

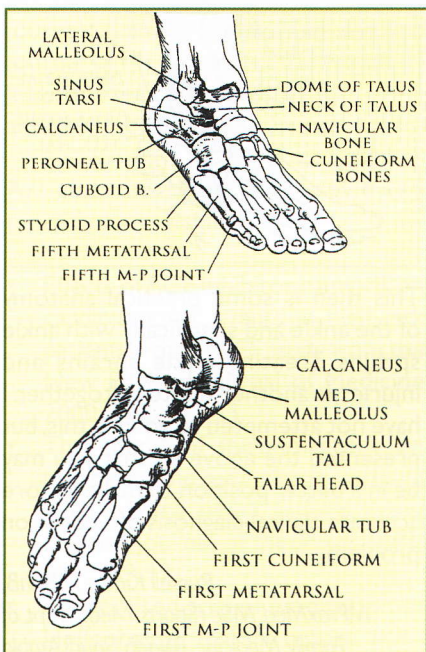
Practical Anatomy of the Ankle

In this article we are going to look at some practical aspects of the anatomy of the ankle because:

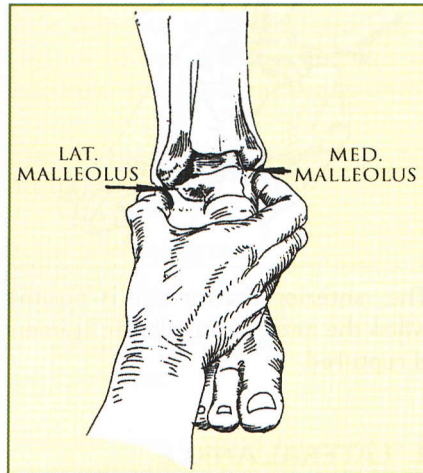
- Acute ankle sprains are the single most frequent specific injury in competitive or recreational activity and the lateral ligament complex is the most frequently injured single musculoskeletal structure in the body.
- Primary care practitioners can handle most ankle sprains.
- We need to recognise and select the more severe 10% that need to be treated elsewhere and to actively and adequately treat the 90% that we can.

Those who can remember the anatomy can skip this article but those who don't, might find the following sketches useful to add to your wall collection of "Alzheimer aids". By referring to them whilst examining the patient you can appear learned, and concerned with patient information, when your main aim is to check the anatomical reference points.

The following sketches are just to orientate ourselves and remind us of the basic bony anatomy of the foot and ankle. These are viewed from the lateral and medial aspects.



Note that the lateral malleolus extends further distally than the medial malleolus.



Some facts about ankle sprains

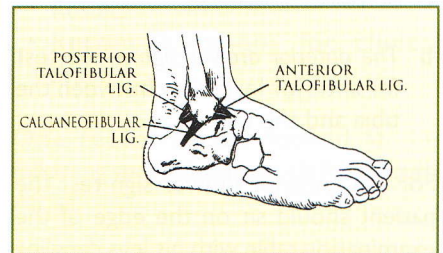
- 85% of ankle sprains follow excessive inversion and plantar flexion. This is for two anatomical reasons:
The medial malleolus is shorter than the lateral malleolus and the talus can thus be forced to invert farther than it can evert.
The ligamentous thickenings on the lateral side of the joint are separate and therefore not as strong as the massive deltoid ligament on the medial side.
Slight internal rotation accompanies the usual inversion and plantar flexion injury.
The anterior capsule ruptures first followed by the anterior talo-fibular ligament and the calcaneo-fibular ligament.
If total lateral disruption occurs the posterior talo-fibular ligament also tears.
- 15% follow excessive dorsiflexion and eversion.

THE THREE IMPORTANT LIGAMENTS OF THE LATERAL ASPECT OF THE ANKLE

The lateral collateral ligaments of the ankle joint are made up of three clinically important ligaments:

- a The anterior Talo-fibular ligament 4 o'clock
- b The Calcaneo-fibular ligament 6 o'clock
- c The posterior Talo-fibular ligament 8 o'clock

Note that they are not individually distinctly palpable and they are neither as strong nor as broad as the deltoid ligament.



- In inversion and plantar flexion the anterior Talo-fibular ligament is the first of the three lateral collateral ligaments to undergo stress. It runs from the anterior portion of the lateral malleolus to the lateral aspect of the talar neck. When sprained there is tenderness and swelling to be found but a defect does not become palpable.
- 40% of anterior talo-fibular ligament injuries are accompanied by calcaneo-fibular ligament injury.
- Except for the rare, pure inversion injury with the ankle in neutral position, the calcaneo-fibular ligament remains intact until the anterior talo-fibular ligament is torn.
- Lateral ligament injury can occur with an associated fibular or lateral malleolar fracture.
- Inversion injuries in the immature skeleton result in the distal fibular epiphysis possibly being injured without, or occasionally with, ligament injury. This is usually a Salter Harris type II injury. Thus in young athletes, any time you think there is a ligament injury, you should be X-raying to make sure you are not dealing with an epiphyseal or growth plate injury. This may also result in an avulsion injury.

Remember to x-ray the uninjured side for comparison.

