

# Management of tendinopathies of the foot and ankle

Nicola Maffulli

Umile Giuseppe Longo

Stefano Petrillo

Vincenzo Denaro

## Abstract

Foot and ankle tendinopathies are a significant problem in orthopaedic practice. They represent a failed healing response. Such tendons show increased matrix remodelling, leading to a mechanically less stable tendon which is more susceptible to damage. Diagnosis is based on a careful history and detailed clinical examination and investigations. Initially treatment is by relative rest and modification of physical activity, use of rehabilitative exercises, evaluation and correction of intrinsic and extrinsic causes of injury. Surgical management is indicated if conservative management fails, in stage 3 tendinopathy or if tendon rupture occurs. Randomized controlled trials are awaited to clarify the best therapeutic options.

**Keywords** Achilles; diagnosis; flexor hallucis longus; foot and ankle; management; peroneal; posterior tibial; tendinopathy

## Introduction

Tendinopathy is frequently used to describe overuse tendon injuries in the absence of a pathological diagnosis, and is used to describe what is actually a spectrum of diagnoses including peritendinitis, tendinitis and tendinosis. They are overuse injuries and usually occur when the intensity, or duration of physical activity or athletic training changes in some way. They are not

**Nicola Maffulli MD MS PhD FRCS (Orth)** Centre for Sports and Exercise Medicine, Queen Mary University of London, Barts and The London School of Medicine and Dentistry, Mile End Hospital, 275 Bancroft Road, London E1 4DG, UK. Conflicts of interest: none declared.

**Umile Giuseppe Longo MD MS** Department of Orthopaedic and Trauma Surgery, Campus Bio-Medico University, Via Alvaro del Portillo, 200, 00128 Rome, Italy. Conflicts of interest: none declared.

**Stefano Petrillo MD** Department of Orthopaedic and Trauma Surgery, Campus Bio-Medico University, Via Alvaro del Portillo, 200, 00128 Rome, Italy. Conflicts of interest: none declared.

**Vincenzo Denaro MD** Department of Orthopaedic and Trauma Surgery, Campus Bio-Medico University, Via Alvaro del Portillo, 200, 00128 Rome, Italy. Conflicts of interest: none declared.

due to persistent inflammation; histological studies of surgical specimens from patients with established tendinopathy consistently show absent or minimal inflammation. The histologically descriptive term ‘tendinosis’ (a degenerative pathology with a lack of inflammatory change), ‘tendonitis’ or ‘tendinitis’ (implying an inflammatory process) should only be used after histo-pathological confirmation.<sup>1</sup>

A physiological response to tendon injury is characterized initially by inflammation (i.e., tendinitis) followed by accumulation and deposition of collagen matrix within the tendon and finally by remodelling (i.e. tendinosis). They generally show hyper-cellularity, a loss of the tightly bundled collagen fibre appearance, an increase in proteoglycan content and, commonly, neovascularization.<sup>2,3</sup> Microscopically it is possible to detect other important pathological changes in the tendon, such as a reduction in the number of neutrophils and macrophages, fibrin deposition and an increase in both collagen breakdown and synthesis. Thus inflammation plays a role only in the initiation but not in the progression and continuation of the disease process. However, an inadequate healing response due to poor blood supply or ongoing mechanical forces on the tendon, or both, may prevent resolution. The resulting tendon tissue consists of a disorganized matrix of hypercellular, hyper-vascular tissue that is painful, weak and unable to respond to functional needs (Figure 1).<sup>4</sup> Thus what may appear clinically as an acute tendinopathy is actually a well-advanced failure of a chronic healing response in which there is neither histological nor biochemical evidence of inflammation.

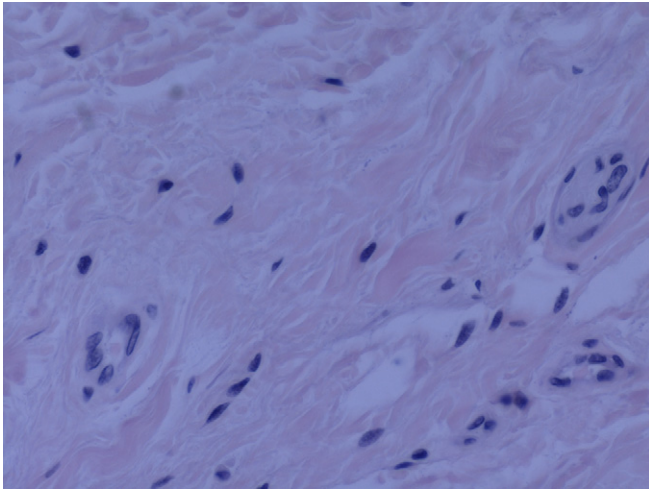
While several foot and ankle tendons can be affected, tendinopathy of Tibialis posterior, Achilles, Peroneal and Flexor hallucis longus tendons are the most commonly seen. This review aims to summarize the diagnosis and management of those tendinopathies.

## Diagnosis

The assessment of a patient with ankle tendinopathy starts with a careful history. Most commonly there is a recent history of trauma, a new sporting activity or an increase in the intensity of physical activity which preceded the onset of symptoms. The pain is commonly of an insidious onset and is localized to the area of the affected tendon. It worsens with sustained activity or on weight bearing. In the early stages of the disease, pain is not present at rest and decreases after a warm-up period. In the later stages, pain may be present at rest and worsens with any kind of activity. Pain in multiple tendons or joints can represent the manifestation of a rheumatologic pathology, and a joint effusion usually indicates an intra-articular inflammation rather than tendinopathy.

