

## Introduction

- The ankle is the most common site of athletic injuries, comprising 50% of all lower extremity injuries in high school athletes. [1] According to the National Collegiate Athlete Association's Injury Surveillance System, it is among the most prevalent injuries sustained by athletes, accounting for 7% to 15% of all collegiate athletic injuries, with the highest rates among men's and women's basketball players. [2-3] Most ankle sprains resolve uneventfully without sequelae; however, 30% of patients experience recurrent functional or mechanical instability. [4] Therefore, those patients presenting with persisting symptoms for three months should be evaluated for chronic ankle instability (CAI). This report aims to familiarize the reader with the evaluation and management of CAI and associated conditions from the perspective of the consultant surgeon.

Keywords: ankle sprains, ankle ligaments, treatment, postoperative care.

## Anatomy of the ankle

- The ankle joint is a hinged synovial joint formed by articulating the talus, tibia, and fibula bones and stabilized by collateral ligaments medially and laterally. Medially, the main stabilizing ligament is the deltoid ligament, which consists of four ligaments that form a triangle connecting the tibia to the navicular, the calcaneus, and the talus; and the lateral ankle ligaments consist of a 3-part complex: calcaneofibular ligament (CFL), anterior talofibular ligament (ATFL), and posterior talofibular ligament (PTFL). A *syndesmosis* is a fibrous joint that maintains integrity between the tibia and fibula, which are linked by a strong membrane or ligaments: the distal anterior tibiofibular ligament, the distal posterior tibiofibular ligament, the transverse ligament and the interosseous ligament (IOL; Figure 1).

