

ASSESSMENT OF A VENOUS LEG ULCER

A thorough and accurate assessment of patients who present with leg ulceration is essential to ensure timely and appropriate treatment. Assessment should, however, be ongoing as signs and symptoms can change and nurses need to be able to monitor the impact of their interventions.

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Seventy per cent of all leg ulcers that develop in Western countries are caused by venous disease, yet it has been highlighted that the knowledge and skills of nurses often falls short of what is expected and that there are wide variations in assessment practices (Browse and Burnand, 1982; Moffatt and Franks, 2004).

With the ever-increasing age of the UK population, venous leg ulcer prevalence could well increase. Accurate patient assessment is the key to successful leg ulcer management and this article will provide nurses with evidence-based information to enable the accurate and thorough assessment of patients with venous ulcers. It will explain the reasons why venous ulcers occur and the specific factors which influence their development. Patient assessment and identification of skin changes will also be discussed, using photographs to support learning and understanding.

Background

Venous leg ulcer management accounts for a significant proportion of district and practice



Figure 1. An example of chronic venous leg ulceration.

nursing time, partly due to the ageing population. It is well recognised that education and training, particularly in leg ulcer management, can improve health outcomes (Clarke-Moloney et al, 2008), yet surprisingly there is no national guidance on what levels of training are required in leg ulcer care. There is, however, a consensus that there needs to be a commitment to make training on the assessment and management of leg ulcers a mandatory part of GP and community nurse training (Royal College of Nursing [RCN], 2006).

Prevalence

Between 1.5 and 3 out of every 1,000 people have active leg ulcers at any one time, with the prevalence of the condition in people aged over 80 years increasing to approximately 20 in 1,000 (Callum et al, 1985). There is no difference in prevalence

between socioeconomic classes, however in people from lower social classes it is recognised that leg ulcers can take longer to heal.

If not assessed and managed appropriately, venous leg ulcers can affect a patient's quality of life and become an economic drain on healthcare services. About 80% of patients with venous leg ulcers are managed entirely in the community and the cost to the NHS is estimated at around £400 million a year (Simon et al, 2004).

This is why assessment of patients who present with skin breakdown in the lower limb is essential at an early stage to prevent the condition from becoming chronic (*Figure 1*).

Cause of venous leg ulcers

Venous leg ulcers are caused by sustained high pressure within the venous system, known as venous hypertension. Venous blood flow



Figure 2. Pigmentation of the lower leg with ankle flare.

takes blood back to the heart through the deep veins of the leg — namely the femoral vein, popliteal vein and the anterior and posterior tibial veins. Superficial veins, the long saphenous and short saphenous veins, are found nearer the surface of the leg and are connected to the deep veins by perforator veins, which allow the blood to flow one way into the deep veins.

All of the veins in the leg have valves to make sure that the blood flows back to the heart, however if the valves are damaged by surgery, injury or thrombosis they allow the blood to flow back into the

deep veins causing an increase in pressure. As this pressure rises, the superficial veins become enlarged and chronic venous hypertension develops, which is the main cause of venous leg ulceration. It is important for nurses to understand the cause of venous hypertension and the features that present in the lower leg in order to accurately assess and plan appropriate care.

Patient assessment

The RCN guidelines (2006) suggest that a full clinical history and physical examination is conducted for any patient that presents with either their first or a recurrent leg ulcer. This is to identify the underlying cause of the ulceration and assist in planning the correct treatment pathway. The RCN recommendation is based on a consensus opinion as there is no research that compares patients' clinical history and examination with healing outcomes.

The following information forms an essential part of the overall assessment to identify if the leg

ulcer is caused by venous disease. Many trusts have developed specific leg ulcer assessment forms to capture this information and to guide the nurse as to the relevant questions to ask patients.

Assessment of venous risk factors should include:

- » Family history of venous disease
- » History of varicose veins and whether they have been treated or not
- » Proven diagnosis of deep vein thrombosis (DVT) identifying which part of the leg was affected. This is a common cause of venous ulcers
- » History of inflammation of the vein (known as phlebitis) and whether or not it was a single or recurrent episode
- » History of surgery, fractures or trauma to the lower leg, which may have damaged the valves in the veins
- » Occupation (some jobs involving prolonged standing or sitting can increase risk)
- » Obesity and multiple



Figure 3. Gravitational eczema of the lower leg.

pregnancies — this causes pressure on the venous system.

Skin assessment

When pressure rises in the veins of the lower leg over a prolonged period of time the following skin changes occur:

- ▶ Pigmentation in the gaiter area of the leg between the ankle and the calf (*Figure 2*)
- ▶ Thickening of the subcutaneous tissue
- ▶ Oedema
- ▶ Gravitational eczema/stasis dermatitis (*Figure 3*)
- ▶ Ankle flare (*Figure 2*)
- ▶ Atrophie blanche (particular type of scar arising on the lower leg).

A collective term for these changes is lipodermatosclerosis.

