Assessment, diagnosis and management of leg ulcers

Sarah Gardner, Clinical lead, Tissue viability service
Aim of the session

To develop a better understanding of the factors that contribute to the development of leg ulceration and how the application of proven treatments can improve clinical outcomes.
Why should we be interested in knowing about leg ulcer management?
Exposed tendon following incorrect diagnosis
Chronic ulceration due to inadequate leg ulcer management
Arterial or venous???
Bandage damage in the popliteal space
Skin condition or leg ulceration?
Stubborn ulcers over the malleoli...
Severe local infection... what do we do?
Today you will leave this training session and you will do things differently!
What is a leg ulcer?
Definition

A leg ulcer is a long-lasting (chronic) wound on your leg or foot that takes more than six weeks to heal.

A Venous leg ulcer is an open lesion between the knee and the ankle that remains unhealed for 4 weeks and occurs in the presence of venous disease.
(SIGN, 2010)
Epidemiology of leg ulcers

- **Point Prevalence**
  - 0.1%-0.2% per 1000
  - 4.5% per 1000 in older people (over 80)

- **Overall Prevalence**
  - 1%-2% of the population

- **Cost**
  - £300-£600 million a year (Simon et al 2004).
Causes

- Venous disease = 70%
- Arterial = 10-15%
- Mixed arterial & venous disease = 10%
A&P recap...Lower limb circulation

Arterial and Venous Circulation of the Legs

- Femoral Artery
- Popliteal Artery
- Anterior Tibial Artery
- Posterior Tibial Artery
- Peroneal Artery
- Dorsalis Pedis Artery
- Plantar Arch

- External Iliac Vein
- Femoral Vein
- Perforating Veins
- Great Saphenous Vein
- Small Saphenous Vein
- Anterior Tibial Vein
- Posterior Tibial Vein
- Dorsal Venous Arch
Arteries carry oxygenated blood to your legs and the veins carry de-oxygenated blood away from your legs. The blood returns to the lungs to pick up more oxygen and returns to the heart to be pumped out again through the arteries.
For blood to be effectively taken against gravity back to the heart, the body needs valves in the veins to prevent the backflow of blood.
Faulty valves

- When the deep system has faulty valves (the valves do not close tightly allowing the blood to leak back down) changes can start to occur within the legs which can result in leg ulceration. This is known as venous insufficiency.
ABNORMAL VENOUS FUNCTION -

Damaged valves are a predisposing factor not a cause for developing a leg ulcer
Venous disease/ ulceration
Progression of damage

- incompetent valves
  - venous stasis (pooling)
    - exacerbates high pressure
      - venous dilation
        - tissue flooding
          - intoxication and local Ischaemia
            - venous ulcer
Risk factors for venous disease/ulceration:

- Hereditary
- Age
- Female sex
- Obesity
- Pregnancy
- Prolonged standing
- Greater height
- Immobilisation
- PMH DVT
Arterial ulcers

- **Arterial insufficiency** refers to poor blood circulation to the lower leg and foot and is most often due to atherosclerosis.
PATHOLOGY

Increased oxygen demand

Progressive occlusion
Risk factors for arterial disease

- Smoking
- Diabetes
- Obesity
- High BP
- High cholesterol
- Increasing age
- Family history
Assessment

- Obtaining a diagnosis can only be achieved with a robust leg ulcer assessment.
- A leg ulcer assessment, including a doppler and/or lower limb assessment should be carried out within 1 - 2 weeks of the patient presenting.
- Doppler is only an ‘aid’ to diagnosis not the ‘be all and end all’… LOOK AT THE LIMB – WHAT DOES IT TELL YOU?
Assessing patients with leg ulceration

1 – Patient assessment (Extrinsic factors)
2 – Patient assessment (Intrinsic factors)
3 – Lower limb assessment
4 – Wound assessment
PATIENT FACTORS (extrinsic)

- socio-economic factors
- cultural and religious beliefs
- hygiene / environment
- mobility; activity levels
- lifestyle choices – smoking / drugs / alcohol
- major life stressors
- occupation

- treatments (appropriateness)
- isolation
- health beliefs / belief in treatment
- relationship with nurse
- concordance levels
- medicines, drug therapies
Medical history
(Intrinsic factors)

- Full medical history -
- Bloods
- Medication
- Weight
- BP
- Co-morbidities e.g. diabetes, rheumatoid arthritis – current status.
- Pain
Intrinsic - Clinical history indicators of possible venous involvement

