

# Ankle Injury

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## Ankle Syndesmosis Injury – Recognition & Surgical Management

Up to 18% of ankle sprains in the general population are thought to involve the syndesmosis – the distal tibiofibular joint. This could be as high as 32% in some athletic populations. The diagnosis is often missed in the early stages. Unfortunately, delayed treatment can lead to chronic instability & early onset of degenerative arthritis.

### Mechanism

The injury is most common in contact sports. The usual mechanism is external rotation. With the foot planted, the tibia & fibula internally rotate, forcing relative external rotation of the talus. This can occur with concomitant plantarflexion or dorsiflexion. Other mechanisms include a blow to the outside of the lower leg, and following a severe inversion ankle sprain.

### Anatomy

The primary ligaments that stabilise the joint are the anterior inferior tibiofibular ligament (AITFL), the interosseous ligament (IOL), the posterior inferior tibiofibular ligament (PITFL) & the deltoid ligament complex. All syndesmosis injuries involve some degree of disruption to the AITFL and deep fibres of deltoid, while severe injuries may involve disruption of all four ligaments. Normally, no more than 1 mm of separation is possible between the distal tibia & fibula. 1.5 mm or more separation indicates instability and the need for surgery.

### Examination

Clues to the injury include the mechanism, an inability to weight-bear with sensations of instability, difficulty pushing off the front of the foot, and early swelling with or without bruising that is high up on

the ankle. On palpation, there will usually be tenderness over the AITFL, and often over the deltoid ligament. The entire fibula should be palpated, as syndesmosis injury is sometimes associated with a proximal fibular fracture (Maisonneuve fracture). Numerous physical tests have been described. The most reliable is the external rotation stress test. The patient sits with the knee and ankle at 90°. The examiner stabilizes the lower leg with one hand, while gripping the midfoot with the other hand & applying an external rotation force. Pain &/or apprehension adds to the suspicion of syndesmosis injury. The ‘squeeze test’ has also been described but is less reliable. Squeezing the tibia & fibula (medial and lateral force respectively) at mid-shin level results in separation of the syndesmosis & may produce pain.

### Radiography

The recommended x-ray views are weight-bearing antero-posterior, lateral, and mortise views. However, the patient is often hesitant to bear weight, and x-ray findings may be inconclusive. MRI is the imaging of choice, as it will provide additional information regarding soft-tissue injury to the relevant ligaments, including the extent of deltoid ligament disruption. It will also demonstrate concomitant osteochondral lesions, and injuries to other ligaments such as the lateral ligament complex, and the anterior tibiotalar ligament.

### Management

In the rare case of Grade I injury, with no joint separation and no instability, the management is conservative, For all Grade II to III injuries resulting

in joint diastasis, surgical stabilization is required. Traditionally, surgical stabilization has been achieved via screw fixation across the syndesmosis. More recently, the use of 'tightrope' fixation has increased in popularity. In cases of distal fibular or bi-malleolar fracture, some form of plate fixation will also be required.

#### **Screw fixation:**

A screw is placed proximal and parallel to the ankle joint, across the syndesmosis. Sometimes a second screw is implanted for added stability. While some surgeons prefer to keep the screw in place, up to 50% of the general population, and 75% of the athletic population, require a 2<sup>nd</sup> procedure for screw removal. While an inherently stable joint, the inferior tibiofibular joint does undergo a small degree of 'spreading' & rotation during weight-bearing, particularly that involving ankle dorsiflexion or external rotation. Screw fixation blocks this movement and is non-physiological. Failure to remove the screw is associated with high rates of screw breakage and osteolysis.

#### **Suture button with tight-rope fixation:**

A non-absorbable fibrewire suture is placed across the syndesmosis, and anchored on the bone on either side using an endobutton. The advantages of this procedure are that the wire allows physiologic mobility of the joint, there is a quicker recovery and return to sport, reduced risk of osteolysis, and most authors report that there is rarely any need for hardware removal. However, in one study with a 20-month follow-up, it was found that 1 in 4 patients required hardware removal<sup>1</sup>.

The next newsletter will discuss the rehabilitation of syndesmosis injuries.

#### **References**

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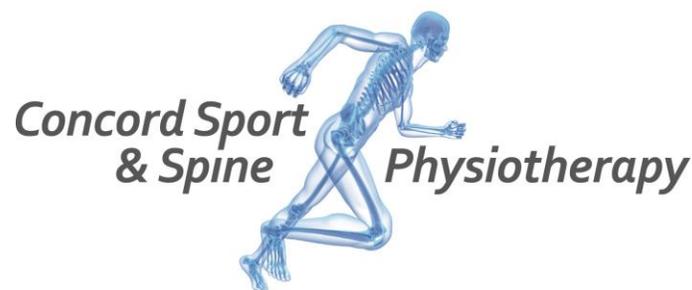
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