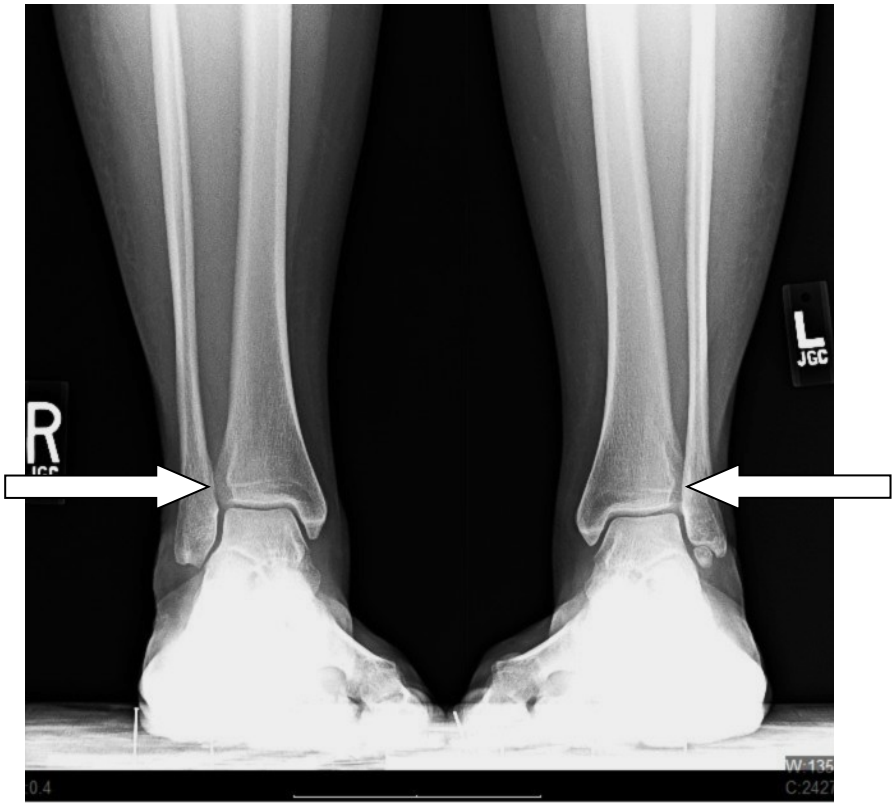
Ankle Syndesmosis Injury

The ankle syndesmosis is composed of ligaments that hold the two lower leg bones (tibia and fibula) together and maintains the talus bone and the foot centered in the ankle mortise. Although less frequent than a lateral ankle sprain, injury to this ligamentous structure commonly occurs just above the ankle joint and is referred to as a high ankle sprain. Tearing of the syndesmosis occurs with ankle injuries that typically rotate the foot outwards causing the talus to tear the syndesmotic ligaments and pry the tibia and fibula apart at the ankle. A fracture of the fibula, posterior malleolus of the tibia, and/or a sprain of the deltoid ligament (inner ankle ligament) may also occur with this mechanism.



Weight-bearing x-ray demonstrating increased space between the tibia and fibula on the right leg as compared to the left, indicating an injury to the syndesmosis.

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Frequent Signs and Symptoms

- Pain and tenderness between the tibia and fibula above the ankle joint
- Difficulty and pain bearing weight immediately after the injury
- Pain and delayed swelling
- Pain with outward rotation of the foot
- Pain and tenderness at the ankle and up the leg along the syndesmotic ligaments
- Pain and tenderness on the inside of the ankle if injury to the deltoid ligament
- Pain, tenderness and crepitus ("crunching") if associated fibular fracture.

Etiology (Causes)

A sprain is caused by force that exceeds the strength of the syndesmosis. This injury is usually the result of planting and twisting the rest of the body away from the foot (external rotation load), or from a forceful landing with the feet flat driving the ankle up and forcing the tibia and fibula apart (dorsiflexion load).

Risk Factors

- Sports involving cutting or sudden turns/ change of directions (such as soccer, basketball, football, skiing)
- Falling, twisting while weight bearing
- Motor vehicle accidents

Prevention

- Maintaining appropriate conditioning, especially with history of previous ankle sprains
    - Proprioception (balance and neuromuscular control)
    - Muscle strength and endurance
- Functional braces may be effective in preventing injury, especially re-injury, in cutting sports

Outcomes

If the ankle syndesmosis is sprained but remains stable with no widening between the tibia and fibula under stress, the injury can be treated non-operatively and the patient can return to full activity with proper rehabilitation; however, the healing and rehabilitative process take longer than typical ankle sprains. As general rule of thumb, patients are usually able to return to activities/sports after 3 weeks plus an additional week for every centimeter of tenderness of the syndesmotic ligaments above the level of the ankle joint. If the syndesmosis is unstable with weight bearing films or stress x-rays, surgery is required to reduce or re-align the tibia and fibula. Surgical recovery may take 4 to 6 months.