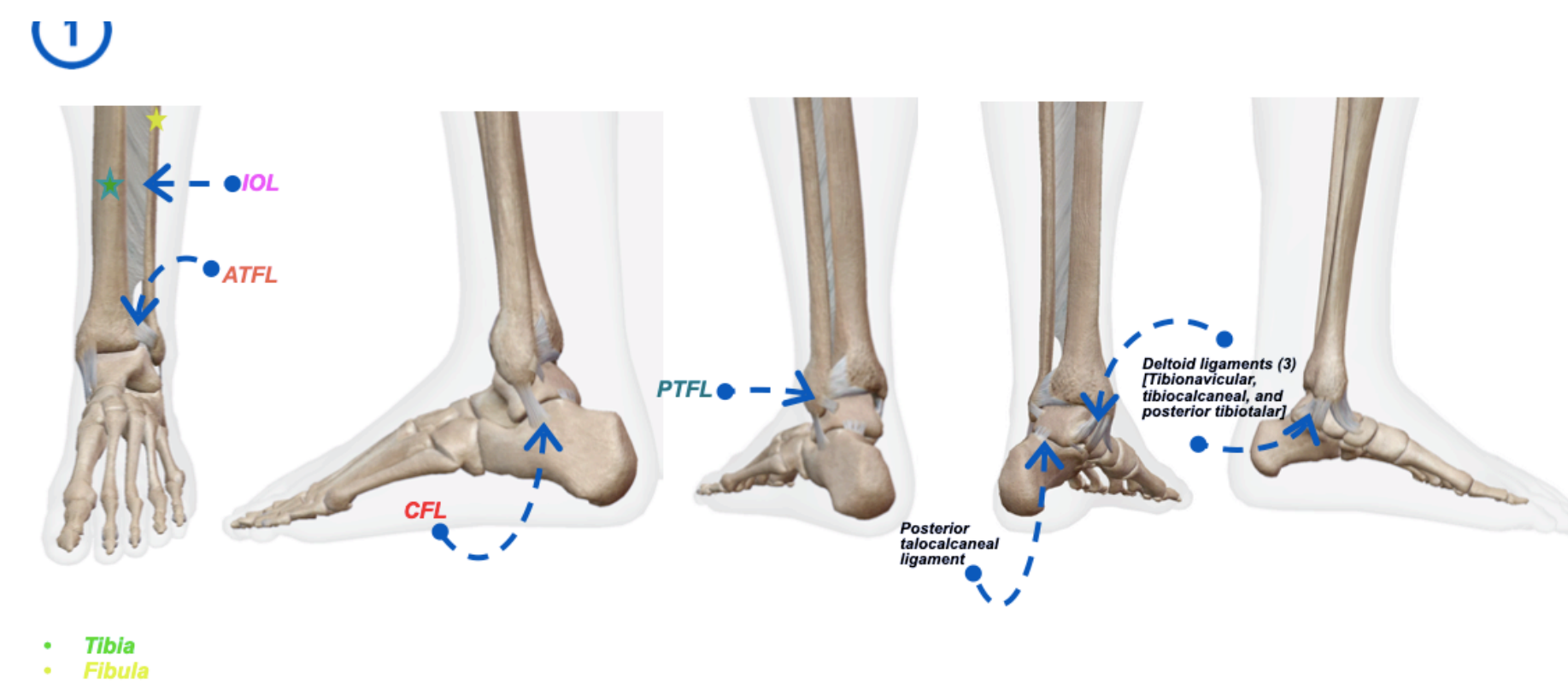


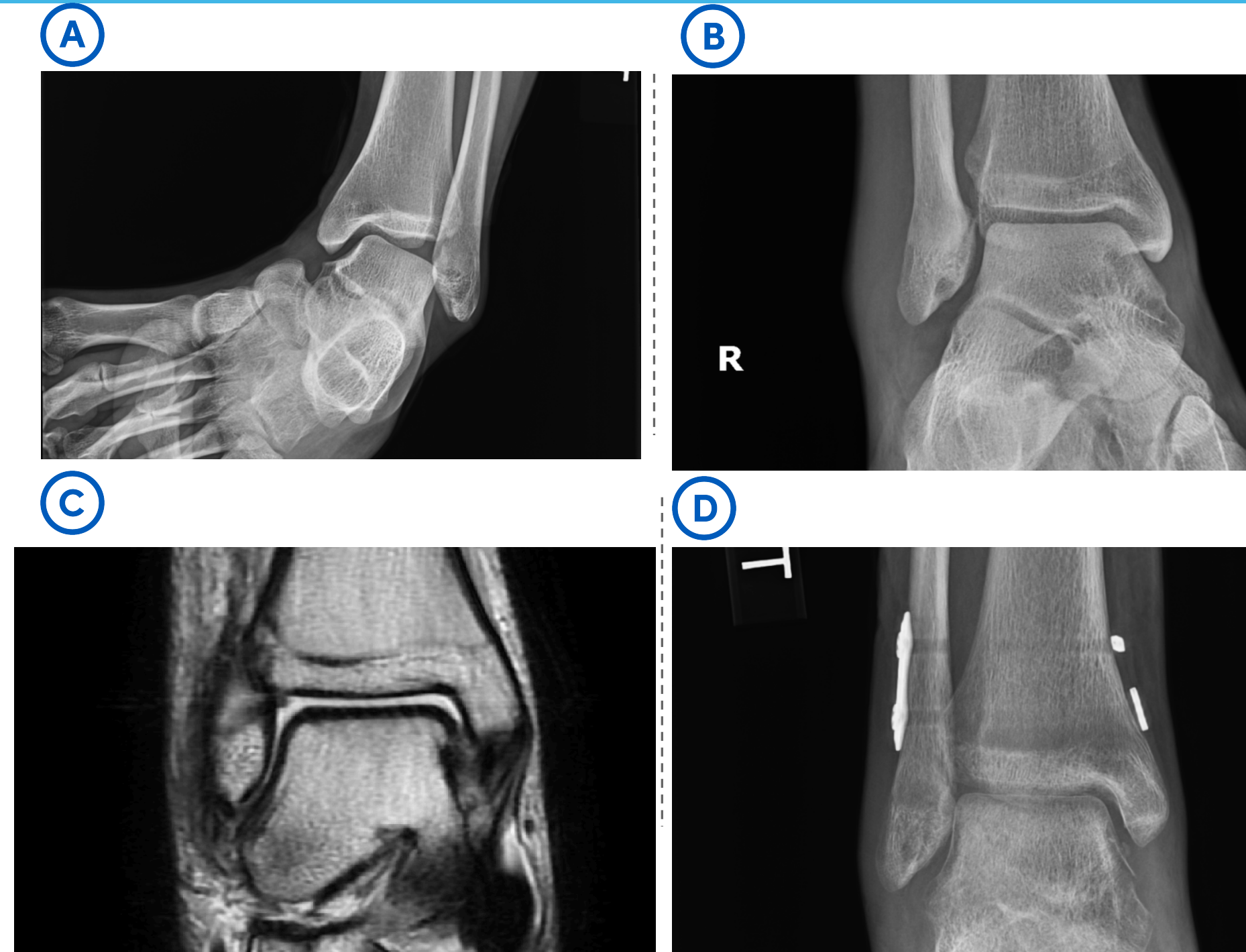
Figure 1: Ankle anatomy

## Case

- A 14-year-old male with no pertinent past medical history, presented to clinic for evaluation of right ankle injury.
- The patient was playing pickup basketball on March 19, 2023, when another player came down unopposed onto his right ankle. The patient had immediate pain, swelling, and difficulty bearing weight.
- The mother states that the child sustained a similar ankle injury several months ago that healed with conservative treatment.
- Pertinent findings on physical examination were tenderness to palpation of the deltoid ligament, lateral malleolus, lateral ligamentous complex, syndesmosis, positive pain with external rotation of the ankle.
- Multiple radiographs and stress images of the right ankle were reviewed:
  - There was a loss of tibia-fibular overlap consistent with syndesmotom injury. A Talar tilt stress test was performed in the office and reviewed—no abnormal talar tilt.
  - The lateral tibiotalar translation stress test was performed in the office and reviewed. Anterior subluxation of talus on tibia.
  - Syndesmosis appears intact on MRI.
- Complete rupture of ATFL noted on MRI with coberating positive lateral tibial talar translation stress radiographs. CFL is not well visualized on MRI; however, talar tilt stress radiographs are negative.
- The patient's history and physical examination of ankle instability which resulted in the patient's second significant ankle injury over the past six months along with radiographic findings that are commensurate with right ankle syndesmotom injury and complete ATFL rupture.
- Due to the complete rupture of ATFL and continued ankle instability, operative management was recommended: Open reduction internal fixation, ATFL repair, and internal brace/Broström augmentation which has improved stability, low complication rate, and good clinical outcome scores. [6]

### Surgery:

- The syndesmosis was directly visualized. The anterior tibiofibular ligament was disrupted. The posterior tibiofibular ligament was intact. There was pathologic anterior/posterior translation of the fibula within the incisura fibularis. Post-op imaging D. External fixation with plate over the lateral malleolus with syndesmosis tracks placed and medial anchors on the tibia. Alignment is nearly anatomical and hardware is intact and in good position.
- The patient was placed in a well-padded molded 3-sided bulky Jones splint secured with an Ace wrap.
- The patient had physical therapy postoperatively with excellent functional outcomes to date.



Radiographic evaluation as mention in case section.

