

Plantar heel pain

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Terminology

Patients use the term plantar fasciitis however the term plantar heel pain (PHP) is recommended in clinical practice as it is unclear which structures are involved in the pathology. The terminology used by patients should only be corrected if they refer to the pathology as a heel spur as there is no direct correlation with heel pain. This may also influence compliance as patients often wonder how exercises can remove calcification and may start to think they need surgery to remove the bone spur.

Explaining the pathology

Explain to the patient that the area is irritated and as a result the plantar fascia has become thickened. Previously PHP was considered an inflammatory condition however it is now accepted it is a degenerative condition. Recent studies have suggested there may be some inflammation in the early stages of Achilles tendinopathy but there have been no studies involving the plantar fascia to date. As it is unclear what role inflammation plays in the pathology, try to limit the discussion about inflammation with the patient.

Patients will often ask why the plantar fascia has become irritated. This can be explained by showing them a weighing scale with load on one side and capacity on the other. Overuse injuries occur because there is an imbalance between the load and capacity of the tissues. This may occur because of an increase in load or a reduction in the tissue capacity.

An increase in load such as starting a new job with increased time standing is often easier to identify than a reduction in capacity. Some patients may report their load has not changed which may suggest there has been a reduction in tissue capacity. Tissue capacity can be influenced by psychological factors such as stress, increasing age, or changes in hormone levels.

Differential diagnosis

PHP is the most common diagnosis of pain in this area. PHP patients often report pain at the calcaneal insertion of the plantar fascia, however they may report pain that extends beyond the plantar heel. This may be due to an increased tendency towards widespread pain or by the pain being caused by a range of different sources. Differential diagnosis of pain in this region includes fat pad atrophy, neural entrapment or calcaneal stress fracture.

Patients with PHP will report pain on the first steps in the morning or after prolonged periods of non-weight bearing. Pain will improve as they continue to walk, and they will often walk off the pain.

Patients with fat pad atrophy will report worsening pain as they continue to walk. Older patients and females are at increased risk of fat pad atrophy. A fat pad contusion may also be considered in younger patients who report sudden onset heel pain after stepping down heavily. Fat pad involvement can be assessed through palpation and ultrasound to measure fat pad thickness.

Neuropathic heel pain is uncommon. Neural entrapment should be suspected in patients who report pain at rest or night pain, tingling or numbness in the foot. They may also report more diffuse pain that travels proximally up the ankle. They will often be tender on palpation of the tarsal tunnel or the area of entrapment, and symptoms may be reproduced with tapping on the tarsal tunnel.

Consider a calcaneal stress fracture in runner and other active patients who present with heel pain. Patients with a stress fracture will report rest pain, there may be swelling in the area and they will report pain on palpation of the calcaneus. Also consider that patients with Achilles tendinopathy may report pain extending into the arch of the foot.

Objective Assessment

The assessment process of PHP consists of palpation of the heel, tarsal tunnel tests if indicated from the history, and if the diagnosis is unclear, an ultrasound scan. Another useful test is the knee to wall test to assess for ankle range of movement. Limited ankle range of movement has been reported as a risk factor in patients with PHP so if present it needs to be addressed as part of the treatment programme. Clinical guidelines suggest using the windlass test. This test is performed by extending the ankle and toes as much as possible to see if it reproduces pain. This test has low sensitivity and is not routinely used in clinical practice.

When palpating the foot, position the patient prone and work systematically. Start at the insertion of the plantar fascia and work towards the toes. Also include the sides of the calcaneus and insertion of the Achilles in the palpation assessment. Some patients may present with PHP but do not have pain on palpation of the plantar fascia insertion. In these patients assess for tenderness on palpation distal to the insertion. If there is no pain on palpation throughout the plantar fascia, consider an alternative diagnosis.

Imaging

Ultrasound scans may inform diagnosis when a patient presents with diffuse symptoms and the diagnosis is unclear. Plantar fascia thickness is commonly 3.0-3.5mm in the absence of pathology, or up to 7mm with pathology. Ultrasound is a highly sensitivity test therefore if the plantar fascia is not thickened it is unlikely to be PHP.

Ultrasound imaging should be used with caution as patients often think the results will guide treatment and prognosis. Patients need to be educated that there is no association between symptoms and thickness of the plantar fascia and repeat scans are not required.

Prognosis

The prognosis of PHP can vary significantly from weeks to months. There is a lack of good quality data on the timescale for improvement in PHP as studies usually only include patients who have had symptoms for more than 3 months. Hansen et al. (2018) found that 50% of patients treated at a specialist sports clinic still report symptoms 10 years after starting treatment.

