

Hands On

Practical advice on management of rheumatic disease



PLANTAR FASCIITIS AND HEEL PAIN

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Introduction

Painful feet are common. Bunions, corns, metatarsalgia and osteoarthritis abound, and are usually obvious. Pain behind the heel is usually due to Achilles tendinitis and inflammation of the various bursae. This article focuses on those conditions resulting in pain *below* the heel, of which the commonest by far is plantar fasciitis. Despite it being fairly common in general practice, there is surprisingly little quality evidence for any of the common treatments. What trials do exist generally have very small numbers, making it difficult to produce authoritative recommendations.

Mechanism

- Repeated tensile and compressional stresses on the arched foot
- Fascial anatomy focusing stress into narrow band of fibrocartilage
- Cycles of tearing and healing
- Release of chemical mediators of inflammation, producing pain
- Eventually, myxoid degeneration and weakening of the fascia
- A pronated, flat foot and rarely a spontaneous rupture
- Painful scar tissue and calcification (spur formation).

Risk factors

It will come as no surprise that being over 40 and overweight are the main risk factors:

- Overweight
- Middle-aged
- Sedentary lifestyle
- Reduced ankle dorsiflexion¹
- Hard surfaces
- Flat shoes
- Human leucocyte antigen (HLA) B27 associated spondyloarthropathies.

This last association includes psoriatic and reactive arthritis and is commonly accompanied by bilateral plantar fasciitis, which confers a poorer prognosis for resolution.

Evidence of an occupational link is sparse, and plantar fasciitis is not recognised as a work-related or industrial injury.

Presentation

- **Pain** May be poorly localised, and may be felt below the heel, hindfoot, or in the ankle. If the pain radiates to the forefoot or leg, consider an S1/S2 lesion. It is worst first thing in the morning, on putting the foot to the floor, and after a period of rest. It is usually relieved by movement. The pain is typically 'tearing' in character. Passive *dorsiflexion of the toes and ankle* will reproduce pain by stretching the fascia.
- **Tenderness** Maximal at the origin of the fascia, which lies medially, just anterior to the calcaneal prominence. Pressure on this point reproduces the pain, which may then radiate anteriorly along the fascia, even on the lateral side.
- There is usually **little or no swelling**.

Differential diagnosis

Although most heel pain will be plantar fasciitis, it is important to consider the other possibilities, particularly if not responding to treatment.

- **Bruised heel syndrome**
Obese elderly, or younger athletes training on hard surfaces. Pain is felt more posteriorly, under the fat pad of the calcaneum. As the problem is biomechanical, treatment is very similar to plantar fasciitis, i.e. Sorbothane insoles with heel inserts.
- **Subcalcaneal bursitis**
Commoner in elderly with new shoes. Associated with a tender swelling under the calcaneum and is not aggra-

vated by dorsiflexing the toes. Aspiration and injection are likely to be effective treatment.

• **Tarsal tunnel syndrome**

Similar to carpal tunnel and usually overlooked. The posterior tibial nerve passes under the flexor retinaculum which runs between the medial malleolus and calcaneum. Pain, numbness and burning felt on medial side of foot, ankle or even calf, though usually poorly localised. Worse at night, and Tinel’s test positive (tap over nerve below and posterior to medial malleolus). Nerve conduction tests confirm. Can be associated with diabetes, hypothyroidism, inflammatory arthritis and pronated foot position. 15% will develop systemic disease. Steroid injection is treatment of choice along with correction of underlying problem.

• **Rarities**

The following are so rare as to hardly warrant a mention, but as some are potentially lethal please consider and refer if heel pain is not responding to usual treat-

ments after 3–6 months:

- **Fibrosarcoma, metastases, foreign body, Paget’s, osteomyelitis, tuberculosis**
- **Gout** can rarely present as otherwise typical plantar fasciitis.

Investigations

- **None usually necessary** as diagnosis is clinical.
- **X-ray unhelpful** other than to exclude other causes. Presence of spur is not diagnostic.
- **Plasma viscosity, C-reactive protein (CRP) and HLA-B27** may be useful if bilateral, and other enthesopathy or arthropathy present.
- **Nerve conduction tests** if clinical suspicion of tarsal tunnel syndrome, but not enough confidence to inject.
- **Ultrasound, magnetic resonance imaging (MRI) and bone scan** via secondary care, if not responding after 3 months’ treatment. (This is a fairly arbitrary figure from the USA).

