

Training module

Leg ulcers

Epidemiology, diagnosis, local and systemic treatment

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Leg ulcers

Leg ulcers are the most common chronic wound encountered in community medicine settings and they represent a significant social and economic burden.

Their management demands a rigorous diagnostic and therapeutic process based on collaboration between various health professionals.

Today, a genuine therapeutic strategy makes it possible to shorten healing times by adapting treatment to the different phases in the course of a wound and the specific characteristics of patients.

1 | Causes and clinical signs of leg ulcers

Leg ulcers occur primarily among the elderly. In addition, it is estimated that around half of all ulcer sufferers treat the problem themselves, without calling on a health professional.

A leg ulcer is defined as a skin wound located below the knee that does not heal within a period of six weeks⁽¹⁾. The loss of substance - usually located on the lower third of the leg - concerns the epidermis, the dermis and, possibly, the hypodermis or subcutaneous tissue.

▶ A | A vascular origin in 95% of cases

▶ Ulcers have various causes and it is sometimes difficult to get the patient to specify the details: often a very small injury, scratch, eczema, or sudden development of an area of necrosis.

Sufferers usually have macro or microcirculatory problems causing ischaemia: venous insufficiency, peripheral arterial disease, diabetes. Arterial disease is present in 30 to 40% of patients. The pathophysiological mechanisms have been largely elucidated following the discovery of excessive MMP* enzyme activity in leg ulcers and other chronic wounds, abnormally prolonging the inflammatory phase of healing (see "Normal and pathological healing processes" module).

Non-vascular diseases and drugs can also be a cause of leg ulcers: a cancerous origin is possible for haemorrhagic ulcers occurring in photo-exposed areas in which the extension is slow.

ORIGIN OF LEG ULCERS⁽²⁾

Vascular causes (95%)	Non-vascular causes (5%)
Venous ulcer (70%) Arterial ulcer (20%) Mixed ulcer (10%) Necrotic angiodermatitis Ulcer of microcirculatory origin	Blood diseases Infectious causes Pyoderma gangrenosum Traumatic ulcer Ulcerated cancer

Leg ulcers

- **Venous ulcers** are the most common (57 to 82% of chronic leg wound sufferers⁽²⁾). Chronic venous insufficiency can be linked to excessive pressure in the superficial venous system and be accompanied by varicose veins, or can be caused by post-phlebotic syndrome. Venous ulcers are generally located close to the ankle bones and are usually oval-shaped with irregular edges.

- **Arterial ulcers** may lie over the ankle bones or be located on a pressure zone: heel, edges of foot. They occur in a context of atherosclerosis (claudication on effort, decubitus pain) with vascular risk factors (smoking, hypertension, dyslipidemia). Often small with sharp edges and painful, they progress downwards towards the subcutaneous tissue and osteo-articular structures. The impact of this type of ulcer on general condition is often very marked, with rapid loss of autonomy.

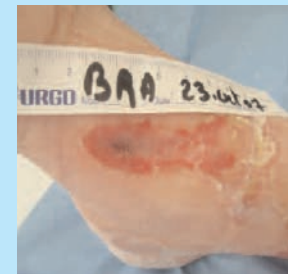
- **Mixed ulcers** combine venous involvement with an arterial component. They require an accurate diagnostic assessment (ABPI) in order to tailor their treatment and, in particular, the use of venous compression.

- **Necrotic angiodermatitis** is a very specific form: necrotic ulceration rapidly develops in the middle third of the lower leg, surrounded by a very painful, peripheral livedoid halo. It is due to obliteration of subcutaneous arterioles in the event of poorly controlled diabetes, arteriosclerosis or a hypertensive episode⁽³⁾.

- **Ulcers of various microcirculatory origins:** necrosis due to cholesterol embolisms having broken away from areas of atheromatous plaque during an endovascular procedure or anticoagulant treatment, ulceration accompanying certain immune diseases, such as lupus, polyarteritis nodosa, scleroderma, vasculitis, etc.



