

# Tendinopathy

Subjects: Sport Sciences

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Using three different databases—PubMed, MEDLINE and CENTRAL—a literature search has been performed in May 2020 combining MeSH terms and free terms with Boolean operators. Authors independently selected studies, conducted quality assessment, and extracted results.

Ultrasound imaging has a good reliability in the differentiation between healthy and abnormal tendon tissue, while there are difficulties in the identification of tendinopathy stages.

Tendinopathy is a common disease that affects athletes, causing pain and dysfunction to the afflicted tendon. A clinical diagnose is usually combined with imaging and, among all the existing techniques, ultrasound is widely adopted.

Keywords: tendinopathy ; ultrasonography ; reliability

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## 1. Introduction

Soft tissue injuries of the lower limb are widely diffuse and put a significant financial burden on the health care systems worldwide. Tendinopathy is a common problem in the adult population that especially affects elite athletes and amateurs. The prevalence of tendinopathies in sporting people is 22%, with differences related to sport and to the level<sup>[1]</sup>. Patellar tendinopathy, one of the commonest tendinopathy, afflicts the 45% of elite volleyball players and the 32% of elite basketball players<sup>[2]</sup>, in elite soccer players, cumulative trauma disorder and re-injuries constituted 37% and 22% of all injuries<sup>[3]</sup>, while among non-elite players of all the different sports, the incidence is lower, only 14%, but still remarkable<sup>[4]</sup>. While the prevalence in elite athletes of the Achilles tendinopathy is 5%, and rises till 9% in recreational runners<sup>[5]</sup>. Quadriceps tendinopathy prevalence is about 14.2% of elite athletes, especially in sports that require repetitive jumps<sup>[2]</sup>. Proximal Hamstring Tendinopathy and Gluteus tendinopathy are most common among distance runners and athletes performing, but their prevalence is still nuclear<sup>[6][7]</sup>.

Abnormal kinematics and the overuse of the tendon have been implicated as the major risk factors for lower limb tendinopathy, even if the amount of loading that generates the pathology is still not clear<sup>[8][9]</sup>. Overuse is a key factor from 30% to 50% of all sporting injuries and the incidence has raised in recent decades, likely due to the growing involvement on athletes and greater demands in running and recreational sports. For what concerns the pathogenesis, different theories have been proposed<sup>[10]</sup>: (i) degenerative theory proposes that overloading causes changes in tendon cells and degeneration of the matrix<sup>[11]</sup>; (ii) failed healing theory suggests that, at the early stage of tendinopathy, a healing process that increases the production of protein is ongoing and causes a disorganisation of the matrix<sup>[12][13]</sup>; (iii) unloading theory suggests that not only overloading causes the changes in the cell and matrix of the tendon, but also unloading<sup>[14]</sup>; (iv) the last and widely accepted theory is the continuum theory, in which tendon pathology is composed by three stages (reactive tendinopathy, tendon disrepair and degenerative tendinopathy) in continuity between them<sup>[15]</sup>.

## 2. Influences

Ultrasound is a reliable, non-invasive and cost-effective imaging tool to assist the clinical diagnose of a tendinopathy. It is effective in the differentiation between a healthy tendon and an abnormal tendon; , but new techniques like UTC gave encouraging results for this process. Moreover, recently ultrasound has been combined with some treatments to guide the localization of the treatment only to the abnormal area of the tendon. Results are encouraging, but further research should investigate some of these techniques with high-quality studies.

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