

Department of Radiology Techniques

Radiological Position

The Second Stage



Ankle Joint

Lecture 9

Assist. Lecturer

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1- Antero-posterior – basic (Mortice projection)

Position of patient and cassette

- The patient is either supine or seated on the X-ray table with both legs extended.
- A pad may be placed under the knee for comfort.
- The affected ankle is supported in dorsiflexion by a firm 90-degree pad placed against the plantar aspect of the foot. The limb is rotated medially (approximately 20 degrees) until the medial and lateral malleoli are equidistant from the cassette.
- The lower edge of the cassette is positioned just below the plantar aspect of heel.
- cassette size(8x10 Inch) out – Bucky

Direction and centering of the X-ray beam

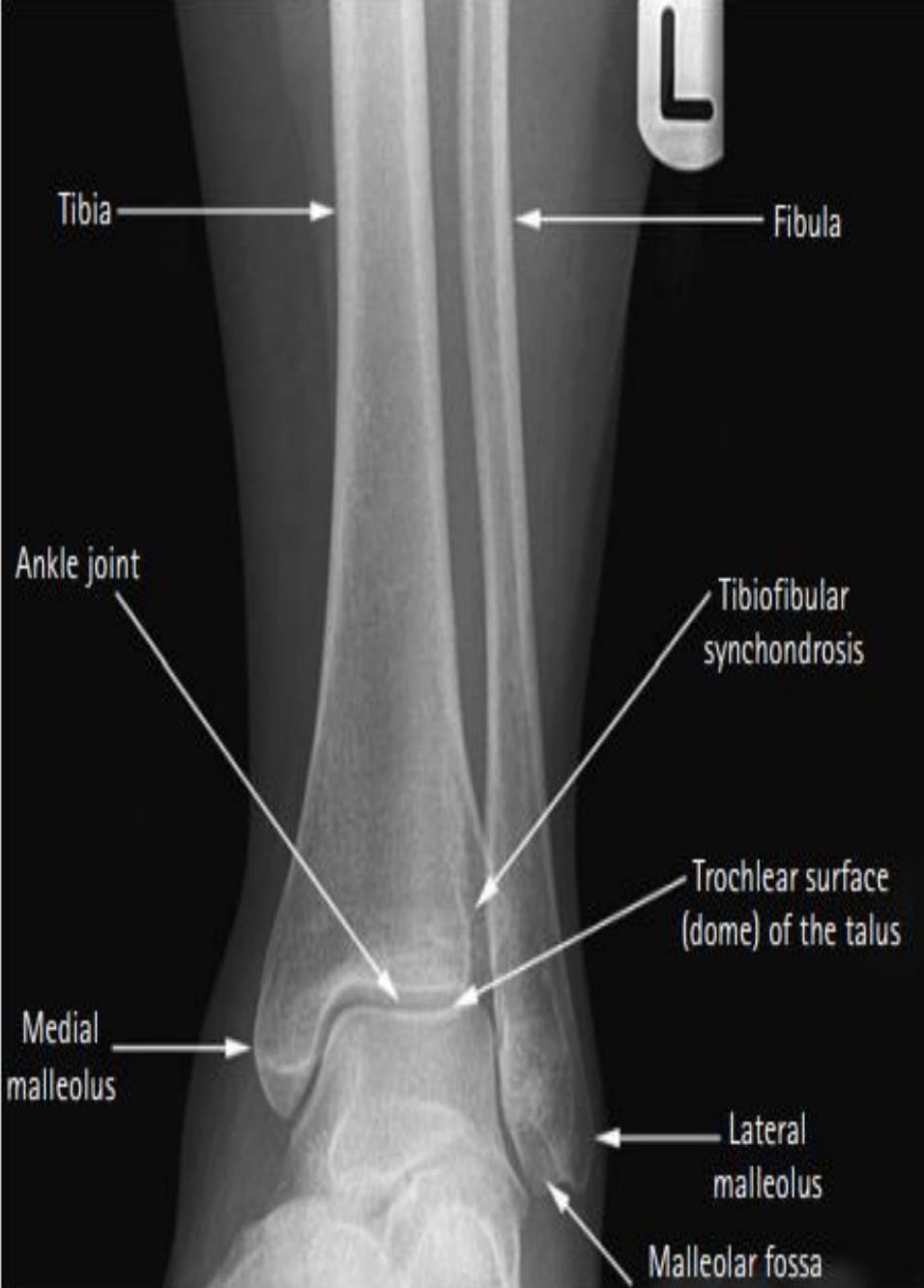
- Centre midway between the malleoli with the vertical central ray at 90 degrees to an imaginary line joining the malleoli.