TESTS FOR ANKLE JOINT STABILITY

I. THE ANTERIOR TALOFIBULAR LIGAMENT

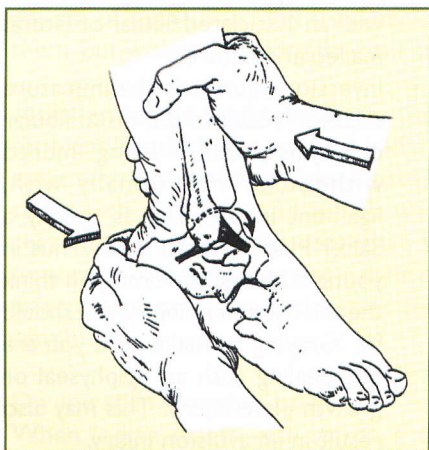
- a Turn the patient's foot into plantar flexion and inversion. If inversion stress increases his pain there is a distinct possibility that the ligament is sprained or torn.
- b *The anterior drawer sign is the test for anterior instability between the tibia and the talus.*

For the Anterior drawer sign test the patient should sit on the edge of the examination table with his legs dangling and his feet in a few degrees of plantar flexion. Place one hand on the anterior aspect of the lower tibia and grip the calcaneus in the palm of your other hand. Then draw the calcaneus and the talus anteriorly while pushing the tibia posteriorly.

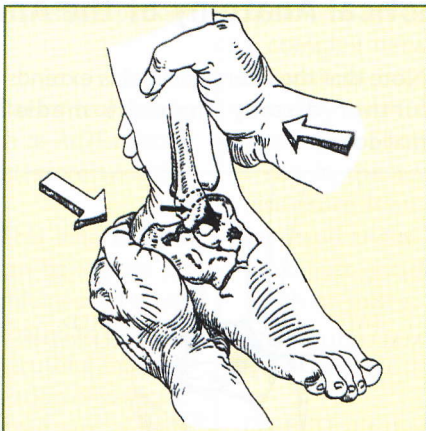
Normally the anterior talo-fibular ligament is tight in all positions of the ankle joint and there should be no forward movement of the talus on the tibia.

Under abnormal conditions the talus slides anteriorly from under the cover of the ankle mortise. One sometimes even feels a "clunk" as it moves.

THE ANTERIOR DRAWER TEST



A POSITIVE ANT. DRAWER SIGN



The anterior drawer sign is positive when the anterior talofibular ligament is ruptured.

2. LATERAL ANKLE

The anterior Talo-fibular and Calcaneo-fibular ligaments must both be torn to produce gross lateral ankle instability.

To check the integrity of these ligaments invert the calcaneus. If the talus gaps and rocks in the ankle mortise, the anterior talo-fibular and calcaneo-fibular ligaments are damaged with resultant lateral ankle instability.

The posterior talo-fibular ligament can be torn only in conjunction with the other lateral ligaments.

3. THE POSTERIOR TALOFIBULAR LIGAMENT

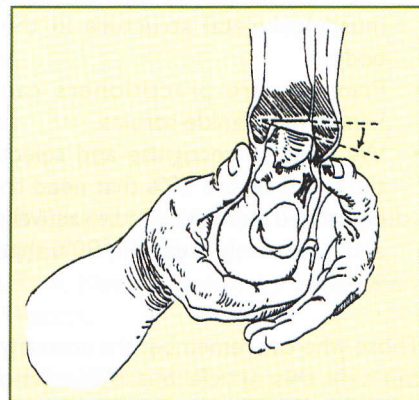
This takes origin from the posterior edge of the lateral malleolus and passes posteriorly to a small lateral tubercle on the posterior aspect of the talus. It is stronger than the two other collateral ligaments and its primary function is to prevent forward slippage of the fibula onto the talus. It is involved in only the most severe injuries to the ankle.

4. THE CALCANEOFIBULAR LIGAMENT

This stretches plantarwards to its insertion in the lateral wall of the calcaneus. In severe ankle sprains the ligament may be torn, but only after the

anterior talo-fibular ligament has also been torn. The loss of function of both these ligaments results in ankle instability.

A TEST TO EVALUATE THE STABILITY OF THE ANTERIOR TALOFIBULAR AND CALCANEOFIBULAR LIGAMENTS

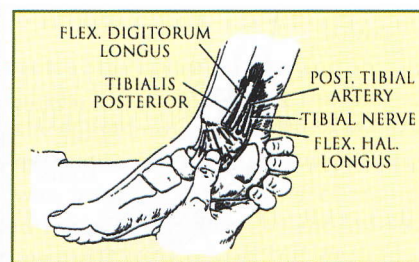


The ankle is unstable if both the anterior talo-fibular and calcaneo-fibular ligaments are torn.

5. THE ANTERIOR DELTOID LIGAMENT

The deep anterior deltoid ligament fibres can tear at the extreme of internal rotation and plantar flexion.

THE DELTOID LIGAMENT



This then is some practical anatomy of the ankle and specifically with ankle sprains. Treating ankle sprains and injuries is another matter altogether. I have not attempted to go into this, but presented the above so that you may be in a better position to make a more accurate clinical diagnosis of a common problem.

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