Better prognosis:

- Unilateral presentation
- Start treatment with < 7 months of symptoms
- Male
- > 41 years old

Poorer prognosis

- Bilateral presentation
- Female
- Start treatment with > 7/12 of symptoms
- < 41 years old

The clinician needs to ensure that the patient is aware that their symptoms will not resolve overnight. If the patient does not ask about prognosis, the clinician should initiate this conversation.

Treatment

The management of PHP should depend on the presentation of the patient. The management of a runner will be different from a patient with a sedentary job who is overweight. Tailoring the treatment programme to the patient is really important as there are lots of different treatments which have been found to be equally effective as each other.

Active patient

For patients who are active load management is key. This might include having discussions with their work to facilitate a reduction in time spent standing or reducing their current exercise levels. When talking about load management it is important to give the patient clear guidance for how to progress.

A runner should keep running as long as it does not aggravate their pain more than 2/10 and their pain returns to their normal level by the next day. If they are unable to tolerate running, start with walking and progress to jogging. Advise them to run on a flat soft surface such as sand or woodland.

Sedentary patient

Try to use active approaches specifically exercise in sedentary patients to increase capacity. If the patient is struggling to exercise and does not seem interested in the loading programme, show them the stretching programme as an alternative. The type of exercise prescribed will depend on the patient and the gut feeling of the clinician.

If the patient is overweight, the clinician should work with the patient to address this. Weight loss is difficult as it does not happen quickly, but it can help reduce the load placed on the plantar fascia.

Plantar Fascia Stretching

To perform plantar fascia stretching place the foot on the opposite knee and extend the toes and ankle joint as much as possible. This should be maintained for 10 reps of 10 seconds and repeated 3 times per day (DiGiovanni et al., 2006). Plantar fascia stretching combined with calf stretching has been shown to superior than isolated plantar fascia stretching.

Strengthening

Riel et al (2018) investigated the effect of isometric exercise, isotonic exercise and walking on acute pain reduction. The study concluded that isometric exercise was no better than isotonic exercise or walking for immediate pain reduction in individuals with plantar fasciopathy. This study suggests that we should not prescribe isometric or isotonic exercises to reduce pain. However isometric exercises may have a role in long term rehabilitation by providing progression towards heavy slow resistance training. Heavy slow resistance training can be performed by placing a rolled-up towel under the toes to maximally extend them and increase the tensile load across the plantar fascia.

A study by Riel et al. (2019) compared 2 different types of exercise regimes for PHP. One group performed a standardised progressive protocol which consisted of fixed reps and sets. The other group performed the same exercise but used a self-dosed approach. This group were told to perform the exercise as heavy as possible for a minimum of 8 reps but perform as many sets as possible. After 12 weeks there was no difference between the groups suggesting there is no association between the number of sets and the level of improvement. The exercise dose varied greatly however the standardised group performed on average 4.5 sets per session whilst the self-dose group performed 5 sets per session.

Orthotics

Orthotics are commonly used for the management of PHP. The type of orthotics used should depend on the patient. Some patients prefer a soft silicon insole whilst others prefer firmer supportive insoles. It is not important if the patient is prescribed an off the shelf or customised orthotics as both have been shown to be better than placebo. In patellofemoral pain syndrome the best indicator that an orthotic will work is if the patient felt it was comfortable when they put it into their shoe. There is no evidence to suggest a specific type of insole is better in PHP so use what the patient feels is most comfortable.

Corticosteroid Injection

There is debate around the role of corticosteroid injections in the management of PHP. Clinicians are often worried about the risk of plantar fascia rupture. A Cochrane review published in 2017 looked at the effect of steroid injections PHP. The review concluded that there is low quality evidence that local steroid injections compared with placebo or no treatment may slightly reduce heel pain up to 1 month. They also reported that although rare, serious adverse events were under-reported, and a higher risk cannot be ruled out.

Corticosteroid provides a short-term pain reduction of 4-8 weeks. This may provide a window of opportunity following an injection to perform heavy slow resistance training to prolong the effect. A recent feasibility study looked at combining corticosteroid injection with heavy slow resistance training, 18 out of the 20 participants felt this was an acceptable approach. A 3-arm trial is now being performed with 180 participants. All groups will receive a silicon heel cup and advice on pathology and load management. The other 2 groups will perform heavy slow loading, with one of the exercise groups also receiving a steroid injection. This trial aims to answer if heavy slow resistance is better than standard advice and if exercise intervention is better following an injection.