Venous ulcer of the medial malleolus



Arterial ulcer of the instep

► B | Impact on quality of life and complications of leg ulcers

► Irrespective of their origin, leg ulcers are incapacitating. The pain and difficulties involved in wearing shoes limit mobility and autonomy. The poor self-image patients develop as a result of a weeping, sometimes infected and foul-smelling wound, promotes anxiety and depression. Pain may disturb sleep. In reality, muscle retractions and abnormal joint positions may develop as a result of pain and complicate treatment: amyotrophy, ankylosis of the ankle, flexum of the knee or even the hip.

The most common complication of venous ulcers is contact eczema. As it progresses, an ulcer may be the site of infection that is initially local but may spread to become regional (cellulitis, erysipelas). It is rare for an ulcer to become cancerous (0.3% to 0.7%) and this usually involves longstanding venous ulcers.

Finally, leg ulcers may be the port of entry for tetanus infection in subjects who have not had booster vaccinations.

* Matrix metalloproteinases.

2 | Aetiological diagnosis of vascular leg ulcers

It is essential to recognise the origin of the ulcer and to evaluate the haemodynamic status underlying its development in order to determine the therapeutic strategy to be adopted.

This must also be adapted to the various phases in the wound healing course and the patient's characteristics.

➤ Venous, arterial or mixed ulcers:

In addition to clinical examination of the vascular networks of the lower limbs, assessment of the ankle-brachial index (ABPI) is the most reliable examination for the detection and early diagnosis of peripheral arterial disease (PAD) and for making an overall vascular prognosis. The ABPI is the ratio between the systolic arterial pressure at the ankle and the brachial systolic pressure, measured using a Doppler sensor.

The ABPI is used to look for any peripheral arterial disease responsible for the ulcer (arterial ulcer) or associated with a venous ulcer (venous ulcer with arterial component).

- A normal ABPI of between 0.9 and 1.3 excludes any arterial disease of the lower limbs: in the case of a venous ulcer, it is purely venous.

- An ABPI of below 0.9 signals the presence of PAD (reliability of over 90%). In the event of a venous ulcer, this will be described as mixed aetiology given the associated arterial component.

Evaluation of the severity of ischaemia is inversely proportional to the ABPI value: mild (between 0.7 and 0.9), moderate (between 0.4 and 0.7) and severe (below 0.4).

- An ABPI of over 1.3 is a sign of arterial incompressibility due to medial calcification (old age, diabetes), which is also a detrimental element.

- An ABPI of 0.4 formally contraindicates compression.

Measurement of the ABPI in leg ulcers is therefore of major value since it can confirm the absence of any arterial contribution (pure venous ulcer) or confirm the existence of arterial disease and help evaluate the severity of the ischaemia.

	CLINICAL CHARACTERISTICS OF VENOUS ULCERS	CLINICAL CHARACTERISTICS OF ARTERIAL ULCERS
<i>Location</i>	Lower leg, peri-malleolar	Foot, pressure zones
<i>Depth</i>	Superficial	Deep, tendons often visible
<i>Edges</i>	Unclear, irregular	Clear, regular
<i>Base</i>	Slough or granulation tissue	Dry, necrotic, atonic
<i>Clinical signs</i>	Exuding Pulse present	Painful Pulse absent
<i>ABPI</i>	ABPI > 0.9	ABPI < 0.9

