



Radiological anatomy



Sawa University

College of health and medical techniques

Department of Radiology

second stage

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Practical

كاظم رحمن أنمار.د: المادة استاذ

Radiological Anatomy of the Foot (Week 7)

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Learning Objectives

- • Understand detailed osseous anatomy of the foot on radiographs.
- • Identify anatomical landmarks on AP, lateral, and oblique views.
- • Recognize normal alignment patterns.
- • Interpret radiologic signs related to tarsal, metatarsal, and phalangeal structures.
- • Differentiate normal variants from pathology.

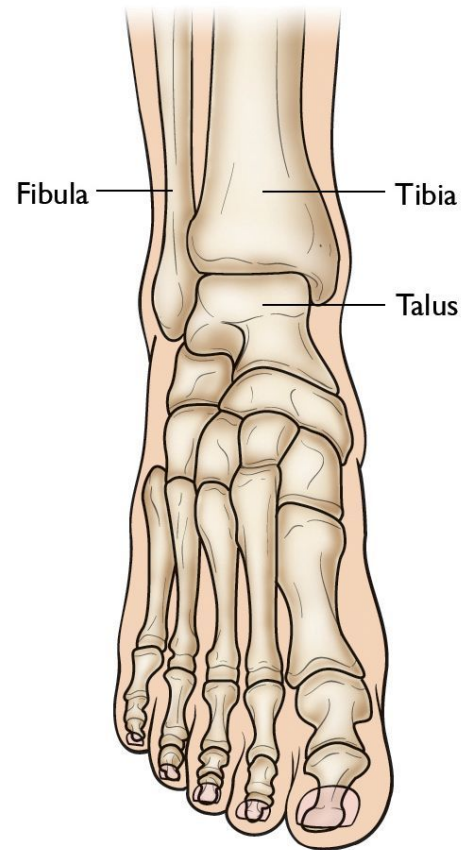
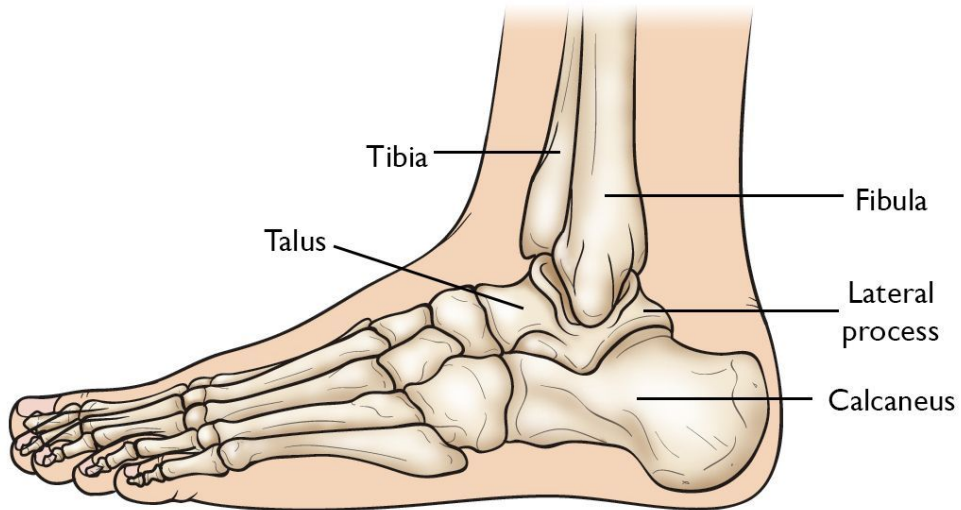
Osteology of the Foot: Overview

- • The foot contains 26 bones arranged into hindfoot, midfoot, and forefoot.
- • Hindfoot: talus and calcaneus.
- • Midfoot: navicular, cuboid, and three cuneiforms.
- • Forefoot: metatarsals and phalanges.
- • Radiological anatomy focuses on cortical outline, trabecular pattern, and joint congruency.