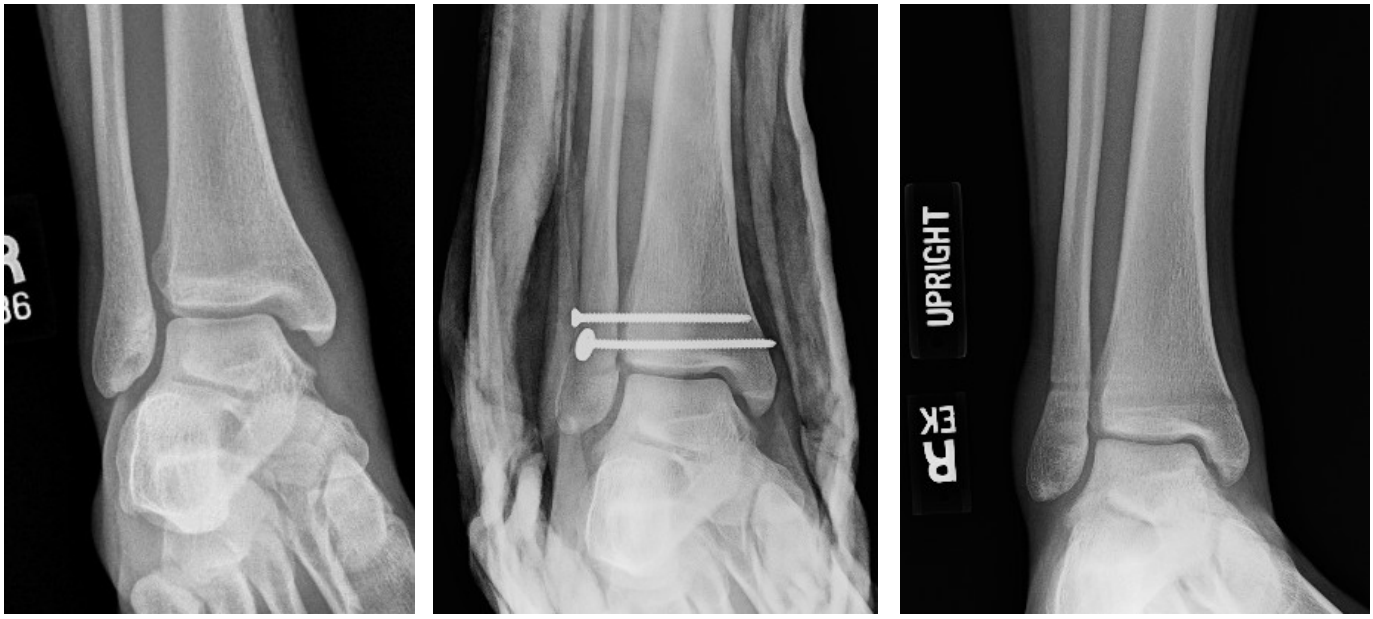
Potential Complications

- Re-injury, particularly if the initial injury has not properly healed
- Delayed healing or ongoing symptoms with activity
- Additional injury to surrounding muscles and ligaments due to compromised stability of the ankle joint
- Failure of the syndesmotic ligaments to heal, persistent widening of the syndesmosis, abnormal stress on the ankle joint, limitations and pain with activities, and accelerated degeneration of the ankle joint.

Treatment Considerations

Initial treatment consists of rest and reduced weight bearing with use of crutches. Patients may use ice and anti-inflammatory medication for pain control after the initial injury. Patients with stable injuries will work with a physical therapist or athletic trainer to restore range of motion and strength. Return to bearing weight and walking may need to be gradual, followed by increased functional strength and proprioceptive exercises before returning to running and sports activities.

Unstable syndesmotic injuries are treated with surgery to reduce and internally fix the ankle syndesmosis and allow it to heal in the proper position. This procedure is done using screws or other fixation devices to stabilize the ankle syndesmosis. This is later followed by a hardware removal procedure and physical therapy to restore ankle range of motion, strength, and function.



Left: x-ray of widened syndesmosis that was unstable; **Middle**: x-ray while in splint after surgical fixation with screws; **Right**: x-ray after screw removal -all x-rays are ankle mortise (oblique) views-

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Modalities (Heat and Cold)

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 10 to 15 minutes every 2 to 3 hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice bath.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack.

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