- DVT
- Thrombophlebitis
- Leg, Pelvis or foot Fractures
- Varicose Veins
- Vein surgery or Sclerotherapy
- Obesity
- Multiple pregnancies
- H/O Pulmonary embolism
84 yr old diabetic, COPD, renal disease.
8 weeks after commencing insulin
Intrinsic - Clinical history indicators of possible arterial involvement

- Intermittent Claudication
- Ischemic rest pain
- CVA
- MI
- TIA
- Peripheral vascular disease
- Smoker
- Diabetes
- Heart disease or surgery
- Hypertension
- Renal Disease
Pain assessment & management
Pain Scale

(Taken from the Wong-Baker Faces Scale)
Abbey Pain scale

- For measurement of pain in people with dementia who cannot verbalise.
- Focusses on: vocalisation (whimpering, groaning, crying)
- Facial expression
- Changes in body language
- Behavioural change
- Physiological change (Temp, pulse or BP)
- Physical changes (Skin tears, pressure areas, contractures)
<table>
<thead>
<tr>
<th>Neuropathic Pain</th>
<th>Nociceptive Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>shooting</td>
<td>dull</td>
</tr>
<tr>
<td>burning</td>
<td>aching</td>
</tr>
<tr>
<td>tingling</td>
<td>tender</td>
</tr>
<tr>
<td>stabbing</td>
<td>cramping</td>
</tr>
<tr>
<td>piercing</td>
<td>sore</td>
</tr>
<tr>
<td>raw</td>
<td>twinge</td>
</tr>
<tr>
<td>pricking</td>
<td>hurt</td>
</tr>
<tr>
<td>throbbing</td>
<td>uncomfortable</td>
</tr>
<tr>
<td>Pins and needles</td>
<td>spasm</td>
</tr>
<tr>
<td>dagger like</td>
<td>nagging</td>
</tr>
<tr>
<td>sickly</td>
<td></td>
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</tbody>
</table>
Hyperalgesia and allodynia

- Patients can get Hyperalgesia (Excruciating pain in the wound bed)
- Allodynia (Pain in the surrounding skin)
- Pain can follow a ‘non-painful’ event such as wound exposure
- Usual forms of analgesia are often not effective
lower limb assessment

What do you need to look for to help diagnose the type of ulcer?
Hyperkeratosis

- Thickening of the stratum corneum (top layer of the skin) - frequently presenting as dry, crusty plaques.
Ankle Flare

- Fan-shaped pattern of small intradermal veins on the ankle or foot, thought to be a common early physical sign of advanced venous disease.
Atrophy blanche

- Localised, frequently round areas of white, shiny, atrophic skin surrounded by small dilated capillaries and sometimes areas of hyperpigmentation. Common in advanced disease.
**Lipodermatosclerosis**

- Localised chronic inflammatory and fibrotic condition affecting the skin and subcutaneous tissues of the lower leg, especially in malleolus region. Common in advanced disease.

- Results from capillary proliferation, fat necrosis, and fibrosis of the skin and subcutaneous tissues.
Oedema

- An abnormal accumulation of fluid beneath the skin. It is clinically shown as swelling.
Haemosiderin staining

- Reddish-brown discoloration affecting the ankle and lower leg. Common in advanced disease.
- Results from extravasation of blood and deposition of haemosiderin in the tissues due to longstanding venous hypertension.
Varicose eczema

- Also known as Venous dermatitis (or eczema).
- Is an itchy rash occurring on the lower legs arising when there is venous disease.
- It can arise as discrete patches or affect the leg all the way around. The affected skin is red and scaly, and may ooze, crust and crack. It is frequently itchy.
Varicose veins

- Dilated, palpable, subcutaneous veins greater than 3 mm in diameter.
<table>
<thead>
<tr>
<th></th>
<th>ARTERIAL ULCERS</th>
<th>VENOUS ULCERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Arterial disease</td>
<td>Chronic venous hypertension</td>
</tr>
<tr>
<td><strong>Wound bed appearance</strong></td>
<td>Deep</td>
<td>Shallow</td>
</tr>
<tr>
<td></td>
<td>‘Cliff edge’ margins</td>
<td>Irregular wound margins</td>
</tr>
<tr>
<td><strong>Evolution</strong></td>
<td>Rapid deterioration</td>
<td>Slow evolution</td>
</tr>
<tr>
<td><strong>Skin aspect</strong></td>
<td>Shiny</td>
<td>Pigmented</td>
</tr>
<tr>
<td></td>
<td>Pale</td>
<td>Eczema</td>
</tr>
<tr>
<td></td>
<td>Cold to touch</td>
<td>Warm to touch</td>
</tr>
<tr>
<td></td>
<td>Hair loss</td>
<td>Ankle flare</td>
</tr>
<tr>
<td><strong>Localization</strong></td>
<td>At the extremity: foot and lower limb</td>
<td>Lateral or medial malleolus</td>
</tr>
<tr>
<td><strong>Oedema</strong></td>
<td>May have a localised oedema</td>
<td>Generalized oedema</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Painful: Ischaemic pain</td>
<td>Painful if infected</td>
</tr>
<tr>
<td><strong>Doppler</strong></td>
<td>≤ 0.6</td>
<td>&gt; 0.8</td>
</tr>
</tbody>
</table>
Vascular assessment
Why is Doppler Assessment Necessary?