Talus: Radiological Anatomy

- • Key structures: talar dome, body, neck, trochlea.
- • Dome curvature must appear smooth; any irregularity suggests osteochondral lesion.
- • Subtalar joint space: uniform and well-defined.
- • Talar neck: common site for occult fractures

Talus



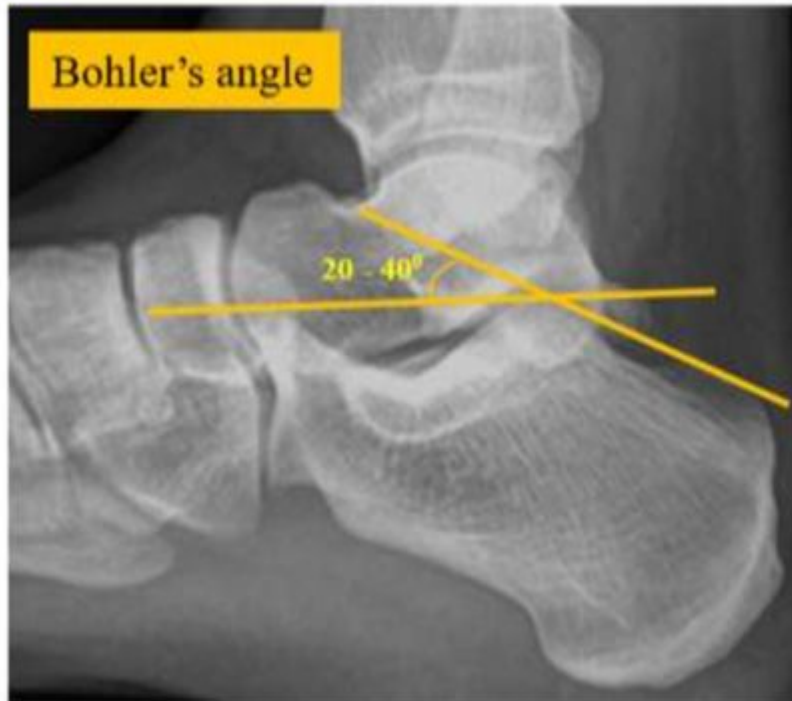
Talar fracture



Calcaneus: Radiographic Features

- • Assessed mainly on lateral and axial views.
- • Böhler's angle: normal 20–40°; decreased in calcaneal fractures.
- • Angle of Gissane: abnormality suggests compression injury.
- • Evaluate posterior facet, tuberosity, and sustentaculum tali.

