

Chronic lower leg pain in active people

Dr Chris Milne is a well-known New Zealand expert in sports medicine who practises at the Wairua Medical Centre in Hamilton

As we encourage more of our patients to become active, it is no surprise that more of them will suffer activity related pain. Since most activities involve leg exercise, then leg pain is a common exercise related complaint. What follows is an attempt to sort through this common symptom.

Firstly, we must define the tissue that is primarily involved. This will lead to an anatomical diagnosis. Secondly, most of us are not ideally set up to be endurance athletes. Minor biochemical flaws (e.g. slightly flat feet) can be unmasked and amplified by an exercise programme.

Finally, a team approach to treatment involving the GP, physiotherapist, podiatrist and occasionally orthopaedic surgeon usually brings the best results. Sports physicians are able to provide useful advice and a second opinion where diagnostic doubt exists.

Periostitis

The vast majority of chronic exercise related leg pain arises from the origin of tibialis posterior on the medial tibial cortex. Pain is diffuse, gets gradually worse through a bout of exercise, and is related to traction

at the muscle origin causing localised haemorrhage and secondary inflammation – a periostitis. This is otherwise known as the medial tibial stress syndrome. Athletes will refer to it as shin splints but we clinicians should try to use an anatomical label.¹ First

aid treatment for periostitis involves measures to reduce the bleeding and pain. Ice packs (e.g. the well known bag of frozen peas) can be very helpful, as can ice massage after exercise. Bear in mind however that this is a mechanical pain and therefore it demands a mechanical solution. For most people this will involve extra support for the medial aspect of the longitudinal arch of both feet. On occasions, shoes with a padded arch support and anti-pronation features will be curative. More often however, a custom moulded orthotic or at least a formthotic with medial posting (e.g. a medial heel wedge) will be needed. In my experience, rigid orthotics are not needed for most athletes, and are often not as well tolerated as the semi-rigid type. I explain to patients that setting up an orthotic for an athlete is similar to setting up the suspension on a racing car (they like that analogy!) and may take several attempts to get it right. It is important to stress to patients that the feet need

A team approach to treatment involving the GP, physiotherapist, podiatrist and occasionally orthopaedic surgeon usually brings the best results.

support whenever they are under load, not just during training. Therefore most people are best advised to wear orthotics in their work and casual shoes as well as in their sporting footwear.

In some cases, athletes will describe their predominant pain as arising from the anterior border of the tibia. In this case, it is the tibialis anterior origin that is under traction stress. These athletes do well with a

Key points

- Athletes in heavy training frequently present with lower leg pain.
- Most lower leg pain is mechanical in origin, and requires mechanical treatment.
- Diffuse shin pain is probably due to periostitis.
- Focal bony pain could well represent a stress fracture.
- Severe muscle pain involving an entire compartment may be compartment syndrome.

progressive concentric then eccentric exercise programme to build up the power of their ankle dorsiflexors.

In addition to these measures, local anti-inflammatory gels, ultrasound and stretching can be of benefit. However, the cornerstone of treatment remains the correction of abnormal foot motion, usually excess pronation.

Do not ignore training aspects. Some athletes run the same course in the same direction on a daily basis. The camber of the road may contribute to asymmetrical traction forces through the lower leg muscles.

Stress fracture

Athletes who present with more severe and focal pain should be suspected of having a stress fracture until proven otherwise.² In the clinic, a variety of tests can be used to provoke the pain. If the athlete is unable to hop five times on the affected leg,

this is highly suggestive of a stress fracture. Focal tenderness of the tibia or fibula and pain on direct percussion may be useful clues. Stress fractures usually arise from multiple causes, but biomechanical abnormalities and training errors (especially a sudden increase in training load) are particularly potent contributors.³ In female athletes, stress fractures may be associated with eating disorders, amenorrhoea and low

bone density. These issues need detailed history taking and may require multi-disciplinary management.