- All patients presenting with an ulcer or lower limb problems should be screened for arterial disease by Doppler measurement of ABPI.
- To enable effective treatment options to be established.
- To minimise the risk factors of compression therapy.
- To support holistic assessment.
## Interpretation of ABPI & establishing a diagnosis

<table>
<thead>
<tr>
<th>ABPI</th>
<th>Normal</th>
<th>Apply high compression therapy as per local guidelines (ABPI annually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 – 1.3</td>
<td>Normal</td>
<td>Apply high compression therapy as per local guidelines (ABPI annually)</td>
</tr>
<tr>
<td>0.8 – 1.0</td>
<td>Mild arterial disease</td>
<td>Apply high compression therapy as per local guidelines (Repeat ABPI every 12 months)</td>
</tr>
<tr>
<td>0.6 – 0.8</td>
<td>Significant arterial disease</td>
<td>If asymptomatic and healing then consider low compression and monitor. Repeat ABPI every 6 months. If symptomatic i.e. claudication pain, non healing ulcer routine referral to vascular team</td>
</tr>
<tr>
<td>&lt; 0.6</td>
<td>Severe arterial disease</td>
<td>Urgent referral to vascular team particularly if symptomatic. Repeat doppler every 3 months</td>
</tr>
<tr>
<td>&gt; 1.3</td>
<td>Medial wall calcification</td>
<td>Refer to tissue viability for management advice. May benefit from some reduced compression. Repeat doppler every 3 months</td>
</tr>
</tbody>
</table>
Wound assessment
Wound assessment

- Is it a reoccurrence?
- Duration
- Previous management regimes
- History of healing rates
- Wound area in cm² as a baseline (Is it bigger/ smaller and in what timescale)
- Tissue type (including hypergranulation)
- Wound edges
- Odour
- Type and level of exudate
- Peri wound skin status
- Photograph
- Following assessment… Identify risks to healing
Identifying wound bed infection

- Wound bed contamination
- Wound bed colonisation
- Local wound bed infection
- Systemic infection
- Use the AMBL tool
Wound measurement

Working out surface area in cm²
Leg ulcer management
Leg ulcer referral pathway

Assessment/re-assessment by trained practitioner (As per RCN guidelines, 2006)

- Patient history
- Physical examination
- Blood pressure
- Urinalysis/blood glucose
- Examination of the ulcer and surrounding skin
- ABPI
- Pain
- Mobility
- Nutritional status (Including MUST)

Diagnosis of aetiology

- *ABPI > 1.3 OR unable to Doppler (i.e. due to oedema)
  - Refer to tissue viability for advice
  - * Referral to vascular service will be required

Venous incompetence
- ABPI - 0.8 - 1.3
  - Manage with compression bandaging as per local Guidelines
  - HEALED

Mixed venous and arterial aetiology
- ABPI 0.6 - 0.8

Arterial insufficiency
- ABPI < 0.6

Other causes -
- Dermatology / Leg ulcer clinic
  - Uncertain diagnosis
  - Suspected malignancy
  - Pyoderma gangrenosum
  - Vasculitis
  - Contact dermatitis (Patch testing)
  - Referral from comm. Tissue viability

- Podiatry
  - Diabetic foot ulcer
  - Neuropathic ulcer

If non-healing or slow to heal (<40% reduction in size) after 6 weeks or recurring ulceration:
- Refer to tissue viability team who may then refer on to:
  - Leg ulcer clinic
  - Vascular service

If pain free refer to tissue viability for advice on management (may benefit from low compression
- Urgent referral to vascular service
- Routine referral to vascular service if experiencing classification pain, ulcer not healing or deteriorating

Tissue viability to link with leg ulcer clinic re ‘hard to heal’ wounds

Follow up to be in accordance with specialist advice

Ongoing support from community tissue viability team
Treatment should focus on:

- Wound bed preparation (TIME)
- Pain management
- Correct bandage selection and application
- % Progression at 6 week intervals
- Early referral to tissue viability
First - Washing and skin care

- Legs should be washed at each dressing change
- Emollient should be added to water
- NO aqueous
- Remove debris/ hyperkeratotic plaques
- Use a cloth/ flannel for large areas of hyperkeratosis (get pt to wash it properly in between use)
- Emollient therapy
Wound bed preparation – Debridement required?
Primary dressing –

Sorbion S Extra – primary dressing
If debridement needed...

