

Science Education Collection

Ankle Exam

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Overview

Source: Robert E. Sallis, MD. Kaiser Permanente, Fontana, California, USA

The ankle and foot provide the foundation for the body and the stability needed for upright posture and ambulation. Because of its weight-bearing function, the ankle joint is a common site of injury among athletes and in the general population. Ankle injuries occur as a result of both acute trauma and repetitive overuse (such as running). The ankle is a fairly simple joint, consisting of the articulation between the distal tibia and talus of the foot, along with the fibula on the lateral side. The ankle is supported by numerous ligaments, most notably the deltoid ligament on the medial side, and laterally by three lateral ligaments: the anterior talofibular ligament (ATFL), the calcaneofibular ligament (CFL), and the posterior talofibular ligament (PTFL).

Physical examination of the ankle and the patient history (including the mechanism of the injury and the location of pain) provide diagnostic information that helps the physician to pinpoint specific structures involved in an injury, and are essential for determining the severity of the injury and the subsequent diagnostic steps. When examining the ankle, it is important to closely compare the injured ankle to the uninvolved side. Essential components of the ankle exam include inspection, palpation, range of motion (ROM), and strength. In addition, special tests can assess the integrity of ligaments.

Procedure

1. Inspection

1. Inspect and compare both fully exposed ankles from the front, the side, and from behind looking for any asymmetry, as well as for swelling, ecchymosis, or arch deformities.
2. Inspect the patients' shoes for abnormal wear patterns, which can be seen in patients with flat feet or muscle and ligament injuries.

2. Palpation

Palpate for tenderness, swelling, or deformity in the lower leg, ankle, and foot using the tips of the index and middle fingers.

1. Lower leg palpation
 1. Start palpating along the entire tibia and fibula.
 2. Palpate in between the bones just above the ankle for the tibiofibular ligament and anterior compartment.
2. Ankle palpation
 1. Medial ankle: Palpate along the medial malleolus, deltoid ligament, and tibialis posterior tendon.
 2. Lateral ankle: Palpate along the lateral malleolus and three lateral ankle ligaments (ATFL, CFL, and PTFL) and the peroneal tendon, which courses around the lateral malleolus.
 3. Posterior ankle: Palpate along the Achilles tendon and its insertion on the calcaneus.
3. Foot palpation
 1. Palpate at the proximal fifth metatarsal and navicular bone, which are commonly injured during ankle trauma.

3. Range of Motion (ROM)

Ankle motion should first be assessed actively and then passively, comparing both ankles to look for asymmetry. Check for limited motion and/or pain.

1. To test the dorsiflexion, ask the patient to bend the ankle so the toes go up as far as possible. This motion is normally about 20°.
2. To test the plantar flexion, ask the patient to push the ankle so the toes go down as far as possible. This motion is normally about 50°.
3. Test the inversion by having the patient roll the bottom of their foot inward as far as possible. This motion is normally about 30°.
4. Test the eversion by having the patient roll the bottom of their foot outward as far as possible. This motion is normally about 10°.

4. Strength Testing

Ask the patient to repeat the same movements as when testing ROM while you apply resistance with your hand to prevent the movements. Test for the following while checking for muscle weakness and/or pain:

1. Resisted dorsiflexion: Stresses the tibialis anterior tendon and muscle.
2. Resisted plantar-flexion: Stresses the gastrocnemius, peroneal longus, tibialis posterior muscles and tendons.

3. Resisted eversion: Stresses the peroneal longus and brevis muscles and tendons.
4. Resisted inversion: Stresses the tibialis posterior and tibialis anterior muscles and tendons.

5. Special Tests

A variety of tests can be done on the ankle to assess integrity of the ankle ligaments and tendons. When doing these tests, check for evidence of laxity and/or pain.

1. Talar tilt test
Stabilize the patient's lower leg with one hand while cupping the heel with the other, and then invert the ankle joint. Inversion laxity compared to uninvolvement side suggests tearing of the lateral ligaments, while pain with this maneuver suggests ligament injury.
2. Anterior drawer test
Stabilize the patient's lower leg with one hand while cupping the heel with the other, and then pull forward on the calcaneus/talus complex. Laxity compared to the uninvolvement side suggests lateral ligament rupture.
3. Squeeze test
Squeeze the proximal tibia and fibula together while asking about pain distally at the ankle. Pain in the ankle suggests injury to the tibiofibular ligament (syndesmosis sprain). Rotating the ankle into external rotation will also aggravate pain from a syndesmosis injury.
4. Thompson test
Squeeze at the base of the calf muscle and look for ankle plantar-flexion. A lack of plantar flexion suggests a complete Achilles tendon rupture.

6. Functional tests

Ask the patient to perform the following sequential activities to see if they cause pain or other symptoms. These can be helpful in guiding an athlete's return to play or regular activity.

1. Walking
2. Standing/Walking on toes/heels
3. Squatting
4. Jogging
5. Running straight ahead
6. Running and cutting
7. Full speed running and cutting

Summary

Examination of the ankle is best done following a stepwise approach with the patient in a sitting position. It is important to have the patient remove enough clothing so that all surface anatomy can be seen and compared to the uninvolvement side. The exam should begin with inspection, looking for asymmetry between the involved and uninvolvement ankle. Palpation of key structures is done next, looking for tenderness, swelling, or deformity. This is followed by assessing ROM, first actively and then against resistance to assess strength. Pain with resisted motion suggests tendonitis, while weakness may indicate a tear. From there, a variety of special tests are performed to assess the ankle ligaments on the lateral and medial side of the ankle, along with the Achilles, peroneal, and posterior tibial tendons. Finally, functional tests can be done to evaluate the status of an existing ankle injury and facilitate return to play and activity.