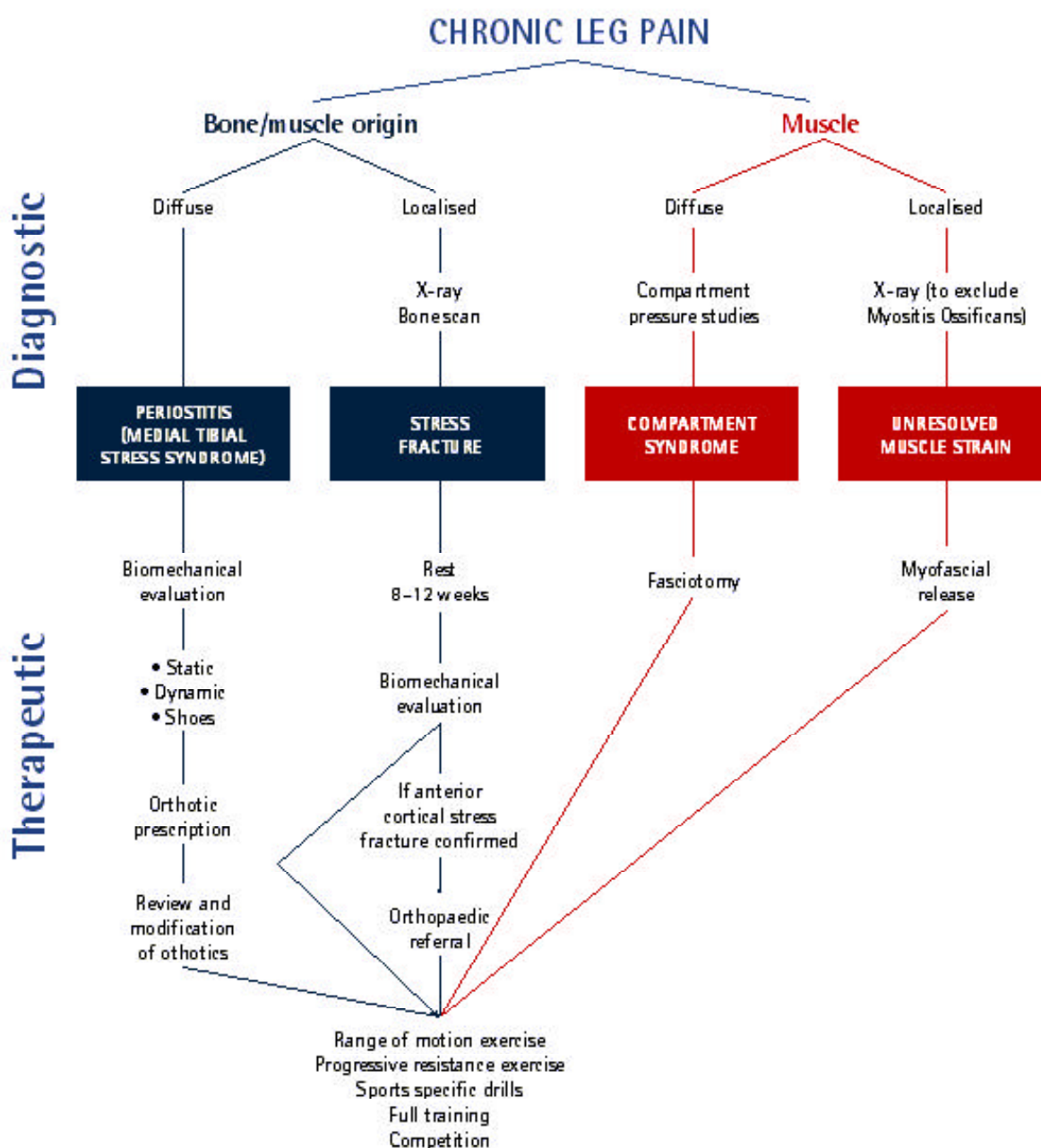
Investigations for stress fractures are constantly being refined. X-rays only become diagnostic late in the course of stress fracture (usually after at least three weeks of symptoms) and may remain normal throughout.

Isotope bone scans may show focal increased uptake (the hallmark of stress fracture) within days of symp-

toms developing. Fredericson and colleagues⁴ have shown a close correlation between the intense focal activity seen on bone scan and the anatomical bony breakdown seen on magnetic resonance imaging (MRI). Access to isotope bone scan or MRI may be arranged via a sports physician or orthopaedic surgeon.