Treatment

TREATMENT ALGORITHM based on severity of symptoms and order to try
<p>Mild (all easy to achieve in primary care)</p> <ul style="list-style-type: none"> • Education • Insoles • Passive stretching exercises • Ice and heat • Cross-frictional massage • Non-steroidal anti-inflammatory steroids (NSAIDs)
<p>Moderate (may need referral, depending on local resources/expertise)</p> <ul style="list-style-type: none"> • All the above measures • Physiotherapy • Steroid/local anaesthetic injection • Rigid night splint • Removable walking brace
<p>Severe/failure to respond (referral to secondary care recommended)</p> <ul style="list-style-type: none"> • Reassess diagnosis – REFER • Surgery?

- **Night splints** to immobilise and stretch fascia. Worn for several weeks. Rarely required.
- **Walking brace** for prolonged immobilisation in resistant cases. Rarely required.

• **Physiotherapy** (*first two need no referral*)

- **Stretching exercises** for plantar fascia and Achilles tendon (see ‘Information and Exercise Sheet’)
- **Cross-frictional massage** e.g. rolling heel over golf ball
- **Ultrasound** One RCT⁷ found therapeutic ultrasound was no more effective than placebo.
- **Extracorporeal shock wave therapy (ESWT)** Although earlier studies (mostly cohort studies, one RCT⁸) suggested ESWT is effective, two recent, good quality RCTs⁹⁻¹⁰ found that ESWT has no beneficial effect.
- **Lasers** One RCT¹¹ found laser to have no benefit.
- **Iontophoresis** with dexamethasone (one RCT¹²) has an immediate but not long-term effect.

• **NSAIDs**

As pain is predominantly due to chemically mediated inflammatory response in richly enervated tissue, use of these agents is both logical and effective for symptom relief, though do not treat cause. Observe usual cautions and contraindications.

• **Steroid/local anaesthetic injection**

- Approach tender spot from thinner skin of medial foot and direct posterolaterally. I use mixture of 0.5 ml (20 mg) Kenalog and 0.5 ml 1% lignocaine, ‘peppered’ (rather than bolus) as near to the bony insertion as possible. Do not inject into the fascia itself.
- There is a small but recognised risk of fascial rupture after injection (also after surgery), and a tiny risk of infection. Patient needs to rest for 24 hours after procedure.

Comments on treatments

• **Education**

Reduce stress on foot by reducing weight, and avoiding high impact activity on hard surfaces. Self-limiting condition in majority of cases.

• **Orthotics**

- **Insoles** combining visco-elastic heel cushion to both raise the heel and absorb the shock of heel strike, with longitudinal arch support. May also need heel wedge to correct calcaneo valgus tilt (pronation). RCTs²⁻⁶ are generally of poor quality, providing conflicting evidence.

- There is weak evidence for short-term benefit, but no evidence of long-term benefit. Counsel patient accordingly and obtain informed consent. May need to be repeated: suggested maximum of 3 injections within 6 months.
- **Surgery**
‘Open’ or endoscopic plantar fascia release. No good evidence of effectiveness, and complications include increased pain, nerve injury, fascial rupture and infection. May need to consider in resistant cases after trying night splints and a walking brace.

Comments on evidence base

The fact that so many treatments exist suggests that there is no singularly accepted favourite, and each doctor, physio-therapist and surgeon may be convinced that their method is the most effective. There is very little evidence to support any particular treatment, with only a handful of small randomised controlled trials (RCTs) providing weak and conflicting evidence. It is important to remember that lack of evidence does not equate with ineffectiveness – it’s just that we don’t yet know what works best.



Figure 1. Injection site for plantar fasciitis

Share decision to inject only after careful counselling, as procedure is painful and there is no evidence for long-term benefit.

Prognosis

- **The majority of cases will resolve with conservative treatment within 3–6 months.**
- **Bilateral and HLA-B27 associated arthritis cases have worst prognosis.**
- **Fascial collapse and over-pronation with pes planus are complications.**

KEY PRACTICE POINTS

- **Common condition**
- **Diagnosis is clinical**
- **Investigations usually unnecessary**
- **Many treatments – not much evidence**
- **The majority of cases resolve in 3–6 months**
- **Reassess/refer non-responders after 3–6 months**
- **Surgery unproven/very much a last resort**

Further reading

- Atkins D, Crawford F, Edwards J, Lambert M. A systemic review of treatments for the painful heel. *Rheumatology (Oxford)* 1999;38:968-73.
- Crawford F, Atkins D, Young P, Edwards J. Steroid injection for heel pain: evidence of short-term effectiveness. A randomized controlled trial. *Rheumatology (Oxford)* 1999;38:974-7.
- Gill LH. Plantar fasciitis: diagnosis and conservative management. *J Am Acad Orthop Surg* 1997;5:109-17.
- Hurwitz SR. Plantar fasciitis. *emedicine* May 2002 (<http://www.emedicine.com/orthoped/topic542.htm>).