Essential image characteristics

- The lower third of the tibia and fibula should be included.
- A clear joint space between the tibia, fibula and talus should be demonstrated (commonly called the Mortice view).

Common faults and remedies

- Insufficient dorsiflexion results in calcaneum being superimposed on the lateral malleolus.
- Insufficient medial rotation causes overshadowing of the tibiofibular joint with the result that the joint space between the fibula and talus is not demonstrated clearly.



Annotated antero-posterior radiograph



Normal antero-posterior radiograph of ankle



Insufficient medial rotation



Insufficient dorsiflexion

2- Lateral (basic) – Medio-lateral

Position of patient and cassette

- With the ankle dorsiflexed, the patient turns on to the affected side until the malleoli are superimposed vertically and the tibia is parallel to the cassette.
- A 15-degree pad is placed under the lateral border of the forefoot and a pad is placed under the knee for support. The lower edge of the cassette is positioned just below the plantar aspect of the heel.

Direction and centering of the X-ray beam

- Centre over the medial malleolus, with the central ray at right-angles to the axis of the tibia.

Essential image characteristics

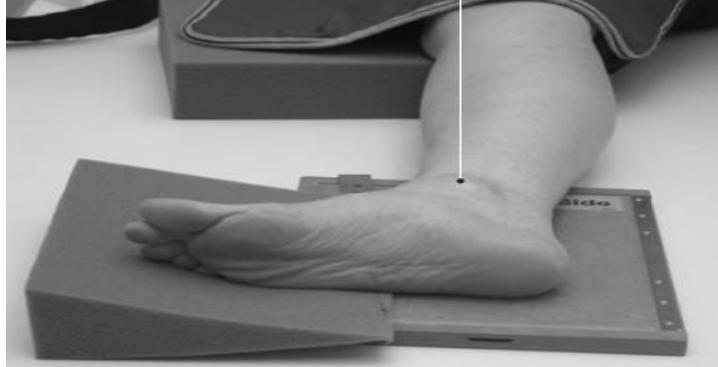
- The lower third of the tibia and fibula should be included.
- The medial and lateral borders of the trochlear articular surface of the talus should be superimposed on the image .

Common faults and remedies

- Over-rotation causes the fibula to be projected posterior to the tibia and the medial and lateral borders of the trochlear articulations are not superimposed.
- Under-rotation causes the shaft of the fibula to be superimposed on the tibia and the medial and lateral borders of the trochlear articulations are not superimposed.
- The base of the fifth metatarsal and the navicular bone should be included on the image to exclude fracture.



Annotated radiograph of lateral ankle



Normal lateral radiograph of ankle



Over rotation



Under rotation

3- Antero-Posterior (Alternative Projection)

Position of patient and cassette

- From the sitting position, whilst the patient is in a wheelchair, the whole limb is raised and supported on a stool and a pad is placed under the raised knee for support.
- The lower limb is rotated medially, approximately 20 degrees, until the medial and lateral malleoli are equidistant from the cassette. A non-opaque angled pad is placed against the medial border of the foot and sandbags are placed at each side of the leg for support.
- The lower edge of the cassette is placed just below the plantar aspect of the heel.

Direction and centering of the X-ray beam

- Centre midway between the malleoli, with the vertical central ray at 90 degrees to the imaginary line joining the malleoli or compensatory angulation of the beam if the foot is straight.

Note

If the foot remains straight, there will be overshadowing of the tibio-fibular joint combined with a vertical central ray.



Antero-posterior radiograph through plaster showing fracture of the distal fibula

4- Lateral (alternate) – lateral-medial

Position of patient and cassette

- With the patient maintaining the sitting position or lying on the trauma trolley, the limb is raised and supported on a firm non-opaque pad.
- A cassette is placed against the medial aspect of the limb. The lower edge of the cassette is placed just below the plantar aspect of the heel.

Direction and centering of the X-ray beam

- The horizontal central ray is directed to the lateral malleolus.



