



# Dealing with calf pain

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Common calf pain can frustrate patient and doctor alike, persisting for months if mismanaged. Although acute injuries are easily identified from the history, chronic injuries can be less easy to diagnose and the differential diagnosis widens.

## Acute calf strain

A specific incident, often associated with a tearing sensation and well localised pain, makes the diagnosis of a muscular injury straight forward. This usually involves the soleus and/or gastrocnemius muscles – medial head of gastrocnemius most often, followed by its musculotendinous junction.

Gastrocnemius muscle strain is usually caused by sudden acceleration from a stationary position or sudden dorsiflexion whilst running (as in running onto a kerb) – sudden stabbing or tearing in the medial head or at the musculotendinous junction is reported. Direct crushing during contact play may occur as an alternative mechanism.

Impairment is a guide to injury severity (see table).

## Calf strain grading

Grade	Symptoms	Signs	Average return to sport
I	Sharp pain (may continue)	Pain on unilateral calf raise or hop	10 – 12 days
II	Unable to continue	Active plantarflexion pain. Significant loss of dorsiflexion. Bilateral calf raise pain.	16 – 21 days
III	Immediate severe musculotendinous pain	Thompson's test positive. Defect palpable.	6 – 12 months

## Treatment

### Grade I and II injuries

- Reduce pain and swelling with the use of ice, TENS, interferential.
- Crutches if required
- 1cm heel raise (bilateral)
- 24 hrs post injury, introduce gentle stretching and muscle strengthening. Progression from calf raise bilateral then unilateral. Eccentric calf lowering over one step initially, progressing speed then adding weights.
- Low impact activities (e.g. cycling, swimming) as symptoms permit.
- When pain-free weight bearing, sustained myofascial tension is instituted.
- A graduated return to activity is important.

For Grade III injuries, surgery is usually indicated (see *Medical Forum* April 2004; copies available on request).

### Chronic calf strain

A previous acute injury may be reported, perhaps poorly treated. Or perhaps the problem is overuse.

Treatment by the physiotherapist consists of transverse friction and longitudinal gliding soft tissue therapy at the site of the muscular scar in conjunction with graduated exercises (knee extended and flexed).

Soleus muscle strain is relatively common sporting injury with a history of gradually increasing calf tightness over days or weeks. Interestingly, jogging or walking is usually more painful than sprinting. If the patient suffers from excessive subtalar pronation, the medial 1/3 of the soleus and the adjacent aponeurosis may become indurated and inflexible. Treated with a heel raise and lunge stretching, soft tissue physiotherapy, soleal muscle strengthening and perhaps foot orthotics to treat excessive pronation.

■ Strengthening exercise for gastrocnemius. Unilateral calf raise.

■ Strengthening for soleus. Calf raise with knee flexed.



■ Soft tissue therapy for chronic strain - sustained myofascial tension.



■ Strengthening exercises, gastrocnemius

## Other causes of calf pain

**Plantaris.** This vestigial muscle, absent in 10% of people, may rupture leading to tenderness, bruising and a moderate disability (similar disability and treatment to grade II gastrocnemius tear).

**Vascular claudication.** The middle aged or veteran athlete mostly. Suspect if pain is associated with a specific walking distance and relieved after a predictable rest period. Typically, pain is felt in the thigh or calf. With progression, pulses become harder to illicit and the exercise distance decreases. The stenosis is treated by balloon dilatation, endarterectomy or bypass graft. Confirmed by Doppler examination (ankle/brachial ankle pressure). Spinal claudication can present similarly.

**Popliteal artery syndrome.** Due to entrapment of the popliteal artery by a variant of the medial head of gastrocnemius. Pain is directly proportional to the exercise effort, with rapid relief of symptoms on resting. Exercise on a daily basis does not alter the severity of the pain, or when it occurs. Pain is often more severe on walking than when running (c.f. compartment syndrome in which pain resolves approximately 30 minutes after cessation of exercise with the severity of pain exacerbated by daily exercise and worse on running). 10% present with associated ischemia e.g. paraesthesia, colour and temperature changes of the toes and foot, temperature changes, rest pain and tissue necrosis. Treated by exploration and division of the offending compressing structure.

**Endofibrosis.** Due to disease of the external iliac artery. Typically presents with thigh pain, sometimes calf pain. Interestingly, cyclists present with this problem – worse symptoms with intensive effort and rapidly relieved by rest. The cycling position appears to exacerbate the symptoms. It is most easily diagnosed clinically, immediately after exercise, by the presence of a bruit over the femoral artery and weak/absent peripheral pulses. Angiography is used to confirm the diagnosis. Treated by a vascular surgeon.

**Neurological.** Neurological irritation may be diagnosed by the “slump test” – when pain is relieved by extension of the cervical spine, nerve root impingement is likely. Associated low back pain is suggestive.

Nerve entrapments:

Nerve	Compression	Symptoms
Tibial Nerve	Bakers cyst; popliteal artery aneurysm; ganglion.	Weakness: ankle inversion; toe flexor. Paresthesia: sole of foot.
Sural Nerve	Boots; mass lesions; trauma.	Paresthesia: lateral foot and heel.

**Other causes.** DVT requires a high index of suspicion – Homan's sign, constant calf pain, localised tenderness, increased temperature and swelling (all potentially confused with muscle injury!). Doppler ultrasound if DVT requires exclusion. ■