## Discussion

- It is common for primary care providers to see a patient who complains of an ankle sprain that "will not go away." While the etiology of such discomfort is heterogeneous, an evaluation for CAI is warranted on those patients presenting with recurrent ankle sprains, perception or frequent episodes of the ankle giving way, persistent pain, swelling, weakness, limited range of motion, and diminished self-reported function for more than 3-6 months from the initial lateral ankle sprain.
- Assessment of the patient with CAI begins with a focused history and physical examination:
  - Mechanism of the most recent injury.
  - The ability to bear weight.
  - The frequency of instability episodes and ankle sprains.
  - Previous treatments.
  - Evaluation of gait and standing alignment (to look for varus hindfoot alignment), edema, location of ecchymosis, and point of maximal tenderness (ATFL, CFL, peroneal tendons, or syndesmosis). Range of motion of both the ankle and subtalar joints. Neurovascular examination and special tests, including Anterior drawer test (the integrity of the anterior talofibular ligament), Crossed-leg test (positive in high ankle syndesmotom sprain), inversion stress test or talar tilt (Integrity of the calcaneofibular ligament), and Coleman block test (Hindfoot flexibility and pronation of the forefoot).

### Our preferred postoperative protocol:

- Initial 2- to 6-week period of cast, splint, or boot immobilization to prevent stressing of the repaired or reconstructed tissue by inversion.
- An ankle-stirrup splint is worn from 6 weeks to 3 months to prevent accidental inversion, which could injure the healing ligaments.
- Rehabilitative exercises are started after this initial period of immobilization. Initial therapy focuses on restoring ankle range of motion.
- At 6 weeks postsurgery, physical therapy and subtalar-joint range of motion may begin with proprioceptive training and eversion strengthening. Inversion stretching is not permitted until 3 months postsurgery.
- At 3 months, the athlete is allowed to return to play in a functional brace. Full return to play can be considered when an athlete no longer experiences pain or swelling; demonstrates normal ankle stability, strength, and neuromuscular control; and is able to perform a set of relevant functional tests.

## Conclusion

Persistent lateral ankle pain for more than three months after an acute inversion injury should prompt to the search for not only CAI but any of several other injuries that can occur concomitantly with LAS. Thus, referral to an orthopedic surgeon is imperative, as high ankle sprains have a higher morbidity than LASs.

## References

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