Overuse Injuries

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KEYWORDS

- Tendinopathy • Tendinosis • Nitric oxide • Eccentric strengthening
- Sound assisted soft tissue massage (SASTM)
- Augmented soft tissue mobilization (ASTM) • Nitric oxide therapy
- Platelet-rich plasma (PRP)

KEY POINTS

- The term *tendinopathy* should be thought of as a broad spectrum of tendon disorders and used to describe any abnormal conditions of the tendon.
- Tendinosis refers to tendon degeneration without the clinical or histologic signs of an inflammatory response that is thought to develop over a prolonged time frame.
- Tendinitis can occur over a short period of time and refers to incomplete tendon degeneration resulting in vascular disruption with bleeding and an inflammatory repair response.
- Conservative treatment of tendinosis starting with a sound rehabilitation program seems to be the best place to start while reserving surgical approaches as a last resort for recalcitrant cases that have failed conservative management.

INTRODUCTION

Tendinosis is a condition that frustrates patients and clinicians alike. An active individual's quality of life often suffers because of chronic pain and the inability to perform athletic and occupation-related activities. In severe cases, the pain and dysfunction associated with tendinosis can affect activities of daily living. The condition is not easily treated with usual methods, such as physical therapy and nonsteroidal antiinflammatory drugs (NSAIDs). In fact, based on an evolving understanding of the pathophysiology of tendon injury, certain treatments may not serve any role at all in the treatment of tendinosis. This article reviews the epidemiology, pathophysiology, and emerging treatments related to chronic tendon injury.

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EPIDEMIOLOGY

Over the course of history, athletes have placed high demands on their bodies. In the past several decades, we have seen an increased activity level in these athletes and find that they are putting more demands on their bodies than ever before. The increased incidence and prevalence of overuse injuries becomes more apparent as these athletes spend more time training year round. The recreational athletes, the so-called weekend warriors, have continued to experience overuse injuries as they have in the past, but there has also been an increase in the level of overuse injuries among young athletes as they participate in the early specialization of their sport.[1,2]

Physical activity and exercise induces tremendous levels of stress on the muscles and tendons, thus increasing the risk of potential injury. The tendon plays a very important role as an active element of the muscle tendon unit in physical activity and, therefore, is subject to overuse injury.[3,4] It has been reported that approximately 50% of all sports injuries are secondary to overuse. The frequency of overuse injuries evaluated in the primary clinic setting is greater, proportionately, comprising twice the frequency of acute injuries.[1] Additional data report that overuse injuries account for approximately 7% of all physician office visits in the United States.[2]

Sports Injuries from an Epidemiologic Approach

Looking at the epidemiology of sports injuries can be quite different than that of other types of disease processes. The epidemiology of sports looks to quantify the occurrence of sports injuries in relation to who is affected by injuries, where and when the injuries occur, and what the outcomes are.[3] By understanding these details, there can be strategies and methods in place that will allow for better prevention and management of sports-related injuries. By prevention of these injuries, there can be a reduction in the short- and long-term social and economic costs associated with them.[5]

Age can also be a determining factor for different types of overuse injuries. It is a well-known fact that in the pediatric and adolescent population, tendons and ligaments are stronger than the epiphyseal plate. Because of this relative imbalance of strength, after acute trauma, a growing child is more apt to injure the epiphyseal plate before injuring a tendon or ligament. With regard to tendinous injuries seen in children, they are more likely to suffer injuries to the insertion sites of tendon at the apophyses rather than to the main body of the tendon as is commonly seen in the adult population.[6] According to Jarvinen,[7] older patients or athletes presenting to a musculoskeletal clinic are more likely to present with more traditional overuse injuries, including rotator cuff injuries (18%), Achilles tendon and calf injuries (20%), and medial and lateral epicondylitis, from sport- and work-related activity.

Another epidemiologic consideration is gender. Most tendon injuries have historically occurred in males, but the incidence in females, especially those younger than 30 years, is steadily increasing. One possible reason for this includes the dramatic increase in female participation in sports over the past several decades. These young women are not only participating in more sports but are also participating in more high-risk sports that can lead to both acute and overuse injuries.[8]

Achilles Tendinopathy/Overuse Injuries

There have been several studies that have looked at the cause, location, and types of tendon injuries in the Achilles. Several of these studies have revealed that most Achilles problems occur in men, with running being the main sport (53%). More than two-thirds of the injuries in competitive athletes involve the paratenon and