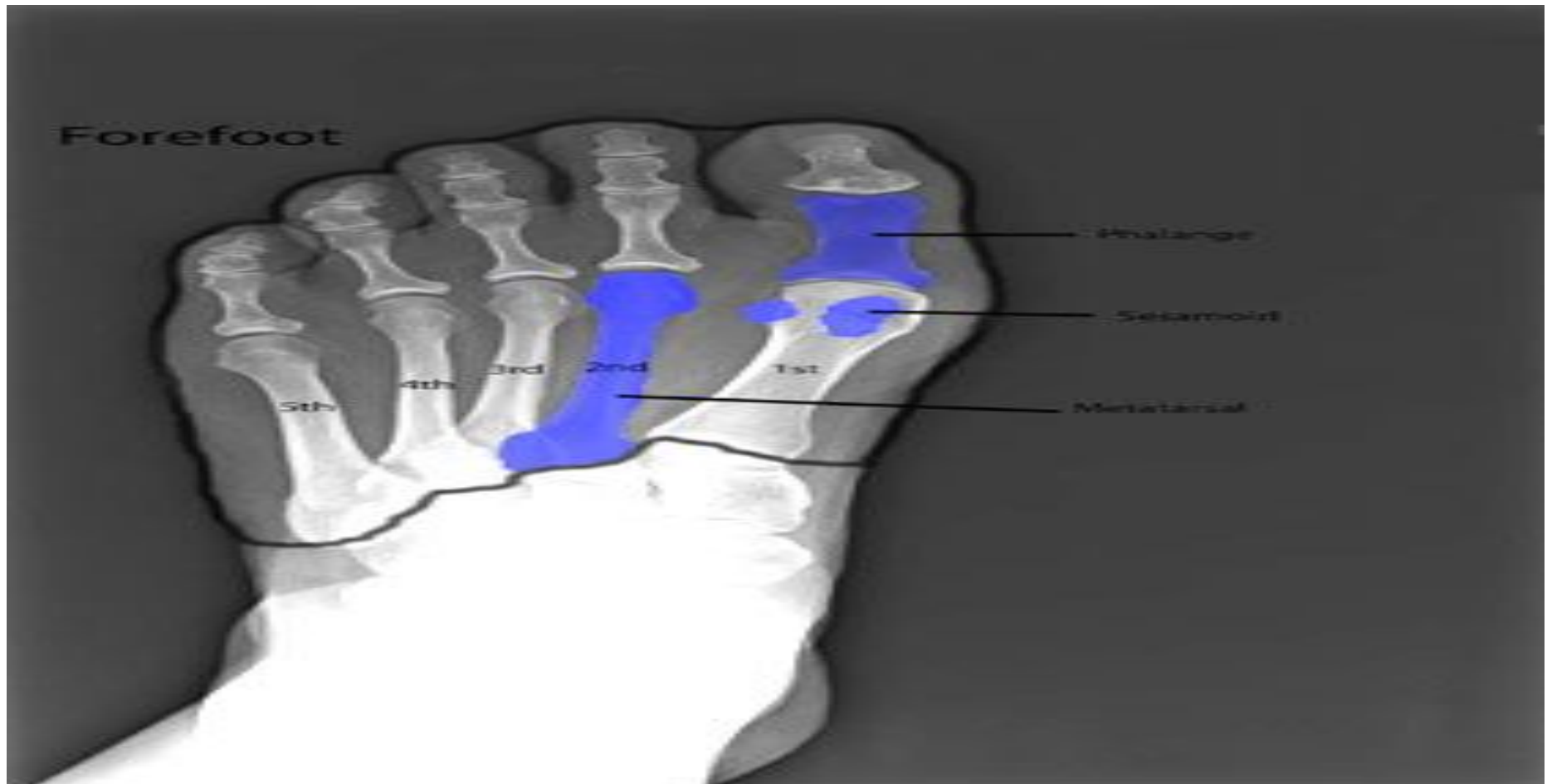
Calcaneus angles



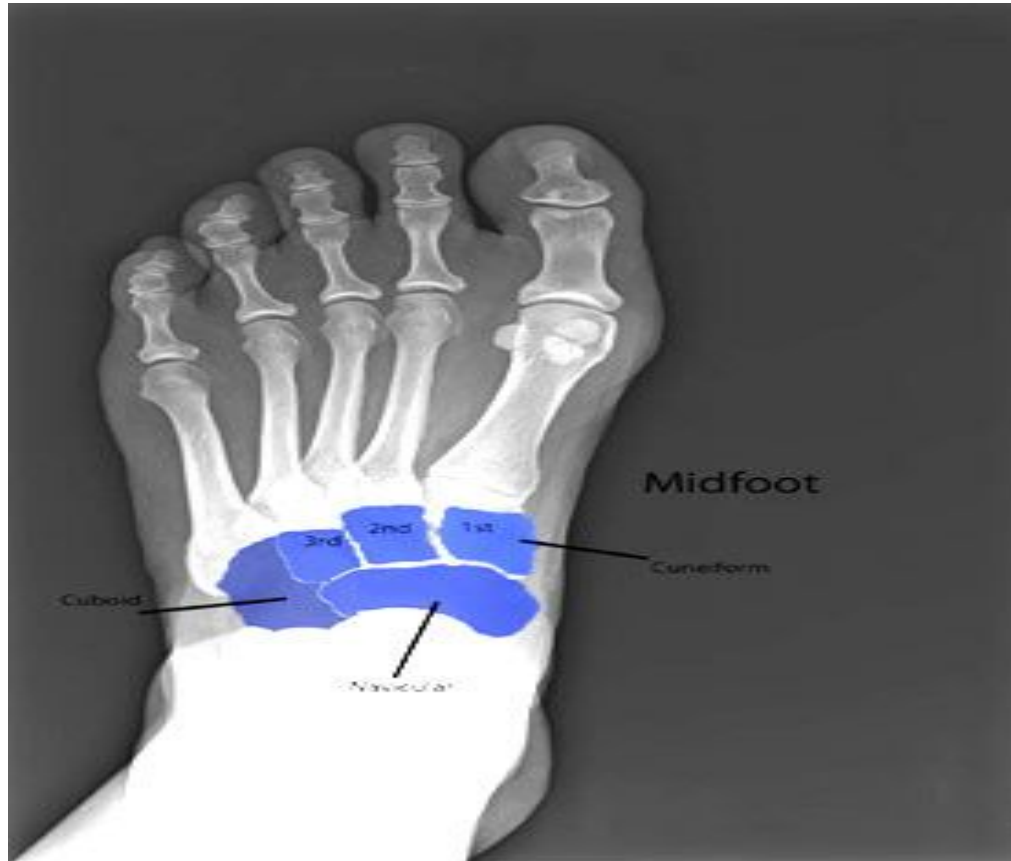
Midfoot: Navicular, Cuboid, Cuneiforms

- • Navicular: check talonavicular joint congruity.
- • Accessory navicular may mimic fracture.
- • Cuboid: critical for evaluating lateral column.
- • Cuneiforms: alignment with metatarsal bases is essential for Lisfranc stability.

