CASE FIVE

Short case number: 3_27_5
Category: Cardiovascular
Discipline: Surgery
Setting: Hospital Ward
Topic: Lower Limb Ulcers_Chronic Venous Insufficiency

Case

You are the surgical intern; Sergio Ferraro is a 75 year old, resident of a local aged care facility. He has a long history of vascular problems. He developed an ulcer on his leg about 2 months ago, possibly following trauma, which is increasing in size in spite of medical treatment. He has been referred into the short stay ward via the aged care assessment team for surgical review.

Questions

1. In your assessment of Sergio, what are the key features of history and why?
2. What features of clinical examination will assist in differentiating an ulcer of venous or arterial aetiology.
3. Your examination reveals features of chronic venous insufficiency, what is the pathophysiology of chronic venous insufficiency.
4. What investigations would you undertake and why?
5. Outline the principles of medical management of venous ulcers.
6. What surgical measures can be implemented in the management of chronic venous disease and ulceration? What the indications for surgical intervention?

Suggested reading:

- Garden OJ, Bradbury AW, Forsythe JLR, Parks RW, editors. Davidson's Principles and Practice of Surgery. 6th edition. Philadelphia: Churchill Livingstone Elsevier; 2012.
- Henry MM, Thompson JN, editors. Clinical Surgery. 3rd edition. Edinburgh: Saunders; 2012.

ANSWERS

1. In your assessment of Sergio, what are the key features of history and why?

- present and previous episodes of ulceration
- previous thrombotic episodes
- previous venous and non-venous surgery to the leg, pelvis and abdomen
- arterial symptoms
- diabetes
- smoking history
- autoimmune disease
- other medical conditions
- locomotor problems
- current medications; and allergies.

2. What features of clinical examination will assist in differentiating an ulcer of venous or arterial aetiology.

Clinical features	**Arterial ulcer**	**Venous ulcer**
Gender	Men > women	Women > men
Age	Usually presents > 60 years	Typically develops at 40-60 years but patient may not present for medical attention until much older; multiple recurrences are the norm
Risk factors	Smoking, diabetes, hyperlipidaemia and hypertension	Previous DVT, thrombophilia, varicose veins
Past medical history	Most have a clear history of peripheral, coronary and cerebrovascular disease	More than 20% have a clear history of DVT; many more have a history suggestive of occult DVT, i.e. leg swelling after childbirth, hip/knee replacement or long bone fracture
Symptoms	Severe pain is present unless there is (diabetic) neuropathy; pain may be relieved by dependency	About a third have pain, but it is not usually severe and may be relieved on elevation
Site	Normal and abnormal (diabetics) pressure areas (malleoli, heel, metatarsal heads, 5th metatarsal base)	Medial (70%), lateral (20%) or both malleoli and gaiter area
Edge	Regular, 'punched-out', indolent	Irregular, with neo epithelium (whiter than mature skin)
Base	Deep, green (sloughy) or black (necrotic) with no granulation tissue; may involve tendon, bone and joint	Pink and granulating but may be covered in yellow-green slough
Surrounding skin	Features of severe limb ischaemia	Lipodermatosclerosis, varicose eczema, atrophe blanche
Veins	Empty, 'guttering' on elevation	Full, usually varicose
Swelling	Usually absent	Often present

3. Your examination reveals features of chronic venous insufficiency, what is the pathophysiology of chronic venous insufficiency.

Chronic venous insufficiency (CVI) may be defined as the presence of irreversible skin damage in the lower leg as a result of sustained ambulatory venous hypertension. This hypertension is due to failure of the mechanisms that normally lower venous pressure upon ambulation, namely:

- *Venous reflux due to valvular incompetence (90%).* This may affect the superficial veins, the deep veins or both, and may be due to primary valvular insufficiency (as in VV) or to post-thrombotic damage (see below).
- *Venous obstruction (10%).* This is usually post-thrombotic in nature.

4. What investigations would you undertake and why?

- Patients may require a full blood count, standard biochemistry, thyroid function tests, blood glucose determination, lipid profile and rheumatoid serology.
- Duplex ultrasound can be performed to define the nature and distribution of superficial and deep venous disease, as this has a bearing on both treatment and prognosis.
- In patients with absent pulses and/or a low ABPI, it can also provide valuable information about the pattern of arterial disease.

5. Outline the principles of medical management of venous ulcers.

<u>Medical therapy</u>

- Patients with leg ulcers often have multiple medical comorbidities, the treatment of which must be optimal if the chances of ulcer healing are to be maximized. There are no drugs that have been proved to increase ulcer healing or reduce recurrence. Most ulcers are colonized with bacteria rather than infected, and antibiotics are not usually indicated.
- Elevation of the leg(s) at rest is important

<u>Dressings</u>

There are many different types of dressing on the market but none has been proved to increase ulcer healing. Leg ulcer patients are notorious for developing contact sensitivity to all manner of substances present in ointments and dressings. Thus, the least expensive, simplest and blandest forms of dressing are to be recommended. Topical antibiotics should never be applied.

<u>Compression therapy</u>

Although it is still unclear exactly how compression therapy works, it continues to be the mainstay of treatment and, correctly applied, is highly effective in healing the majority of venous ulcers and preventing recurrence. To be maximally effective, compression should be:

- *elastic*, as this achieves the best and most durable pressure profile
- *multilayer*, as using many layers evens out the high- and low-pressure areas found under any bandage; the 'four-layer bandage' is a popular system
- *graduated*, with the pressure greatest at the ankle (*c*. 30-40 mmHg) and least at the knee (*c*. 15-20 mmHg).

It is vitally important to exclude arterial disease before compression is applied.

Even expertly applied graduated compression may fail to control severe oedema while the patient is still ambulant, and a period of bed rest for leg elevation may be required.

Elastic compression hosiery

Once the ulcer has been healed with compression bandaging, compression stockings will reduce the chance of recurrence and should be prescribed to all patients for life (assuming the arterial circulation is adequate).

6. What surgical measures can be implemented in the management of chronic venous disease and ulceration? What the indications for surgical intervention?

Surgical therapy

There are now data from a randomized controlled trial to show that, in patients with chronic venous ulceration due to superficial venous reflux, the addition of VV surgery to compression therapy reduces ulcer recurrence rates. Although the trial did not show that such surgery leads to a statistically significant increase in ulcer healing rates, most surgeons believe that it does and would offer it to this group of patients, provided they were surgically fit. The problem is that many of these patients are elderly with multiple comorbidities and are not fit for and/or do not want surgery. Furthermore, many of them have combined superficial and deep venous reflux and, in the presence of the latter, there is much less certainty that surgical eradication of the former is of any benefit, especially if the deep venous disease is post-thrombotic in aetiology.