

Achilles Tendinopathy Management

Subjects: Orthopedics

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Achilles tendinopathy (AT) is a clinical condition characterized by persistent tendon pain and swelling related to mechanical loading of the Achilles tendon. AT, along with plantar fasciitis and stress fractures, are the injuries that most frequently involve the foot, furthermore AT is one of the most common tendinopathies of the lower limb .

Keywords: Achilles tendinopathy ; tendon ; eccentric training ; injections ; rehabilitation ; overview ; athletic injury ; manual therapy ; physical therapy ; conservative treatment ; physical exercise

1. Introduction

The incidence rate of AT is 1.85 per 1000 patients visiting general practitioners, rising up to 2.35 per 1000 in the population aged 21–60 years ^[1]. Among others, the population most exposed to develop AT are athletes, especially those who practice running and jumping sports. In fact, de Jonge et al. reported a relationship with sports activity in 35% of AT cases ^[1]. Moreover, a recent study by Janssen et al. ^[2] reported that among elite track and field athletes, 43% reported having symptoms of AT, with the highest prevalence of AT found in medium- and long-distance runners. Furthermore, the perception of stiffness in the calf muscles appears to be a risk factor associated with the development of AT ^[2]. However, AT also occurs in non-athletes population especially among middle-aged overweight patients who have not faced increased physical activity ^[3].

The identification of risk factors is still unclear. the study by Holmes et al. reported that individual patient characteristics such as age, male gender, and obesity have been shown to have positive correlation with AT ^[4]. On the contrary, the study by Longo et al. on a population of track and field athletes, found that although most of the studies conducted show a prevalence of male gender, does not seem to be a correlation between age, gender, weight, height, and impact profile in the development of AT ^[5]. Chronic AT is thought to be the result of repetitive overuse injuries, with a tenfold increase in Achilles tendon injuries in runners compared to age-matched controls ^{[6][7]}; however, even in patients without active participation in strenuous physical activity, AT often occurs ^[8].

Staff involved in the management of AT face a serious challenge. In fact, the results even after surgery are different and the surgery itself requires prolonged rehabilitation ^[9]. Moreover, symptoms can last between 3 to 12 months after starting treatment, in about 25% of patients chronic tendinopathy related symptoms can be present even after 10 years ^[10].

Given the high incidence of AT, the purpose of this work is to help the reader with an overview of the approach to the patient with AT, from diagnosis to the various therapeutic opportunities currently used and reported in the literature. We present an overview of the management, from diagnosis to treatment, of AT, with a specific focus on conservative management based on pivotal works retrieved from the following database: Pubmed, Google Scholar, PEDro, and Scopus.

2. Diagnosis

The diagnosis of AT is mainly based on the medical history and physical examination ^[11]. One of the initial symptoms of AT is morning stiffness or stiffness after inactivity, while pain is a late symptom ^[9]. Nevertheless, the type of pain is a key feature in identifying AT: initially the pain appears as a pain that may not be disabling, but with continued physical activity it can affect training skills. Pain usually decreases with rest but exacerbates with physical activity. Furthermore, according to Cook et al. ^[12] morning pain is a hallmark of AT and along with stiffness are considered good indicators of tendon health. A recent work by de Vos et al. ^[13] showed that experts generally agree in diagnosing AT when localized tendon pain, tendon thickening, and pain associated with weight-bearing activities are present. Additionally the presence of pain on palpation localized in the distal 2 cm of the Achilles tendon associated with swelling and redness of the area should lead to suspect AT ^[14].

Subjective self-reported pain with a localization of pain 2–6 cm above the insertion of the Achilles tendon to the calcaneum, and subjective reporting of morning stiffness with a pain that is usually worse in the morning, are subjective assessments that a clinician must consider when there is a suspicion of AT. Although Hutchison et al. [15] found that the tests, which demonstrated the highest validity, were “self-reported pain” and “pain on palpation”.