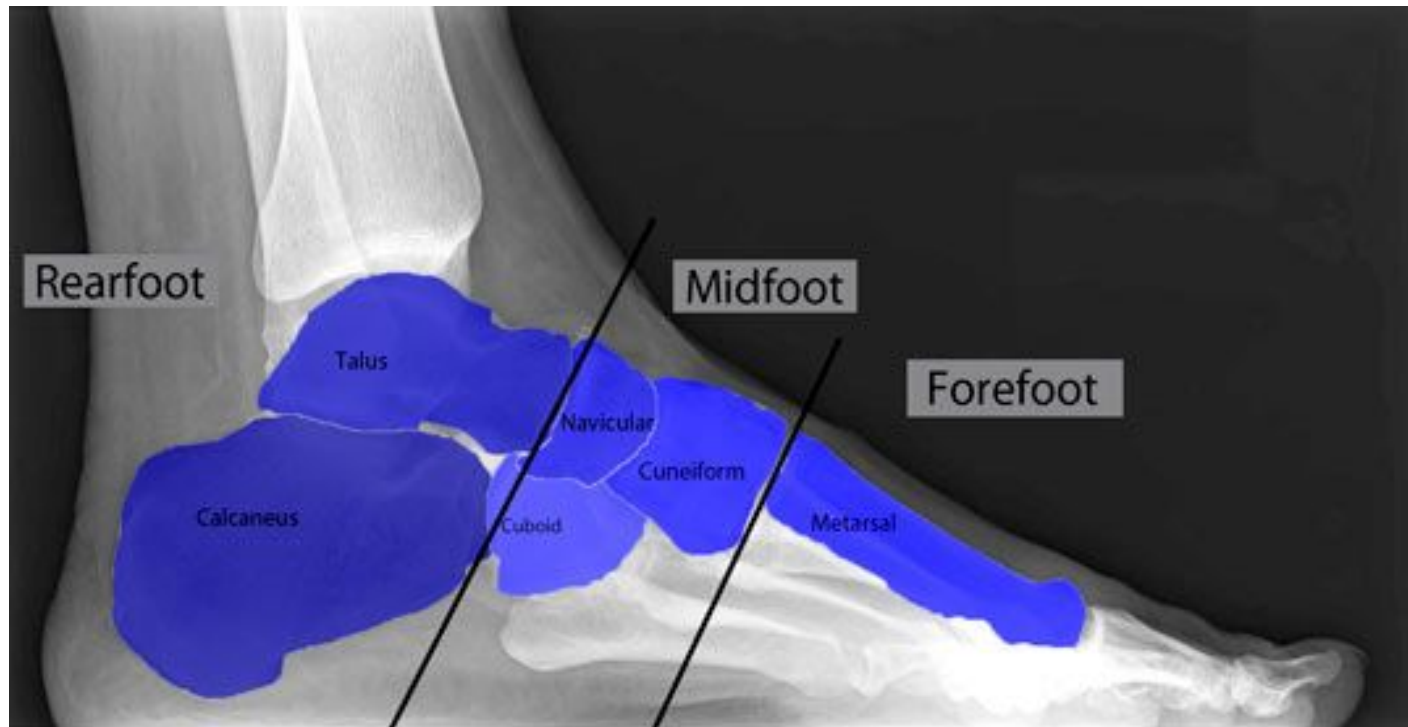
Forefoot



Midfoot



Foot regions



Lisfranc Joint Complex

- • Formed by tarsometatarsal articulations.
- • Alignment rules: medial border of 2nd metatarsal aligns with medial border of intermediate cuneiform.
- • Diastasis >2 mm between 1st and 2nd metatarsal bases suggests Lisfranc injury.

Lisfranc joint



Metatarsals: Radiologic Anatomy

- • Each metatarsal: base, shaft, neck, head.
- • 5th metatarsal base anatomy: differentiate avulsion vs Jones vs stress fracture.
- • Assess cortical continuity and joint spacing.