Leg ulcers

2 | Aetiological diagnosis of vascular leg ulcers

- Consequently, measurement of ABPI makes it possible to adapt compression to the level required. It is recommended that venous ulcers with an ABPI of between 0.8 and 1.3 be treated with a strong level of compression (40 mmHg) to promote healing.
 - In the event of PAD associated with venous insufficiency (ABPI < 0.8 or ABPI > 1.3 due to arterial incompressibility), compression must be adjusted to below 30 mmHg at the ankle and strictly monitored.
 - In the event of an arterial ulcer caused by chronic permanent ischaemia, the priority should be given to surgical or endovascular revascularisation procedures in the absence of any response to medical treatment with an antiplatelet drug or, possibly, a vasodilator.
- The ulcer assessment must be performed under good light and several instruments must be available: tweezers to explore the ulcer, a washable or disposable graduated ruler to measure it and, if possible, a camera. The assessment makes it possible to describe:
 - the edges: torn, detached under the margins, gently sloping or steep, inflammatory or necrotic,
 - the size: measuring the largest two axes of the ulcer, perpendicular to one another,
 - the depth and detachments using a dilator or tweezers,
 - the wound bed, assessing the quality of granulation tissue, the amount of slough, the presence of necrosis, the possibility of infection,
 - the quality of the skin around the wound: eczema, blisters, erosions, purpuric pigmented dermatitis, peri-ulcerous lymphoedema, etc.

Regularly performed ulcer assessments make it possible to evaluate treatment and adapt the therapeutic strategy. This type of approach, shared with the patient, can help maintain the patient's motivation to continue the treatment.

3 | Management of leg ulcers

Management is hinged around two approaches: general measures designed to improve the patients' vascular context in order to counter ischaemia, and local ulcer care, which must be tailored to the problems of each particular wound.

▶ A | / Aetiological treatment

- Venous disease may require surgery to reduce excessive venous pressure or varicose vein sclerosis. **Venous compression** is a priority in almost all cases to improve venous return. In the event of lymphoedema, lymphatic drainage performed by a physiotherapist helps combat oedema.
The arterial and arteriolar component may require a surgical or endovascular procedure **to improve vascularisation** of the tissues. The use of negative pressure therapy (NPT) is subject to official recommendations.
On a systemic level, it is important to obtain a good nutritional and metabolic balance (diabetes), along with control of hypertension. The mobility of patients and their joints must be maintained and physiotherapy may be necessary.

Leg ulcers

3 | Management of leg ulcers

▶ B | / Local therapeutic strategy

The principle of a moist wound healing environment is essential in the case of leg ulcers.

▶ Preparing healing

Once the ulcer has been cleaned and necrotic debris removed, **the wound bed needs to be prepared** to optimise healing conditions:

- If the ulcer demonstrates signs of local infection due to excessive bacterial colonisation, a TLC-Silver antibacterial dressing will help control local inflammatory signs.
- If the wound is sloughy, desloughing is required until sufficient granulation tissue is obtained.
- However, in the event of an arterial ulcer linked with severe effects of arterial disease (ABPI <0.4) and not revascularised, it is preferable to dry out the wound (dry dressing, alginate changed before saturation) and not to perform desloughing.



Ulcer with signs of bacterial colonisation



Sloughy ulcer

▶ Promoting healing

Once any infection or slough formation has been controlled, the use of a **foam dressing** that maintains a moist environment helps control exudates and makes it possible to leave a longer interval between wound care procedures, which are often painful. When they can be used in adhesive form, these dressings also simplify wound care, avoiding the need for a secondary dressing, **but adhesive dressings should be used with care on leg ulcers due to the fragility of the skin around the ulcer.**

The use of a foam dressing with a healing accelerator helps reduce healing times by inhibiting excessive proteinase activity in leg ulcers. A multicentre, comparative, double-blind study conducted over an 8-week period demonstrated an acceleration (X 2) in healing speed compared to the same dressing without healing activator⁽⁴⁾. The wounds treated were venous leg ulcers and the patients wore effective compression in both groups.

After ulcer granulation, the **epithelialisation** phase must be protected using an interface that maintains a moist environment and ensures high-quality healing.