The patient may also experience aching or heaviness in the legs, tortuous varicose veins in the thigh or lower leg (*Figure 4*), itching over engorged veins and occasional tenderness and redness in the lower leg. These features are described in more detail in (*Table 1*).

Assessment of leg ulcers

It should be noted that the following signs and symptoms are present in some form or other in the majority of patients who present with venous disease. However in others, indications are not classical and require more in-depth assessment.

Where is the leg ulcer?

Venous leg ulcers are usually sited in the gaiter area of the lower leg between the calf and the ankle. They tend to be shallow with flat wound margins. They can, however, occur around

Table 1.

Signs of venous hypertension

Skin changes	Causative factors
Brown/pink discolouration of the skin between the ankle and the calf	Prolonged high pressure in the veins forces the red blood cells to leak out into the tissues. Haemoglobin in the red blood cells breaks down into haemosiderin, which is then permanently deposited into the tissues
Thickening of the tissues beneath the skin. The leg shape can change and is often referred to as an inverted champagne bottle shape	If high pressure in the veins persists, fibrous tissue is deposited in the deep dermis and the fatty layers of the skin. This causes a thickening of the tissues in the gaiter area
Dry, red itchy eczematous skin on the lower leg	Raised venous pressure causes an increased capillary permeability and leakage of waste products occurs causing irritation in the tissues of the lower leg
Dilation of the small blood vessels around the inner ankle, known as ankle flare	When the deep and superficial veins become full and under pressure, the venules (small blood vessels) at the end of the venous system become enlarged. This is most obvious around the inner ankle area
White, smooth areas of thin skin which are pale in colour with visible capillaries, known as atrophie blanche	The causes are not clear, however, it is felt that blockages occur in the blood vessels in the middle and deep dermal layer of the skin
Prominent dilated veins	Defective or damaged valves cause a backflow of blood and a build up of pressure within the veins

the ankle where they tend to be multiple, small and painful (*Figure 5*).

How did the ulcer start?

It is important that the nurse asks the patient whether the ulcer just appeared or if there is a history of trauma or infection in the leg. It is also important to ascertain how long the ulcer has been present.

Many patients describe minor injury and subsequent failure to heal as the cause, while others will say that the ulcer developed in isolation. A past medical history may also aid diagnosis. Venous ulcers are generally slower in growth than arterial ulcers.

Is there a previous history of leg ulceration?

If the patient has had ulcers in the

past, this may indicate progressive venous disease, which may require surgical intervention to reverse venous incompetence. It can also indicate that a patient may not be wearing their compression hosiery, if already prescribed, or that the hosiery is the wrong size.

How large is the ulcer?

It is important that the size is documented at the first and subsequent assessments in order to evaluate the impact of any treatment plan. A venous leg ulcer treated with compression bandages should show good signs of healing within 12 weeks, however if the ulcer is enlarging or remaining static despite the application of correct evidence-based treatment, further investigation such as wound biopsy needs to be considered.



Figure 5. Venous ulcer sited on the ankle.

What are the characteristics of the wound bed?

In any assessment of venous leg ulcers it is important that the nurse establishes the state of the wound bed. The following elements are crucial:

- ▶ How much of the ulcer bed is viable tissue; how much is non-viable?
- ▶ Is there any inflammation or signs of infection?
- ▶ How much exudate is present?
- ▶ What is the condition of the wound edges? Are they flat or rolled?

Venous ulcers can present with a mixture of granulation tissue and slough. If very thick slough or black eschar is present, it usually indicates arterial insufficiency.

Wound infection is indicated by changes in the ulcer, the surrounding skin, the level of exudate and the amount of pain.

As Collier (2004) states, it is important to have a clear understanding of the terms used for wound infection. The most commonly used terms include:

- ▶ Wound contamination: where bacteria are present without any host reaction
- ▶ Wound colonisation: where bacteria begin to multiply and can cause a host reaction
- ▶ Critical colonisation: where bacteria multiply and cause early signs of a problem, such as a delay in healing and increased pain but no overt host reaction
- ▶ Infection: where the multiplication of bacteria causes a host reaction, which is present in the ulcer and the skin.

Some patients with a wound infection can also develop systemic symptoms such as pyrexia (fever), rigors

(exaggerated shivering) and tachycardia (rapid heartbeat). Local signs of infection include redness of the skin around the ulcer, localised heat and pain, increase in oedema, spreading redness of the soft tissues of the leg (cellulitis) and an increase in exudate and odour (Figure 6).

Venous ulcers can produce exudate, which is increased in the presence of infection. Exudate can decrease if appropriate



Figure 4. Varicose veins in the groin area.

compression therapy is introduced.

Generally, the wound edges are flat in venous leg ulcers, but if they are rolled and the granulation tissue looks unhealthy and non-healing, malignancy should be suspected and a biopsy undertaken.

How much pain is the patient experiencing?