The severity of AT can be measured through the Victorian Institute of Sport Assessment-Achilles (VISA-A). VISA-A explores the domains of pain, function, and activity. The score of 100, obtained from the sum of the scores of the individual domains, corresponds to the value that a healthy person would obtain. The VISA-A questionnaire provides a valid, reliable and easy to use index to assess the severity of AT [16][17].

US is usually used to confirm the clinical diagnosis of AT through a visualization of tendon structure; however it has a poor ability to detect an early tendon damage and to monitor the progress of the pathology or healing. Furthermore, there seems to be a poor correlation between imaging and clinical symptoms [18]. Therefore, an innovative computerized imaging modality called “ultrasound tissue characterization” (UTC) was developed by van Schie et al. [19], UTC allows quantitatively assessing the tendon structure and to discriminate symptomatic from asymptomatic tendons [19][20].

3. Treatment

To date, eccentric loading exercise programs are considered the principal approach to AT [21], which was confirmed by recent studies that demonstrate a strong evidence in eccentric training exercises (**Figure 2**) [22][23]. In recent decades, the Alfredson's eccentric exercise protocol published in 1998 was long considered the best exercise protocol for AT conservative treatment. This program consists of two different eccentric exercises (3 × 15 repetitions 2 times daily, 7 days/week, for 12 weeks) asking the patient to perform heel drops on the injured ankle for loading eccentrically the plantar flexor muscle-tendon unit while using the healthy lower limb to return to the start position [24]. Sayana & Mafulli [25] showed that despite the large use of this protocol, 45% of individuals did not respond favorably to the protocol, thus questioning its wide popularity; for this reason Jonsson et al. [26] proposed a modified version of the Alfredson's protocol without loading into dorsiflexion to improve efficacy in patients with AT.

Currently there is still a lot of variability in ESWT treatment parameters in terms of energy level (expressed in mJ/mm²) which is determined by number of impulses per treatment session and pressure (expressed in bar), frequency of impulses, number of weekly sessions and number of total sessions. This makes it difficult to identify a standard way of treating AT with ESWT. A recent meta-analysis conducted by Fan et al. [27] found that medium energy ESWT (0.12–0.25 mJ/mm²) was comparable to low energy ESWT (0.06–0.11 mJ/mm²) in improving pain VAS scores; furthermore, they found that ESWT led to better VAS pain scores than other conservative treatments at both shorter (<6 months) and longer (>6 months) follow-up. However, a recent work, not included in the meta-analysis by Fan et al., compared the use of two different applicators, point-focused and the line-focused applicator, in the treatment of AT. The authors found significant VISA-A score improvement for all groups (including placebo group) during 24 weeks without a statistically significant outcome difference between groups [28].

If a benefit is not obtained after six months of conservative treatment (which can happen to 24–45.5% of patients with AT) [9][29], surgical treatment can be used. There are three main surgical options available: simple percutaneous tenotomy, minimally invasive stripping of the tendon and open procedures [30]. Worst results are expected in women after surgical treatment [31].

The decision about weight-bearing the operated side is based on the type of surgery and the degree of debridement performed during the surgery. Generally, as reported in the review by Lohrer et al. [32] after open procedures, weight-bearing is usually allowed after 2 weeks, and the use of a cast is recommended for over 6 weeks, while minimally invasive procedures allow a full weight-bearing after 1 to 2 weeks and the use of a cast is recommended for up to 6 weeks [9].

4. Conclusions

Clinical examination is a key element in the diagnosis of AT, the RLHT showed moderate clinical evidence in the diagnosis and assessment of early symptoms is crucial for early initiation of conservative treatments.

Eccentric exercise represents the gold standard conservative treatment for AT. Regardless of the chosen therapeutic exercise modality (eccentric, combined, HSRT) it is important to follow a progression of loads based on the evaluation and clinical history of the patient.

Frequency of rehabilitation sessions must take into account the response times of the collagen tissue to load.

Surgery should be considered only when conservative management has failed; in post-surgical rehabilitation, the granting of weight-bearing must be carefully considered based on the type of surgery.

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