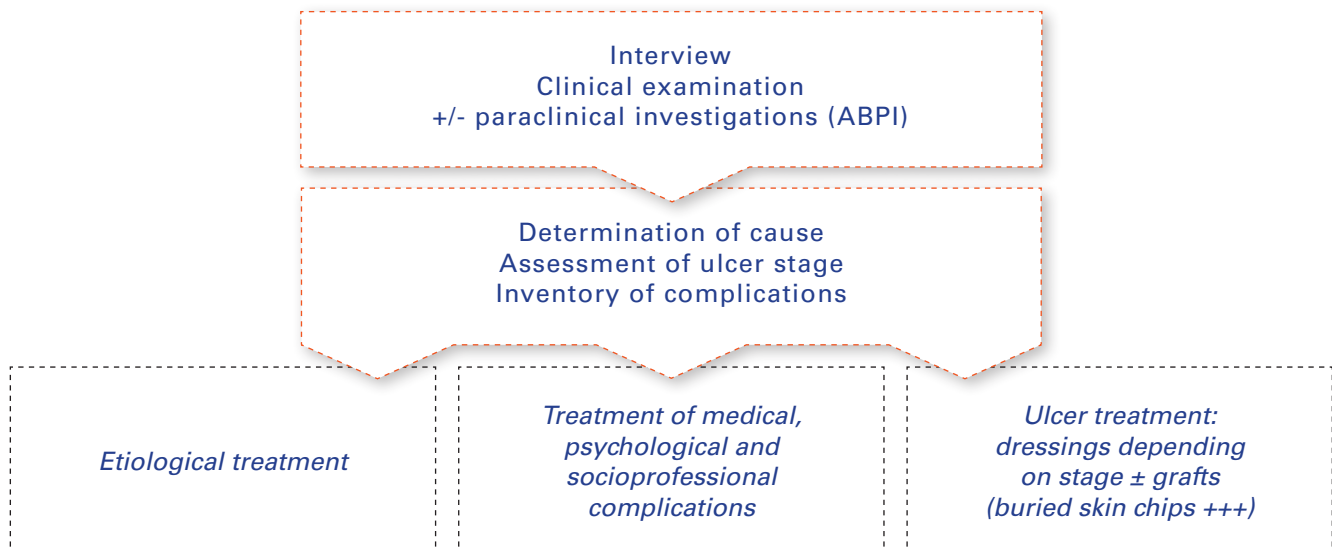
Preventing ulcer recurrences involves educating or re-educating patients:

- lifestyle advice to combat venous disease, overweight and sedentary,
- skin hygiene advice: drying properly after washing, pedicures to limit the risk of injuries in shoes, moisturising ulcer scars,
- rapid consultation of a doctor in the event of a traumatic or spontaneous wound affecting the lower limbs.

Leg ulcers

3 | Management of leg ulcers

MANAGEMENT OF LEG ULCERS⁽³⁾



➤ The main points to be remembered

- Leg ulcers are the most common chronic wounds and are usually vascular in origin. Their impact on patients' quality of life is significant, as is the risk of depression.
- The strategy for managing leg ulcers is based on customisation of treatment on the basis of the specific characteristics of the patient and the wound. Local treatment must be tailored to each phase in the course of the ulcer, starting by preparing the wound for the healing process by effective cleaning and desloughing.
- A better understanding of the pathophysiology of leg ulcers has opened up new treatment avenues and it is now possible to accelerate the healing of these wounds by neutralising the excessive activity of protease enzymes⁽⁵⁾.

➤ To find out more

- (1). Berqvist 1991 cited in «L'ulcère de jambe chez la personne âgée» - S Meaume. Ed John Libbey Paris 2002.
- (2). «L'ulcère de jambe chez la personne âgée» - S Meaume. Ed John Libbey Paris 2002.
- (3). O. Dereure. «Les ulcères de jambe» (Leg ulcers). SFFPC website – knowledge base.
- (4). Meaume S. *et al.* «A randomized, controlled, double-blind prospective trial with a lipido-colloid technology-nano-oligosaccharide factor wound dressing in the local management of venous leg ulcers.» *Wound Repair and Regeneration* 2012 (July/August);vol 20:500-511.
- (5). HAS. «Evaluation des pansements primaires et secondaires» (Assessment of primary and secondary dressings) Revision of generic descriptions for the list of reimbursable products and services. October 2007

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