

Achilles tendon treatment: Short review

Abstract

The achilles tendon is a structure formed by connective tissue that, due to overuse and overload, can develop acute or chronic tendinopathies or even complete rupture of the tendon. The treatment can be conservative with medication and physical therapy or in some cases surgical intervention with debridement or tendon reconstruction is necessary. In this short review, the evidence for the treatment of tendinopathies is presented.

Keywords: achilles tendon, tendinopathies, physical therapy, surgical

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Physiology and structure of tendons

Tendons are fibrous structures, formed by connective tissue, whose main function is to connect and transmit muscle strength to the bone structure, allowing body movement to occur. Predominantly formed by type I collagen, tendons can support large tensile loads and at the same time have a certain degree of elasticity. Thus, different extracellular matrix molecules, including collagens, elastin, proteoglycans and glycoproteins, are involved in tendon fibrillogenesis. However, due to the poor vascularization of the tendons, the inflammatory and repair process of this tissue is compromised, favoring chronic tendinopathies that are difficult to resolve. Like any other tissue, tendons can undergo adaptations in volume and size, depending on the stimulus or aggression generated in the tissue. Depending on the intensity, frequency and duration of the stimulus/aggression, the tendon can physiologically adapt to the process or evolve into a pathological condition that can range from acute/chronic tendinitis or calcification, to a complete rupture of the tendon.

Pathophysiology of tendons

Although the pathogenesis of tendinopathy is poorly understood and has been defined as a degenerative condition or a failure of the healing process, it is known that the process involves events of multifactorial origin, with intrinsic and extrinsic factors. Individual patient characteristics, such as increasing age, sex and obesity, showed a positive correlation with the pathophysiology of the tendons. Extrinsic factors such as the use of fluorokinolones and corticosteroids have also been shown to lead to tendon weakness, with associated tendinitis and an increased risk of rupture. Acute, chronic, or ruptured injuries can occur in any tendon due to macroinjuries with high-energy trauma or by microinjuries or overuse with low-energy and high-repetition trauma. Large tendons that have a high load demand, such as the achilles, patellar, rotator cuff and forearm extensors tendons, are usually the most affected. However, it is worth noting the existence of studies that demonstrate a degenerative process and tendon rupture in patients without a history of overload. The exact mechanism to explain these cases is uncertain and a possible hypothesis raised is related to the low vascularization of the tendon, which would cause tissue hypoxia, contributing to the degenerative process and subsequent rupture.

Achilles tendon pathophysiology

The achilles tendon is one of the most important and strongest tendons in the body. This tendon is formed by the union of the

gastrocnemius and soleus muscles with insertion into the calcaneal bone. The triceps sural muscle plays a role in the knee and ankle joint, participating in knee flexion and ankle plantar flexion movements with important role in gait and in other functions involving the ankle and foot. Although achilles tendon has some particularities and peculiarities, the pathophysiology of the achilles follows the same precepts as the other tendons in the body; being able to be acute or chronic, as well as affecting athletes and non-athletes (Figure 1).¹⁻³

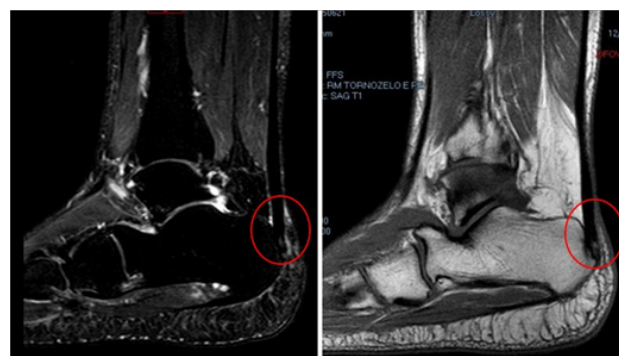


Figure 1 Illustration of achilles tendon tendinopathy. Thickening with longitudinal streaks of signal alteration due to tendinosis is observed in the insertion of the lateral half of the achilles tendon, associating a spur outline with mild medullary edema in the calcaneal tuberosity.

Treatment for chronic tendon injuries

Although there is controversy about the causes involved, chronic injuries are associated with overuse that usually result from low-energy and repetitive injuries. Given this situation, how to manage and what is the evidence for the treatment of chronic achilles tendonitis?

- The first line of option is conservative treatment with suspension of sports activities and rest in the initial phase for tendon reorganization;
- The use of orthotics is still controversial due to the secondary muscle weakness caused by immobilization;
- Pharmacological treatment is still used to reduce pain, however, there is still not enough evidence to support its use;
- The use of electrophotherapeutic resources (laser, ultrasound, electrotherapy, etc.) also lacks scientific evidence on the real benefits of the application;

- v. The management of tendinopathy with the application of eccentric exercises is supported by level I studies;
- vi. The application of extracorporeal shock waves has been growing as a form of intervention, with good results, with a moderate level of evidence in the literature;
- vii. The application of Platelet-Rich Plasma (PRP) does not suggest evidence to support its use, and further studies are needed in this field, with the standardization of PRP preparation methods;
- viii. When conservative treatment is unsuccessful (after six months of treatment), surgical procedure for debridement and removal of devitalized tissue should be considered.⁴⁻⁶

Treatment in acute injuries tendon

Acute injury with achilles tendon rupture is frequent with an incidence of 31 cases per 100,000 inhabitants per year, being more common in young, middle-aged males, aged between 37 and 44 years. How to manage and what is the evidence for conservative and surgical treatment?⁷

Two main options for conservative treatment are: immobilization for four weeks and functional support with early rehabilitation. Another option is surgical treatment with an open approach or a minimally invasive approach. Several randomized control clinical trials comparing conservative and surgical treatment have been carried out with conflicting results regarding superiority and complications. A recent systematic review demonstrated that surgical treatment of achilles tendon ruptures reduced the risk of re-rupture compared with conservative treatment. However, re-rupture rates were low and differences between treatment groups were small with a risk difference of 1.6%. Although the study demonstrated a lower incidence of rerupture in operated cases, the authors pointed out that surgical treatment resulted in a higher risk of complications, such as infections or thrombosis, when compared to non-operative treatment. In this sense, the decision on conservative or surgical treatment must be shared with the patient, taking into account the individual's physical conditions (athlete, amateur or sedentary) and the types of activities (sports or non-sports) performed by the patient, as well how, the risks and benefits of conservative and surgical treatment must be explained.^{8,9}

Conclusion

In conclusion, there is a consensus that the rehabilitation process must be present in both procedures, progressively and respecting the biological aspects of the tissue's inflammatory and repair process for the patient's adequate return to their activities.

Acknowledgments

None.

Conflicts of interest

The authors declare no conflicts of interest.

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