

# Differential diagnosis of calf pain

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## Muscular pathology

Calf pain may be caused by traumatic tears of the gastrocnemius or soleus. The patient may report an audible pop or feeling like they have been kicked in the back of the leg when pushing off. On assessment, pain is reproduced with resisted testing, muscle lengthening and palpation.

## Neural pathology

Neural symptoms may be caused by lumbar radiculopathy, sciatic nerve irritation or peripheral neuropathy. Neural involvement presents as diffuse burning pain, night pain or paraesthesia. Lumbar spine referral can be identified by questioning the patient about the presence of back pain, previous history of back pain and the impact of lumbar spine aggravating factors on calf symptoms. To identify the presence of neural involvement routine assessment of calf pain should include lumbar spine range of movement, straight leg raise and slump. Reduced mobility of the neural structures can affect muscle function and may lead to reduced calf capacity.

## Vascular pathology

### **Popliteal artery entrapment**

Vascular causes of calf pain are often missed as they are less common and difficult to identify. Popliteal artery entrapment syndrome may present similarly to biomechanical overload syndrome. Symptoms such as tightness or cramping, which settles with rest, are common between these pathologies. The aggravating factors are also similar, however popliteal artery entrapment will be aggravated by cycling, swimming or walking

uphill. In contrast, biomechanical overload syndrome is typically only aggravated by running. Resisted plantarflexion can also reproduce symptoms, as the blood flow is occluded by the medial gastrocnemius. Distal pulses should be assessed before and after exercise, as pulses in patients with popliteal artery entrapment syndrome may be reduced post exercise.

Another useful tool for identifying patients with vascular pathology is the ankle-brachial pressure index (ABPI). This is the ratio of blood pressure at the ankle compared to the blood pressure in the upper arm. Lower blood pressure in the leg indicates reduced lower limb circulation. Onward referral for a specialist opinion is indicated if vascular pathology is suspected.

## **Deep vein thrombosis (DVT)**

DVT is another potential vascular cause of calf pain. Patients will present with a red, hot, firm, swollen calf. This may also be associated with venous distention or pitting oedema. Patients with a suspected DVT should be sent to an emergency medical centre, as it can develop into a life-threatening condition. The presence of symptoms in patients with known risk factors should raise the suspicion of DVT.

Risk factors for DVT include:

- Previous DVT
- Cancer
- Older age
- Obesity
- Male gender
- Heart failure
- Low grade injury to the vascular wall (vasculitis, chemotherapy)
- Immobilisation
- Trauma
- Hormone treatment (hormone replacement therapy)
- Pregnancy or postpartum period
- Dehydration

The Wells score combines the objective findings with the risk factors for DVT to determine the likelihood of DVT (Scarvelis and Wells. 2006). A score of 2 or higher suggests DVT is likely whereas a score of 1 or less suggests it is unlikely. This tool should be used to inform clinical reasoning and should not be used in isolation.

## Investigations

Investigations may be indicated in patients who do not improve as expected despite a comprehensive load management and rehabilitation program. Ultrasound imaging is useful to identify the presence of calf tears, whilst patients with vascular presentations may require an arteriogram or Doppler blood flow assessment. MRI may be useful to rule out bone stress injuries or neural involvement specifically at the lumbar spine. Nerve conduction studies may be used to assess for peripheral neural involvement.

## Articles associated with this episode:

[Alan Taylor – Forget models, mantras and gurus... Listen to the patient](#)

[Franklyn-Miller et al. \(2012\). Biomechanical overload syndrome: defining a new diagnosis.](#)

[Kerry et al. \(2005\). Mechanical calf pain in a 23-year-old male due to dynamic functional entrapment of the popliteal artery.](#)

[Scarvelis and Wells. \(2006\). Diagnosis and treatment of deep vein thrombosis](#)