

## Tibiofibular Ligament Damage

Although the mechanism and classification of ankle sprains are considered relatively straightforward, athletes with prolonged symptoms can have an unrecognized injury. The vast majority of ankle sprains are plantar flexion/inversion sprains which affect the anterior talofibular and calcaneofibular ligaments. A number of complications and co-injuries may occur that prolong recovery due to persistent pain or mechanical interference in the performance of rehabilitation exercises. Commonly sought after complications are:

- osteochondral fracture of the talar dome or loose body;
- subluxating or dislocating peroneal tendons;
- bifurcate ligament sprains;
- fracture of the base of the fifth metatarsal;
- achilles tendon injury.

What is often not appreciated is the potential injury to the distal stabilizing elements of the tibia and fibula -- the inferior tibiofibular ligament. This is also referred to as an ankle syndesmosis injury. Like all ligament damage, there are varying degrees of tearing and a variety of subsequent reactions in the tissue to attempt healing and stabilization.

When full rupture occurs, fracture and/or dislocation is likely. This is referred to as diastasis and is easily viewed on radiographs. Lesser degrees of injury are notoriously difficult to assess both clinically and radiographically, yet may result in a prolonged recovery time. Tests for stability of this connection between the tibia and fibula attempt to either increase pain at the distal tibiofibular area or demonstrate excessive movement.

A recent study<sup>1</sup> reported on an attempt to determine the interexaminer reliability of four tests designed to detect tibiofibular ligament damage. There was no attempt to determine the validity of the tests in this study. To test for validity would require that all subjects be evaluated with magnetic resonance imaging (MRI) because this is the only imaging tool that might determine lesser degrees of injury than full rupture. Of course, the use of MRI as a screening tool is not recommended due to excessive cost.

This study attempted to determine three things:

1. Are the tests reliable?
2. Are the tests comparable and supportive of each other? (That is, do the tests correlate with each other on positive responses, and does the addition of one of the test add to the sensitivity of the test?)
3. Do positive results from a test correlate with a prolonged recovery (compared to the natural recovery time of a standard ankle sprain)?

The four tests tested were:

1. Syndesmosis ligament palpation -- Palpation over the anterior talofibular ligament causes an increase in pain if the test is positive.
2. Squeeze test -- Manually compressing the fibula to the tibia above the midpoint of the calf increased pain over the distal tibiofibular ligament area if the test is positive.
3. External rotation test -- With the patient sitting with the knee at 90 degrees flexion and the ankle held in neutral, pain is increased with passive external rotation of the foot and ankle if the test is positive.
4. Passive dorsiflexion test -- This test was modified to indicate whether limited range of motion or increased pain on passive dorsiflexion could be affected by an examiner adding compression externally while the passive dorsiflexion was repeated. A positive result was an increase in ankle range of motion or a decrease in end range pain with external examiner compression at the distal tibiofibular joint.

Note that a common test used for evaluating the distal tibiofibular joint was not included in this study. This test involves an attempt at moving the calcaneus and talus side-to-side in an effort to elicit a "thud" as the talus abuts against the fibula or tibia. This indicates excessive movement due to a torn tibiofibular ligament.

The results of this study indicated:

- The external rotation test had the highest degree of inter-rater reliability (kappa of 0.75).
- If all test were used to evaluate an individual, they would likely not give similar results.
- Positive test results for the combination of the external rotation test and the dorsiflexion-compression test correlated with a prolonged recovery time.

Other studies<sup>2,3</sup> indicate a predictive value for positive tibiofibular ligament tests and prolonged recovery.

A sequelae to damage to the distal syndesmosis is synostosis. Although this is most common secondary to fracture, it may occur as a result of damage to the inferior tibiofibular ligament. Pain is worse with the push-off. Persistent pain or swelling after activity is common. Dorsiflexion with the ankle in neutral is significantly restricted. Radiographically, there is clear evidence of ossification between the distal tibia and fibula.

Finally, soft tissue impingement is possible. It has been shown in one study<sup>4</sup> that there is an extra distal fascicle of the anteroinferior tibiofibular ligament which can cause impingement at the distal fibula and talus, causing damage to the talar surface. Pain is increased at the distal ankle with passive dorsiflexion and is relieved by plantar flexion. Patients often reported an anterior popping sensation. In this study, the solution was surgical excision, which seemed to provide significant relief to the majority of patients.

## *References*

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*Thomas Souza, DC, DACBSP*  
*San Jose, California*  
arrwes-aol.com

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