

High Ankle Sprains

What is a high ankle sprain?

A high ankle sprain is an injury to the distal tibiofibular syndesmosis. The syndesmosis includes structures such as the anterior-inferior tibiofibular ligament (AITFL), posterior-inferior tibiofibular ligament (PITFL), interosseous ligament (IOL), inferior transverse ligament, and interosseous membrane (IOM). These are highlighted in the figure below.

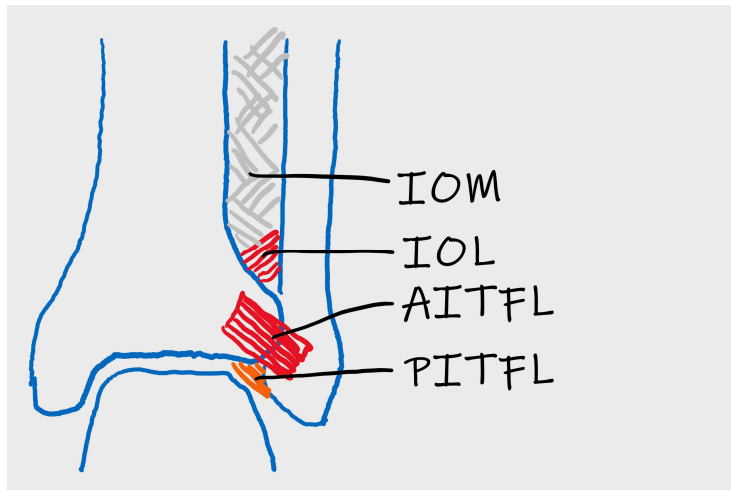


Figure 1: the distal tibiofibular syndesmosis

These injuries are typically associated with high-speed collisions or injuries where the foot is forcefully externally rotated while in a dorsiflexed position. Other ankle ligaments may be injured concurrently, and it can occur with or without associated fractures.

Why is it important to recognize this injury?

High ankle sprains should be differentiated from the more common collateral ligament ankle sprains, because management and prognosis are different. In the absence of associated fractures, these injuries may be easily missed on imaging and exam, and can be associated with prolonged recovery and chronic pain.

How do you diagnose a high ankle sprain?

History: suspect high ankle sprain if the mechanism is one of forced external rotation of a dorsiflexed foot, or a collision. Pain is usually diffuse, and worse with walking up hills, pivoting, or doing single leg heel raise.

Physical exam:

- Start with a general ankle exam to rule out other concurrent injuries. This may include an examination of the collateral ligaments, as well as determining the need for imaging with the Ottawa Ankle Rule (http://www.theottawarules.ca/ankle_rules)
- The following maneuvers are specific to syndesmotomic injuries:

- **Crossed leg test** (<https://youtu.be/Qb-euOa57TE>): in sitting position, ask patient to cross their affected leg over the other leg with the distal third of fibular resting on the opposite knee. Apply down-ward pressure over the medial knee of the painful leg. Positive test is reproduction of pain in the ankle.
- **Fibular translation test** (<https://youtu.be/W3SHqKqkK14>): stabilize tibia with one hand, then grasp fibular with other and attempt to translate it anterior or posterior. A painful soft end point with greater than 2 to 3 mm of translation, or increased translation compared to contralateral side is a positive examination.
- **Tibiofibular squeeze test** (<https://youtu.be/ANgWSz0UoDg>): Squeeze the fibular and tibia together using the palms. Pain at syndesmosis is a positive exam.
- **Dorsiflexion external rotation stress test** (<https://youtu.be/s53uzyUv0bc>): Dorsiflex the foot while applying an external rotation force. Pain is a positive test.
- **Stabilization tape test**: patient is asked to do dynamic movements including walking, heel and toe walking, single legged heel raise, and standing pivot. Then the ankle is tightly taped in a circumferential fashion just above the ankle joint, and patient is asked to repeat the movements. Positive test is reduction of pain with taping.
- **Direct palpation** – tenderness along the anterolateral joint line and proximal compared to typical sprain. Tenderness on palpation may extend proximally along the fibula.