- Standard – Urgoclean
- Complex – Topical antimicrobial
Locally Infected? Use Antimicrobial formulary to guide your clinical decision

Honey = 1\textsuperscript{st} line
Cadexomer iodine = 2\textsuperscript{nd} line

NOT INADINE
NOT SILVER

2 weeks
Managing the exudate

- How do you make a decision re amount?
- How do you choose absorbent pad?
- How do you choose how often to change the dressings?
- How does the padding affect the compression?
Compression

- Based on level of mobility
- K Two if immobile or limited mobility (Restricted to the house/getting to loo or kitchen)
- Actico (short stretch) if more mobile and getting out of house walking
- This applies to venous ulceration NOT chronic oedema/lymphoedema
Progression at 6 weeks

If the wound is progressing in a normal way then there should be a 40% reduction in wound size at 6 weeks. If this is not achieved RE ASSESS, consider possible reasons and refer to tissue viability for advice.

Consider:
Is the wound sloughy or infected?
Is the wound inflamed?
Is the compression on properly?
Has there been a change in Pts health?
Management plan should also include:

- Care plan for pain management
- Mobility/ exercises
- Lifestyle/ QoL
Gallop through compression ....
Bandaging - Compression therapy, the gold standard treatment for *venous* leg ulcers
Factors to be considered before applying compression

- **Skin condition** – delicate friable skin can be damaged by high levels of pressure
- **Shape of the limb** – the sub-bandage pressure and the pressure gradient will be altered by the limb shape in accordance with Laplace’s Law. Skin overlying exposed bony prominences may be subject to pressure damage
- **Presence of neuropathy** – the absence of a protective response increases the risk of sub-bandage pressure damage
- **Presence of cardiac failure** – rapid fluid shifts can be dangerous as it increases the preload of the heart
FUNCTIONS OF COMPRESSION THERAPY

- Reduces distension of the veins
- Increases the function of the calf muscle pump
- Restores valve function
- Increases the velocity of venous blood flow
- Reverses venous hypertension
- Reduces oedema
- Improves the microcirculation blood flow
- Reduces inflammation
- Improves symptoms of lipodermatosclerosis
Graduated compression is when the bandages are applied at the correct compression up the leg. The pressures fall as the circumference of the leg increases.

Providing the bandage is applied according to manufacturer instruction.
Bandages
Wool

- How should it be applied?
Compression bandage choices for Oxfordshire

- **Ko Flex (Low compression)** – 20mmHg

- **K Two (Multilayer)** – Will give a constant 40mmHg. Will be more effective in patients who have limited or no mobility.

- **Actico (Short stretch)** – Will deliver high working pressure and low resting pressure. More suitable for mobile patients.

ALL available on ONPOS
Applying compression

- Establish ABPI (Full compression needs an ABPI of 0.8 – 1.3)
- Gain consent & supply verbal/ written information.
- Assess shape of limb first (Photograph as baseline)
- Measure ankle circumference and document
- Apply dressings then shape limb to create a graduated shape.
- Remeasure ankle circumference and choose bandage size/ number based on type.
- Consider H&S issues – risk assess
- Offer advise post application – things to look out for.
CAUTIONS WITH FULL COMPRESSION

Heart failure

Arterial ulcers
Discontinue compression if patient has a systemic infection (Cellulitis)
Concordance

- Assess why patient is not concording
- Is pain managed effectively
- Is patient anxious or depressed? (HADS score)
- Do they need to be referred?
- Consider your skills/ your approach to the care
- Have you taken time to explain why they have leg ulceration and how compression works?
- Have you issued a patient information leaflet?
Managing complex ulcers

- Failure to progress
- Exudate management
- Pain
- Odour
- Infection
- Dealing with pts anxiety re the problem
- Feeling helpless – never ending!
- When to refer
- When do we ‘give up’?
- Palliative wounds
Thank you