can also damage the skin. However, once lymphorrhoea is under control, hosiery can help reduce swelling (Lymphoedema Framework, 2006). If compression hosiery is to be used, the leg will need to be re-measured to ensure the correct size is used.

The newer wrap systems can be adjusted *in situ*, but if there has been a significant reduction in limb size, they will need to be re-measured and cut. Patients may be able to make adjustments themselves, but re-measuring and cutting or replacing the wrap system must be done by a health professional.

Whatever system is chosen, it must be acceptable and tolerable for the patient. In the acute treatment phase, materials that

Box 1. Documenting progress

Documenting assessments, treatments and outcomes is a requirement of good professional practice (Nursing and Midwifery Council, 2015), but it is also part of good management and can be motivating for patients and nurses alike.

Regularly measuring limb circumference at the ankle and calf allows nurses to evaluate the effect of treatment. Sketches or, better still, good-quality photographs, will also help gauge progress and detect any deterioration or breakdown of the skin, thereby enabling complications to be treated early. Measurements and sketches/photographs also support good communication between health professionals, such as when a general practice nurse needs specialist advice.

When taking pictures of patients, nurses must follow local policies regarding consent and data management (Institute of Medical Illustrators, 2012).

have become wet will need to be frequently changed – cost-effective materials should, therefore, be used.

Dressings

Dressing technology has steadily improved in the past decade. Modern materials such as alginate, hydrofibres and absorbent granules increase the capacity of dressings to absorb fluid. While most dressings are absorbent to some degree, some are particularly absorbent and are often called 'super absorbents'. Other innovations include gelling fibres – complex fibre structures and/or silicone – and products that control the direction of fluid flow to protect the skin (Cowan, 2016).

Despite these advances, many challenges remain. The quantity of fluid can quickly exceed dressing capacity, while it can be difficult to find dressings that are large enough if the whole leg is leaking. As dressings are absorbent, they accumulate a lot of fluid, becoming heavy and prone to slippage; this may pull and tear skin that is already vulnerable. Some dressings are absorbent because they are bulky, so they make an already-swollen limb even bigger.

One of the principles of compression is that higher pressures are applied on smaller circumferences so that a larger circumference results in lower sub-bandage pressure (Thomas, 2014); this means that, when there is a lot of extra padding adding

to limb circumference, there is a risk that not enough pressure is being exerted on the leg. When super-absorbent dressings are swollen with fluid, they may exert additional localised pressure, leading to changes in the pressure profile and possibly to pressure damage.

Nurses should refer to local dressing formularies and discuss any challenges with a tissue viability nurse or other professional with responsibility for the formulary. Whichever dressing is selected, it should be a comfortable fit, and should not cause discomfort when it has reached its absorbency capacity, or hold exudate against periwound skin.

Topical agents

Some astringent and mildly antiseptic substances are used on very wet skin, but their efficacy is debated. Treating very wet skin with topical substances is a challenge; decisions must sometimes be based on clinical experience rather than evidence, as there is little evidence on the subject. The key objective is to manage the underlying problem and not use topical agents for prolonged periods. For example, potassium permanganate solutions can help in acute episodes of lymphorrhoea but should not be used for more than 10 days (Elwell and Craven, 2015). They must be used and disposed of according to the manufacturer's instructions, so skin, nails, clothing and household items are protected from staining (Nazarko, 2013). Although the evidence base is weak, potassium permanganate is reported to be useful in wet, weeping legs. Its use should be discontinued when the leg dries (Anderson, 2003b).

Antimicrobial agents such as silver, iodine and honey can be applied, especially in the presence of wounds, when there is an infection or when the risk of infection is high. Current practice is not to use them for more than two weeks at a time, so their use must be judiciously timed (Beldon, 2014). Dressings containing antimicrobials should be selected to provide maximum absorbency and comfort.

Barrier products

In lymphorrhoea, skin integrity is compromised not only by the swelling and fluid, but also the enzymes contained in the fluid, which can destroy healthy tissue (Adderley, 2010). The skin therefore needs to be protected with products that isolate it from the fluid. So-called barrier products come in various forms, including creams, sprays and sticks. Silicone plays a key role: it forms a coating that the fluid

sits on, rather than resting directly on the skin. Manufacturers' instructions must be followed carefully so the quantity of product applied is sufficient to create a barrier but does not hinder normal vapour loss through the skin (Draeos, 2012).

Diuretics

Both Al-Niaimi and Cox (2009) and Mortimer and Levick (2004) state that diuretics are not generally helpful in the management of lymphovenous disease. Keast et al (2015) add that there is no, or only minimal, response to diuretics in chronic oedema caused by lymphovenous disease. However, lower-limb swelling and fluid leakage can have various causes, including renal disease, cancer, drug therapy and heart failure (Keeley, 2008), and diuretics may help reduce lower-limb oedema caused by heart failure (Khatib, 2011). If heart failure is the underlying problem and beyond appropriate medical management, compression therapy may be contraindicated; it should only be used under specialist supervision until arterial flow to the extremities is determined (Top et al, 2009).

Practical issues

In their study of complex lymphoedema, Morgan et al (2011) highlighted a link between obesity and lymphoedema and the increased incidence of lymphorrhoea. They also explored issues around patients' beliefs and motivation to participate in their treatment plans. This study focused on lymphoedema, but the management of chronic oedema involves many of the same issues, especially in patients with heavy and already-vulnerable limbs.

Specialist equipment such as therapy couches may be required to manage heavy patients. Sometimes two health professionals are needed to wash the patient, apply topical treatments and/or barrier products, bandage limbs and treat lymphorrhoea (Morgan et al, 2011). Nurses must be prepared to deliver 'intensive care' for the leg in the early stages, which will help avoid complications and ultimately be less costly and risky than having to manage wet and swollen legs over long periods.

From a nursing perspective, patient management consists mostly of pain control (Lymphoedema Framework, 2006) and local management of the fluid. If diuretics are used, patients will need additional support to manage increased urine output, both in terms of extra visits to the toilet and skin integrity; this may make some patients reluctant to take diuretics. Practicalities and implications must be

Box 2. Online resources

- Information on dressings can be found at:
www.woundcarehandbook.com
- Information on erysipelas and cellulitis can be found at:
Bit.ly/DNZCellulitis
Bit.ly/DNZErysipelas
- The British Lymphology Society has produced a consensus document on managing cellulitis in lymphoedema:
Bit.ly/BLSCellulitisLymph

discussed with patients when treatment is being planned; recording the progress of therapy can be useful to motivate them (Box 1).

Conclusion

Managing oedematous and leaking legs is a clinical challenge for health professionals and for patients. Nurses need to recognise what is happening and seek to address the root cause, while using absorbent materials and, where possible, compression therapy to reduce the accumulation of fluid. Cellulitis can be prevented by good oedema and skin management, but if it does occur it must be treated as a priority. An 'intensive treatment' approach to lower-limb oedema in the early stages will avoid many complications, including lymphorrhoea, that arise if the condition is not well managed. Box 2 lists online resources that can be used to support management plans. **NT**

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- Diagnosing and managing lower limb cellulitis
Bit.ly/NTLowerLimbCellulitis