Management of stress fractures requires rest from impact activity for 6–12 weeks depending on their se-

Figure 1. Diagnostic and treatment algorithm for chronic leg pain in the athlete



verity. During this time, the athlete can perform cross training activities e.g. swimming, cycling, pool running and stair climbing. Do not neglect flexibility – stretching of the gastrocnemius is useful, along with strengthening of the tibialis anterior muscles. In selected patients with more severe stress fractures, a pneumatic brace or even a cast may be indicated. However, the vast majority of athletes with stress fractures can go about their normal occupation provided they stop impact exercise. Female athletes with stress fractures should be prescribed 1 000 mg of calcium per day and those with amenorrhoea should have bone density monitoring. Depending on age group, estrogen replacement via the combined oral contraceptive pill or hormone replacement therapy should be considered.

Compartment syndrome

Diffuse severe muscle pain throughout an entire muscle compartment should prompt the clinician to think of compartment syndrome. This pain typically comes on 5–10 minutes after beginning a bout of exercise, and rapidly builds to such a severity that the athlete has to stop exercising. Pain usually settles rapidly on stopping exercise. The severity of pain reflects the fact that it is caused by ischaemia of the involved muscle compartment. Examination may reveal a tense muscle, especially within hours of exer-

cise. Further management depends on exactly which compartment is involved. The anterior, lateral and superficial posterior compartments are all easily accessible surgically, and if the clinical picture is sufficiently convincing, a good case can be made for direct referral for consideration of surgery. If symptoms suggest involvement of the deep posterior compartment, then referral for compartment pressure testing is mandatory. This is because the deep posterior compartment is difficult to access without disturbing overlying tissue, which in itself creates some morbidity.

Compartment pressure is recorded on a slit catheter inserted in the involved compartment. If the pressure is elevated (over 10 mm of mercury) particularly post exercise, this is regarded as a positive test. Surgery involves release of the compartment affected.

Unresolved muscle strain

Focal muscle pain, particularly following a previous injury, should make one think of an unresolved muscle strain. This classically occurs at the musculotendinous junction of the medial head of gastrocnemius.⁵ It is common in middle-aged athletes in racquet sports and is often called 'tennis leg'. On examination, local tenderness over the medial head of gastrocnemius (or whichever muscle is involved) is characteristic. There may be a palpable lump or thicken-

ing. Treatment involves deep tissue massage, termed myofascial release, to break down scar tissue. A temporary medial heel wedge is helpful.

Mixed pathology

If you see patients who don't fit easily into the above diagnostic categories, don't despair. Mixed features of two or even three pathologies may occur. In this case, proceed by correcting abnormal biomechanics with a temporary orthosis along with relative rest and see what symptoms remain.

Other causes

A variety of other problems can present as chronic lower leg pain in athletes. These include:

1. referred pain arising from the low back
2. nerve entrapment e.g. of the superficial peroneal nerve as it winds around the head of the fibula
3. popliteal artery entrapment
4. peripheral vascular disease
5. bony malignancy – primary or secondary
6. reflex sympathetic dystrophy (RSD).

These less common causes are beyond the scope of this article, and onward referral is suggested if any one of them is suspected. The accompanying algorithm provides a useful summary of the approach to chronic lower leg pain.

References

1. Milne CJ. An end to shin splints. *NZJ Sports Medicine* 1996; 24:32.
2. Meyer SA, Saltzman CL, Albright JP. Stress fractures of the foot and leg. *Clinics in Sports Medicine* 1993; 12:395–413.
3. Brukner P, Bennell K, Matheson G. Stress fractures. Melbourne: Blackwell Science, 1999.
4. Fredericson M, Bergman AG, Hoffman KL, Dillingham MS. Tibial stress reaction in runners. *Am J Sports Medicine* 1995; 23:472–481.
5. Locke S. Exercise related chronic lower leg pain. *Aust Fam Physician* 1999; 28:569–573.