

Medial and Lateral Ankle Injuries

Contributors

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Overview

Up to 70% of the general population have suffered from an ankle sprain in their lifetime.¹ Those who are physically active and/or participate in sport are at a high risk of sustaining an ankle injury.² The majority of ankle sprains are caused by inversion or eversion of the ankle. Injury to the lateral ankle ligaments are more common than medial ankle sprains.³ The Ottawa ankle rules should be used correctly to deem if a radiograph is needed to rule out a fracture following any traumatic ankle injury.⁴ Correct diagnosis and management is important in these injuries as lateral ankle sprains have the highest re-injury rate of any lower limb MSK injury. A large number of ankle sprains develop chronic ankle instability.⁵

Anatomy

The ankle joint is formed by primarily three bones: the tibia, fibula and the talus bone. There are two main ligament groups around the joint. The lateral ligament group (Image 1a) can be injured by an inversion mechanism, with the ATFL being most likely to be injured. The medial ligament group (Image 1b) can be injured in an eversion mechanism.

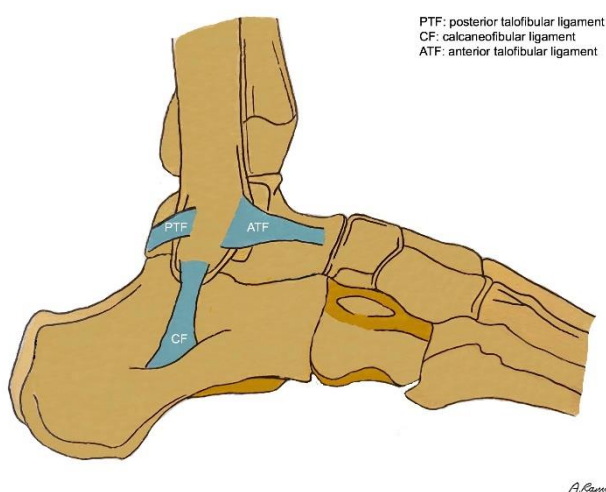


Figure 1a: The lateral ankle ligaments consist of three individual ligaments.

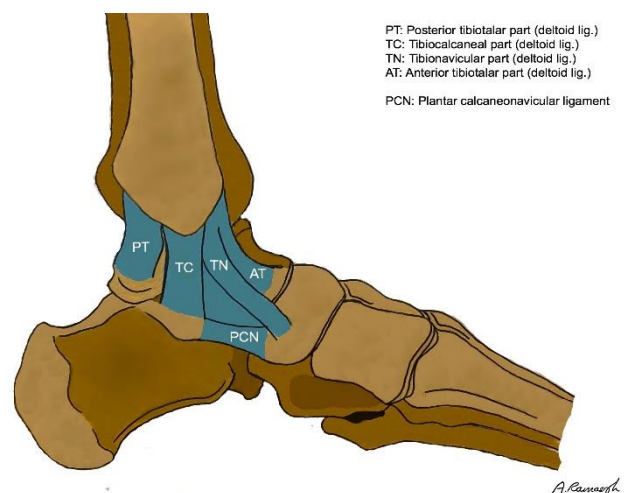


Figure 1b: The medial ankle ligament, the deltoid ligament is composed of 4 smaller ligaments

Case Study

Ms Williams is a 31-year-old amateur runner. Whilst out on a trail run, she tripped over a log resulting in the inversion of her left ankle. She felt some immediate pain on the outside of her ankle and noticed swelling almost immediately. She was able to walk back to her car and drive to the emergency department. On assessment in A&E, there was obvious swelling to the left ankle however no tenderness over the lateral malleolus. It was determined that she did not require a radiograph (as she was Ottawa ankle rules negative) and was diagnosed with a lateral ankle sprain. She was advised to keep the ankle elevated for the first 48 hours and given some ankle strengthening exercises to do before returning to running over the next few weeks.