On examination the affected area should be carefully observed to note any asymmetry compared with the unaffected limb and the presence of any swelling, or muscle atrophy. Range of motion is frequently decreased on the affected side. Palpation may reveal tenderness along the affected tendon and always reproduces the patient's pain.

It is important to assess and ultimately treat any intrinsic and extrinsic causes of tendon injury. Important intrinsic factors include flexibility, laxity and strength of the tendon, leg length abnormality, patient age, and vascular supply. Extrinsic factors



**Figure 1** Histopathological features of tendon tissue harvested from a tendinopathic Achilles tendon showing a disorganized matrix of hypercellular, hyper-vascular tissue.

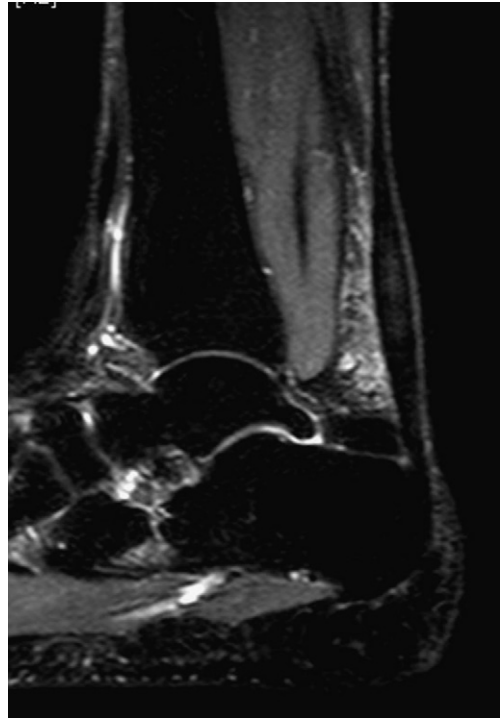
include overuse of the tendon, training errors, medication abuse, smoking and wearing an inappropriate type of shoe (i.e., motion control, cushioning, and stability) for the patient's foot type or other equipment not appropriate for the specific sport or work activity.

Plain radiography should be carried out to exclude bony abnormality and other pathologies. Radiographic findings are usually normal, but may demonstrate calcification of the tendon, osteoarthritis and even undiagnosed fractures. Ultrasonography can be useful to show areas of tendinosis and to demonstrate the dynamic response of the involved tendon. Further imaging is necessary if the diagnosis remains in doubt or if the patient does not respond to conservative treatment. Magnetic resonance imaging is the most useful investigation, especially useful if surgical intervention is being considered as it gives good images of tendon pathology and fatty infiltration (Figure 2).

### Treatment – general principles

As tendinopathy is not inflammatory with no overt inflammatory process, there is no rational basis for the use of non-steroidal anti-inflammatory drugs (NSAIDs) in its treatment. They are only useful to reduce inflammation and pain in the acute stage and while acetaminophen and NSAIDs provide short-term pain relief for patients with tendinopathy, they do not affect long-term outcomes. There is no evidence from randomized control trials that NSAIDs are more effective than acetaminophen which should be preferred for pain relief because it has fewer adverse effects. Several studies have demonstrated that NSAIDs do not reduce the time of recovery from tendon injury and may actually interfere with the healing process.<sup>5</sup>

Several treatment options have been proposed for the management of tendinopathy. Regrettably, not only have many therapeutic regimens not been subjected to randomized clinical trials, but it is not known whether a given treatment is applicable to all tendinopathies. That said, treatment is initially based on conservative measures, including relative rest, protection, ice, compression, elevation, medications, and rehabilitative exercise. It is also important to encourage patients to reduce their level of



**Figure 2** Magnetic resonance imaging showing tendinopathy of the main body of the Achilles tendon.

physical and sporting activity. The duration of relative rest is related to the severity of the injury, the pain and the patient's activity level. Quite early, this should be followed by a stretching and strengthening programme. Eccentric strength training promotes the formation of new collagen and has proved to be effective and is associated with excellent results in the management of Achilles (Figure 3 a–f) and patellar tendinosis, and it may be also useful in other tendinopathies. Overall results suggest a trend for a positive effect of eccentric exercises, with no reported adverse effects.

Orthotics, such as inserts or a heel wedge, are sometimes used to reinforce, protect and help unload the tendon. Other physical therapy options have been used including ultrasound, iontophoresis (electric charge to drive medication into the tissues), and phonophoresis (use of ultrasound to enhance the delivery of topically applied drugs), but there is little evidence of their effectiveness.<sup>6</sup>

In the past decade, many new treatments have been introduced, and developed to manage tendinopathies. These include extra-corporeal shock wave therapy, radio-frequency ablation, percutaneous tenotomy, autologous blood or growth factor injection, prolotherapy, and topical nitrates.<sup>7–22</sup> The use of extra-corporeal shock wave therapy has been approved by the FDA for the treatment of lateral epicondylitis and plantar fasciitis and encouraging results have also been reported in the management of calcifying tendinopathy of the shoulder. Combining eccentric training and shock wave therapy produces higher success rates compared to eccentric loading alone or shock wave therapy alone. Sclerotherapy and the injection of growth factors may improve tendon healing especially in sport practice while the autologous blood injection may reduce pain. These new treatments are

Download English Version:

<https://daneshyari.com/en/article/10176299>

Download Persian Version:

<https://daneshyari.com/article/10176299>

[Daneshyari.com](https://daneshyari.com)