References

1. Riddle DL, Pulisic M, Pidcoe P, Johnson RE. Risk factors for plantar fasciitis: a matched case-control study. *J Bone Joint Surg Am* 2003; 85-A:872-7.
2. Turlik MA, Donatelli TJ, Veremis MG. A comparison of shoe inserts in relieving mechanical heel pain. *Foot* 1999;9:84-7.
3. Lynch DM, Goforth WP, Martin JE, Odom RD, Preece CK, Kotter MW. Conservative treatment of plantar fasciitis: a prospective study. *J Am Podiatr Med Assoc* 1998;88:375-80.
4. Pfeffer G, Bacchetti P, Deland J, Lewis A, Anderson R, Davis W et al. Comparison of custom and prefabricated orthoses in the initial treatment of proximal plantar fasciitis. *Foot Ankle Int* 1999;20:214-21.
5. Caselli MA, Clark N, Lazarus S, Velez Z, Venegas L. Evaluation of magnetic foil and PPT insoles in the treatment of heel pain. *J Am Podiatr Med Assoc* 1997;87:11-16.
6. Martin JE, Hosch JC, Goforth WP, Murff RT, Lynch DM, Odom RD. Mechanical treatment of plantar fasciitis: a prospective study. *J Am Podiatr Med Assoc* 2001;91:55-62.
7. Crawford F, Snaith M. How effective is therapeutic ultrasound in the treatment of heel pain? *Ann Rheum Dis* 1996;55:265-7.
8. Ogden JA, Alvarez R, Levitt R, Cross GL, Marlow M. Shock wave therapy for chronic proximal plantar fasciitis. *Clin Orthop* 2001;387:47-59.
9. Buchbinder R, Ptasznik R, Gordon J, Buchanan J, Prabaharan V, Forbes A. Ultrasound-guided extracorporeal shock wave therapy for plantar fasciitis: a randomized controlled trial. *JAMA* 2002;288:1364-72.
10. Haake M, Buch M, Schoellner C, Goebel F, Vogel M, Mueller I et al. Extracorporeal shock wave therapy for plantar fasciitis: randomised controlled multicentre trial. *BMJ* 2003;327:75-80.
11. Basford JR, Malanga GA, Krause DA, Harmsen WS. A randomized controlled evaluation of low-intensity laser therapy: plantar fasciitis. *Arch Phys Med Rehabil* 1998;79:249-54.
12. Gudeman SD, Eisele SA, Heidt RS Jr, Colosimo AJ, Stroupe AL. Treatment of plantar fasciitis by iontophoresis of 0.4% dexamethasone: a randomized, double-blind, placebo-controlled study. *Am J Sports Med* 1997;25:312-6.

COMMENT

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Ross Duff rightly states that there is minimal evidence to support any one course of management for this biomechanical problem. Therefore management principles should be along the lines:

- **Keep it simple.**
- **Do least harm!**

As injections into this area are very painful a conservative approach is logical. The double blind trial by Crawford et al (1999) showed that steroid injections only produced a statistically significant reduction in heel pain at the 1-month outcome measure ($P = 0.02$).

The majority of primary care patients with plantar fasciitis have a pronated (flat) foot. Sports personnel are more likely to have a supinated foot and may have a spur, which may be relevant for professional athletes. In these patients the problem is often more chronic and the treatment more protracted.

Conservative management plan

- Supply Sorbothane arched insoles with a heel pad to be worn in flat shoes. These are listed in the Mobilis Healthcare Group catalogue as 'Spenco Cross/trainer insoles' – these are soft, arched insoles with a good heel pad. (Phone: 0161 678 0233; www.mobilishealthcare.com).
- Give patients a written explanation about plantar fasciitis and an exercise sheet with instructions for stretching exercises for both the plantar fascia and the Achilles tendon. A high percentage of patients also have a tight Achilles tendon.

I have used this conservative approach for 10 years and over the last 3 years I have seen approximately 10 cases per month. It appears to give excellent results and I rarely have to resort to giving a painful injection.

This issue of 'Hands On' and the accompanying 'Information and Exercise Sheet' can be downloaded as html or a PDF file from the Arthritis Research Campaign website (www.arc.org.uk/about_arth/rdr5.htm and follow the links).

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