Venous ulcers were once thought to be painless, however, many patients experience a lot of discomfort and for some the ulcer can be extremely painful. It is important to assess the level of pain so that the patient can tolerate the treatment and have an improved quality of life. Patients with venous disease also claim that they notice more discomfort if their legs have been in a dependent sitting or standing position for a long time.

Assessment of the lower leg

As part of the assessment the shape of the limb, the amount

of oedema present, the amount of movement in the ankle and the degree of general mobility should be noted. Limb shape changes with the degree of venous insufficiency, and when chronic disease is present the limb can look like an inverted champagne bottle. If the patient has decreased movement in the ankle, this affects the calf muscle pump's ability to move the blood from the leg back to the heart. Patients who sit with their legs down can develop dependant oedema and gravitational eczema as a result of poor venous return.

Assessment of the circulation

In all patients who present with lower leg ulceration, an assessment of the blood flow to this area is a key part of the initial assessment. If a patient has venous disease and subsequent leg ulceration, the mainstay of treatment is compression bandaging. However, this is contraindicated in arterial disease, which should be excluded before any compression therapy is started. First, the foot and lower leg

should be observed to determine the colour and temperature. Patients with venous disease generally have warm, well-perfused feet with palpable foot pulses.

A hand-held Doppler assessment should be undertaken where possible. This will not diagnose venous ulceration, but may be of value in defining a safe level of compression bandaging. A Doppler assessment involves measuring the amount of blood flow in the arteries to the lower leg and comparing the reading with the arterial flow in the arm. This is known as the ankle-brachial pressure index (ABPI) and is used in conjunction with a full clinical assessment.

Recommendations suggest that as a general rule an ABPI of 0.8 or greater permits the safe application of high compression bandages, while an ABPI of less than 0.8 suggests that there may be reduced arterial blood flow and therefore compression bandages may not be indicated. Reduced compression can be applied in



Figure 6. An infected venous ulcer.

patients with mixed aetiology ulcers or a slightly reduced arterial blood flow, however there must be accurate assessment of the vascular status through Duplex scanning or toe pressure monitoring beforehand (Vowden and Vowden, 2001; RCN, 2006).

All nurses should be trained in hand-held Doppler assessment and be able to analyse the results. There should be evidence of competency and many tissue viability nurses have written competency-based educational programmes to support accurate leg ulcer assessment. There is also good evidence to support this procedure as part of venous ulcer assessment (RCN, 2006).

In cases where the limb is too painful or placing a blood pressure cuff on the lower part of the leg is not practical, a Duplex scan (an ultrasound test) should be requested to exclude the presence of arterial disease.

In patients with non-healing venous ulcers, a venous Duplex scan may also be useful in determining the condition of the deep and superficial veins and whether or not the hypertension can be corrected with vascular surgery to the veins. The role of surgery in the secondary prevention of venous leg ulcers is not well established (Scottish Intercollegiate Guidelines Network [SIGN], 1998). One randomised controlled trial suggests that venous stripping reduces the recurrence of venous leg ulcers and should be offered over compression alone (Barwell et al, 2004). However, the role of surgery in the healing of venous ulcers requires more research.

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In the author's trust only those patients with non-healing venous ulcers who have had compression therapy and have no deep vein incompetence are recommended for superficial venous surgery (e.g. endovenous ablation, which uses lasers to burn the damaged vein), foam sclerotherapy (where 'foamed sclerosant drugs' are injected into a blood vessel), and stripping or ligation of the affected vein.

Other factors to consider

Another factor to consider as part of venous ulcer assessment, is the patient's nutritional status. In one study, Wipke-Tevis and Stotts (1998) uncovered moderate to high nutritional risk in 84% of patients who had at least one venous leg ulcer. This study also found that calorific and protein intake in 15 out of 20 patients was inadequate to enable the ulcers to heal (Wipke-Tevis and Stotts, 1998).

Psychosocial factors also need to be assessed. Elderly patients may be isolated with their only social interaction being with the healthcare professional who redresses their wounds. Assessment needs to include an understanding of how the leg ulcer affects the patient's quality of life and what support they already have or require. Clinical investigations such as blood tests can exclude other underlying conditions, e.g. anaemia and diabetes and can also detect protein malnutrition through serum albumin levels. Blood pressure and urinalysis also need to be recorded on initial assessment.

Conclusion

A thorough and accurate assessment of patients who present with leg ulceration is essential to

ensure that timely and appropriate treatment is started. Assessment should, be ongoing, as signs and symptoms can change and nurses need to monitor the impact of their interventions and evaluate progress. Good quality patient assessment can save time and costs through reducing inappropriate treatment regimens. **WE**

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Key points

- ▶▶ A thorough and accurate assessment of patients who present with leg ulceration is essential to ensure that timely and appropriate treatment is started.
- ▶▶ Assessment should be regular and ongoing.
- ▶▶ Signs and symptoms can change and nurses need to monitor the impact of their interventions and evaluate progress.
- ▶▶ Good quality patient assessment can save time and costs through reducing inappropriate treatment regimens.

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