Horizontal beam lateral radiograph of ankle through plaster

Stress projections for subluxation

1- Antero-posterior – stress

Position of patient and cassette

- The patient and cassette are positioned for the routine anterior-posterior projection. The doctor in charge forcibly inverts the foot without integrally rotating the leg. •

Direction and centering of the X-ray beam

- Centre midway between the malleolus, with the central ray at right-angles to the imaginary line joining the malleoli.



Normal



Subluxation

Antero-posterior projection with inversion stress

2-Lateral – stress

Position of patient and cassette

- The patient lies supine on the table, with the limb extended.
- The foot is elevated and supported on a firm pad.
- The ankle is dorsiflexed and the limb rotated medially until the malleoli are equidistant from the tabletop.
- The film is supported vertically against the medial aspect of the foot.
- The doctor applies firm downward pressure on the lower leg.

Direction and centering of the X-ray beam

- Centre to the lateral malleoli with a horizontal beam.



Lateral projection with stress showing subluxation

Calcaneus Basic projections

1- Lateral – basic

Position of patient and cassette

- From the supine position, the patient rotates on to the affected side.
- The leg is rotated until the medial and lateral malleoli are superimposed vertically.
- A 15-degree pad is placed under the anterior aspect of the knee and the lateral border of the forefoot for support.
- The cassette is placed with the lower edge just below the plantar aspect of the heel.

Direction and centering of the X-ray beam

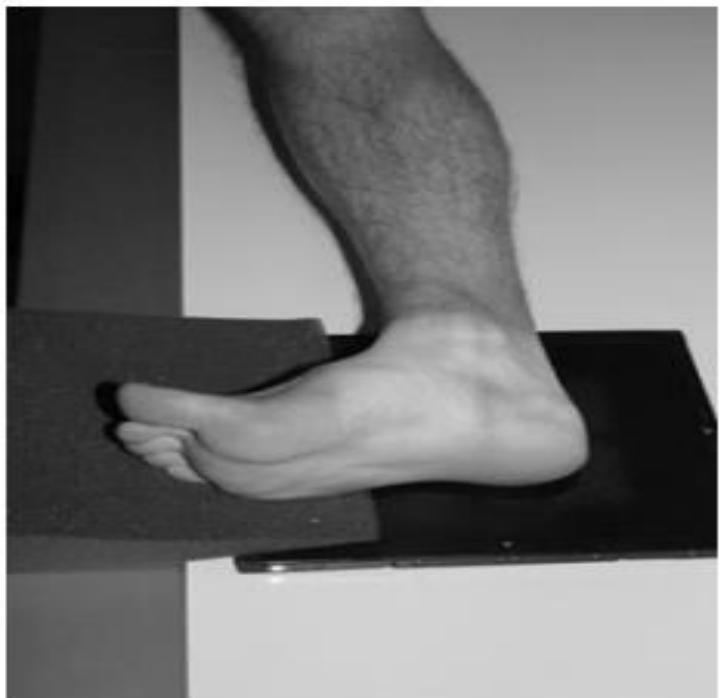
- Centre 2.5 cm distal to the medial malleolus, with the vertical central ray perpendicular to the cassette.

Essential image characteristics

- The adjacent tarsal bones should be included in the lateral projection, together with the ankle joint.

Note

This projection is used to demonstrate calcaneal spurs. For comparison, a radiograph of both heels in the lateral position may be necessary.



Normal lateral radiograph of calcaneum



Fracture of the calcaneum
Lateral radiographs of the calcaneum



Calcaneal spur

2- Axial – basic

Position of patient and cassette

- The patient sits or lies supine on the X-ray, table with both limbs extended.
- The affected leg is rotated medially until both malleoli are equidistant from the film.
- The ankle is dorsiflexed. The position is maintained by using a bandage strapped around the forefoot and held in position by the patient.
- The cassette is positioned with its lower edge just distal to the plantar aspect of heel.

Direction and centering of the X-ray beam

- Centre to the plantar aspect of the heel at the level of the tubercle of the fifth metatarsal.
- The central ray is directed cranially at an angle of 40 degrees to the plantar aspect of the heel.

Essential image characteristics

- The subtalar joint should be visible on the axial projection.



Normal axial projection of calcaneum



Axial projection of calcaneum showing comminuted fracture



Axial projection of calcaneum showing fracture

thanks