Imaging: Standard lower extremity weight bearing x-rays (AP and mortise views) may show increased tibiofibular clear space (normal < 6mm), decreased tibiofibular overlap (normal > 6mm on AP view, > 1 mm on mortise view), and increased medial clear space (normal < 4mm). See Figure 2 for reference. Optional stress views (external rotation stress or gravity stress views) may help assess for ankle stability.

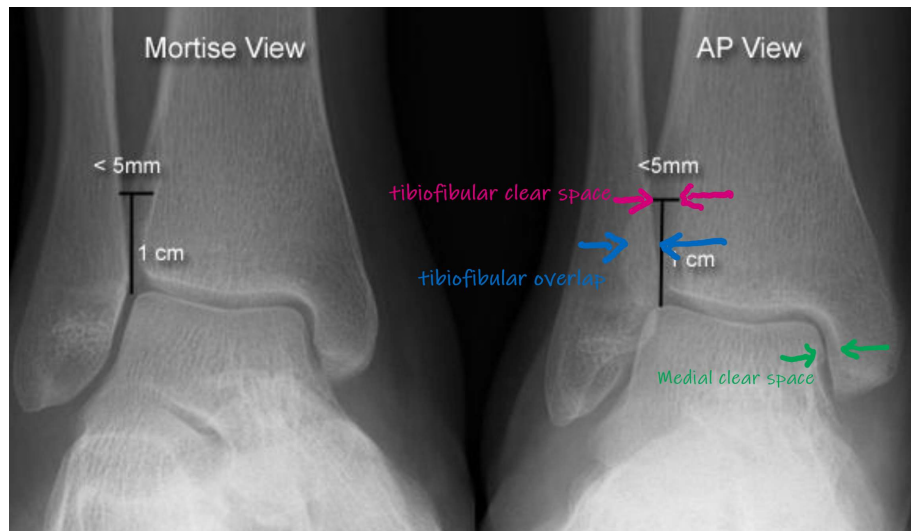


Figure 2: Radiographic features of a normal ankle. Image from Orthobullet and altered to include labels (<https://www.orthobullets.com/foot-and-ankle/7029/high-ankle-sprain-and-syndesmosis-injury>)

CT/MRI are more sensitive and specific but are often not required to make the diagnosis – they should be considered for operative planning or if high suspicion and plain radiographs are normal.

Management:

Without gross instability, high ankle sprains should be treated non-operatively. In contrast to the more common lateral ankle sprains, syndesmotic injuries should be immobilized initially, and patient made non-weight bearing. The immobilization and non-weightbearing phase may be up to 2-3 weeks (or shorter if milder injuries), followed by protected weightbearing in a CAM boot and physiotherapy rehabilitation. High ankle sprains may take over a month to heal.

Surgical indications include unstable ankle on stress views, presence of associated fractures, and failure of conservative therapy.

Summary:

High ankle fractures are syndesmotic injuries that can occur with or without a concurrent fracture and should be suspected when the mechanism is forced external rotation of a dorsiflexed foot or collision. It should be differentiated from a collateral ankle ligament sprain because management and prognosis are different. These injuries should be initially treated with a period of immobility and non-weightbearing, and slowly progress to functional rehabilitation.

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References^{1,2}:

1. Wake, J. & Martin, K. D. Syndesmosis Injury From Diagnosis to Repair: Physical Examination, Diagnosis, and Arthroscopic-assisted Reduction. *J. Am. Acad. Orthop. Surg.* **28**, 517–527 (2020).
2. High Ankle Sprain & Syndesmosis Injury - Foot & Ankle - Orthobullets.
<https://www.orthobullets.com/foot-and-ankle/7029/high-ankle-sprain-and-syndesmosis-injury>.