Aetiology

Ankle injuries have a high prevalence within daily living activities as well as sport. Although the high incidence and prevalence, it is approximated that 50% of the ankle injuries do not seek medical attention.⁶ Lateral ankle sprains are more common than medial, and these usually involve the anterior talofibular ligament (ATFL).⁶

Clinical Features

Mechanism of injury often can help determine the likely anatomical injury. An inversion injury, often alongside plantar flexion, is the most common mechanism of injury for ankles, leading to a lateral ankle sprain.⁶ Over eversion of the ankle often leads to an injury to the deltoid ligament.

Chronic ankle instability can develop after an acute injury. This is defined as persistent pain and swelling alongside recurrent ankle sprains for at least 12 months post original injury.

Associated injuries with a low ankle sprain are 5th Metatarsal fractures, mid foot ligament and syndesmotic injuries (See separate info sheets).

Diagnostics

The Ottawa ankle rules (box 1) are used to determine the need for a radiograph to rule out a fracture in severe ankle injuries up to one week post injury.⁴ 15% of radiographs performed following the use of these rules show a fracture.⁴

An Ankle radiograph is required if:	
Malleolar foot pain	Mid foot pain
AND ONE OF	AND ONE OF
Tenderness over the posterior (6cm) edge of lateral malleolus	Bony tenderness at the base of the fifth metatarsal
OR	OR
Tenderness over the posterior (6cm) edge of medial malleolus	Bony tenderness over the navicular bone
OR	OR
Inability to weight bear for four steps BOTH immediately after the injury and in the emergency department	Inability to weight bear for four steps BOTH immediately after the injury and in the emergency department

Box 1: Ottawa Ankle Rules: adapted from <https://bjsm.bmj.com/content/52/15/956#table-wrap-group-1>⁴

A positive anterior drawer test, along with pain over the distal fibula and/or a haematoma present are likely to indicate a rupture to the lateral ankle ligaments. Clinical examination is often optimised 3-5 days post injury, once the swelling has reduced.⁸ Ultrasound has a similar sensitivity and a lower specificity to delayed clinical examination, including the anterior draw test.⁴

The high prevalence of ankle sprain limits the use of MRI in an acute setting, however, if symptoms persist MRI is often the preferred imaging modality.⁸

Ankle Sprains have a grading system (Table 1) as seen below. The higher the grading of the injury, the longer the recovery time.

Grade	Injury	Symptoms and signs	Average Recovery time
I	Microscopic ligament tear	Minimal swelling Localised Tenderness No laxity	DAYS
II	Partial ligament tear (macroscopic damage)	Diffuse pain and localised swelling Bruising may be present Moderate laxity in ankle draw tests	WEEKS
III	Full rupture of the ligament	Heard/felt a pop Severe ankle swelling and pain Inability to bear weight Obvious laxity in ankle draw test and talar tilt test	MONTHS

Table 1: Ankle ligament injury grading system

Management Options

The most well-known acronym for the management of soft tissue injuries such as ankle sprains is RICE- Rest, Ice, Compression and Elevation. There is limited research behind the efficacy of ice and compression in reducing ankle sprain associated symptoms. ⁴

A new acronym of POLICE has been proposed to help conservative management of ankle sprains and other soft tissue injuries.⁹ POLICE stands for Protection, Optimal Loading, Ice, Compression and Elevation. Ice, compression and elevation are principles used in the early treatment of any grade of ankle sprain.

Protection does not mean casting and avoiding mobilisation, it is important to get the ankle moving early as possible with appropriate support.⁹ For more severe ankle sprains, walker boots can be used to encourage mobilisation with correct gait and reduce swelling. These should only be used in the short term (<10 days).⁴

Surgical intervention in the general population is reserved for those with grade three injuries or chronic ankle instability and have been unable to regain function or return to sport.⁴

Prevention

Due to high re-injury rate of ankle sprains and the risk of developing chronic ankle instability, it is important to consider how these injuries can be prevented. The use of footwear with ankle support, a brace or tape applied correctly has shown a reduction in recurrent lateral ankle sprain although the mechanism is not clear.⁴ A structured exercise program including balance and coordination activities can prevent recurrent ankle sprains.²

References

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