Soft Tissue Impingement of the Ankle

Pathophysiology, Evaluation, and Arthroscopic Treatment

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KEYWORDS

• Ankle impingement • Anterolateral ankle impingement • Synovitis • Meniscoid body • Ankle pain

KEY POINTS

- Chronic soft tissue impingement of the tibiotalar joint often begins with an inciting injury involving a severe inversion-plantar flexion or eversion-dorsiflexion biomechanical pathway.
- Understanding the mechanism of action responsible for primary pathology and completing a strong medical history is paramount to the clinician identifying the correct diagnosis.
- Loss of either the lateral or medial ligamentous structures responsible for stability of the ankle joint can lead to uncoupling of the foot and tibia ending in gross instability and chronic pain. These types of ankle injuries are often poly-traumatic, and prompt identification and adequate time for healing is required for consistent good long-term results.
- Soft tissue impingement of the ankle should be suspected in any patients who present with a chief complaint of chronic pain secondary to an injury or sprain.
- When conservative treatment options fail, arthroscopy as a monotherapy, and sometimes combined with open resection of this pathology, is an effective treatment paradigm that has produced good to excellent long-term results.

INTRODUCTION

Soft tissue impingement (STI) syndrome is one of 3 causes of a larger all-encompassing joint impingement pathology, which includes bone and neuropathic entrapment as well.[1] It has been described in the literature for multiple joint surfaces

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within the body. Altered joint biomechanics and friction of joint tissues combine to cause chronic pain and often functional instability. Regarding arthroscopic treatment of STI in the lower extremity, much of the literature has been centered on athletes and the tibiotalar joint, in particular anterior ankle impingement. Originally described by Morris[2] in his report of athletes ankle in 1943, STI of the ankle joint now encompasses a combination of pathologies whereby anatomic structures surrounding the tibiotalar joint become entrapped leading to decreased range of motion (ROM) and often present as chronic pain syndrome clinically. Although the most common form of STI to the ankle is anterolateral in location, posterior and anteromedial impingement is also discussed in this article. Furthermore, a discussion of biomechanical deficiencies, that is, varus/valgus foot, and how they may effect location and cause of STI of the ankle is explored along with pathophysiology, clinical and diagnostic evaluation, current treatments, and long-term outcomes.

ANATOMY

Ankle sprains involving the ligamentous soft tissue structures of the ankle joint are most commonly seen in athletic injuries, with as much as 20% of them showing residual and even chronic pain symptoms.[3] Pathologic findings after ankle sprain injuries often include impingement lesions, peroneal tendinopathy, ligamentous laxity, boney sequela, and even osteochondral lesions.[4] Although most resolve with rest, ice, compression, elevation, and physical therapy, a study by Smith and Reischl[5] in 1986 revealed that 50% of the study population of basketball players showed residual clinical symptomology and 15% even noted decreased performance capabilities. Often times the extent and location of soft tissue pathology and painful tibiotalar instability is determined by foot position and the direction and magnitude of forces applied to the joint.

Two ligamentous complexes stabilize the tibiotalar joint. Laterally, the joint houses 3 ligamentous structures: the anteroinferior tibiofibular ligament (AITFL), the posteroinferior tibiofibular ligament (PITFL), and the interosseous tibiofibular ligament, which is a continuation of the interosseous membrane. This structure known as the lateral collateral ligament (LCL) complex of the ankle functions to allow the distal tibia and fibula to act as one unit when adapting to changes in ground reactive forces being applied. Medially, the deltoid ligament stabilizes the ankle joint with both superficial and deep attachments known as the medial collateral ligament (MCL) complex of the ankle. The superficial portion crosses 2 joints, including the ankle and subtalar joint, whereas the deep complex crosses only one and has been implicated in the cause of medial STI syndrome. The inferior lateral ligament complex (LLC) is composed of the anterior talofibular ligament (ATFL), calcaneofibular ligament, and the posterior talofibular ligament (PTFL); although it is not directly associated with the ankle mortise, it too has been implicated in the pathophysiology of ankle STI syndrome.

CAUSE

By far, the most common type of STI of the ankle joint is anterolateral in its location. Anterolateral STI (ALSTI) is implicated in approximately 3% of all ankle sprains and is associated with injuries involving both the LCL and LLC, which often occur because of a plantar flexion inversion mechanism.[6,7] It should be considered as a primary diagnoses in patients with long-standing ankle pain or functional ankle instability when bone and arthritic pathology have been ruled out. ALSTI encompasses 3 types of