Phalanges: Detailed Radiologic Notes

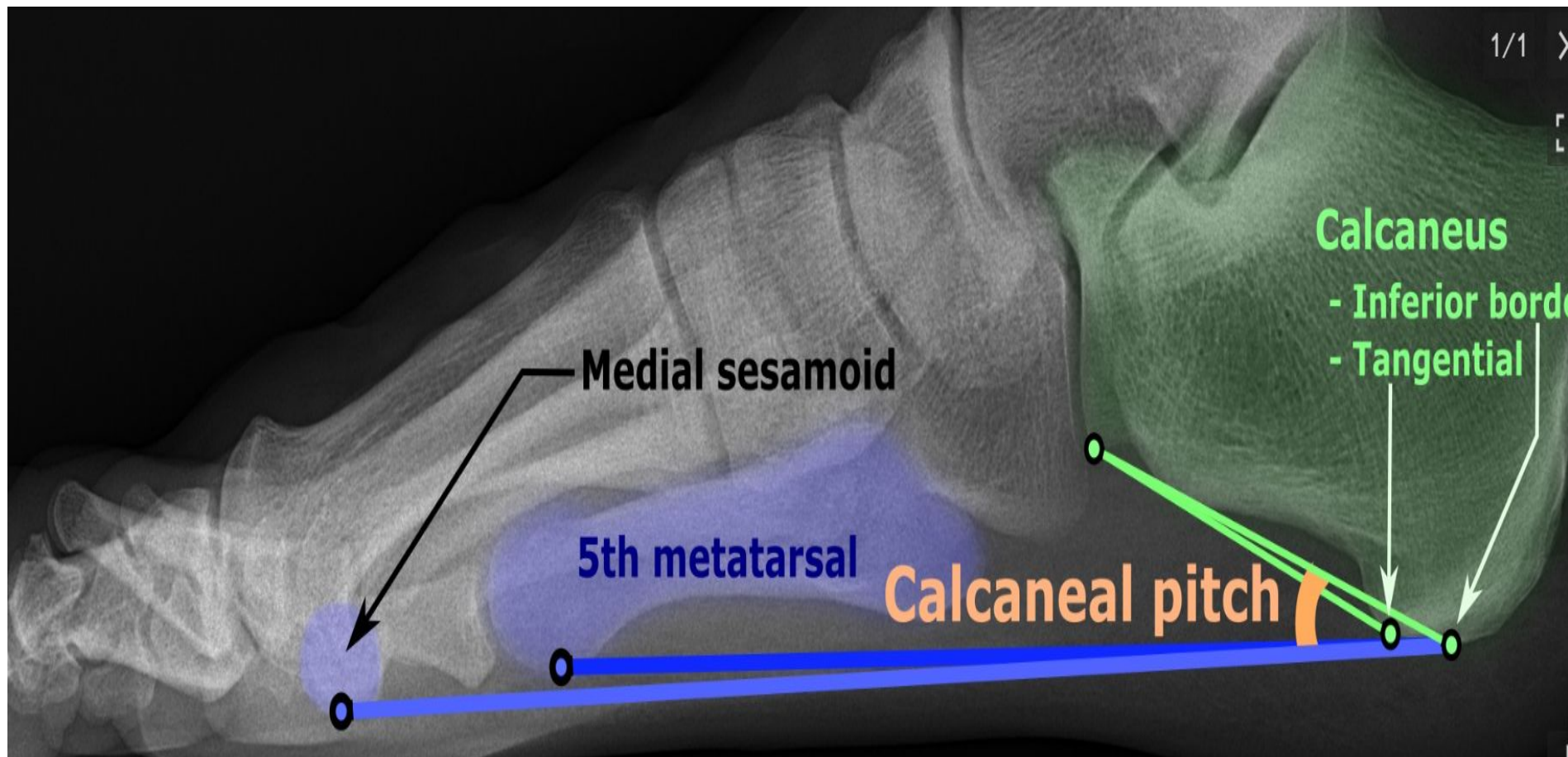
- • Hallux: two phalanges; others have three.
- • Evaluate interphalangeal joint spacing.
- •

Standard X-Ray Views

- • AP View:
 - – Evaluates forefoot alignment, metatarsal spacing.
 - – Identifies fractures of metatarsal shafts and bases.
- • Lateral View:
 - – Best for arches, calcaneus, talus, midfoot.
- • Oblique View:

Foot Arches: Radiological Assessment

- • Medial longitudinal arch assessed on lateral view.
- • Calcaneal pitch angle: increased in pes cavus, decreased in pes planus.
- • Meary's angle: talar–first metatarsal angle; should be nearly straight.



Pes clavus



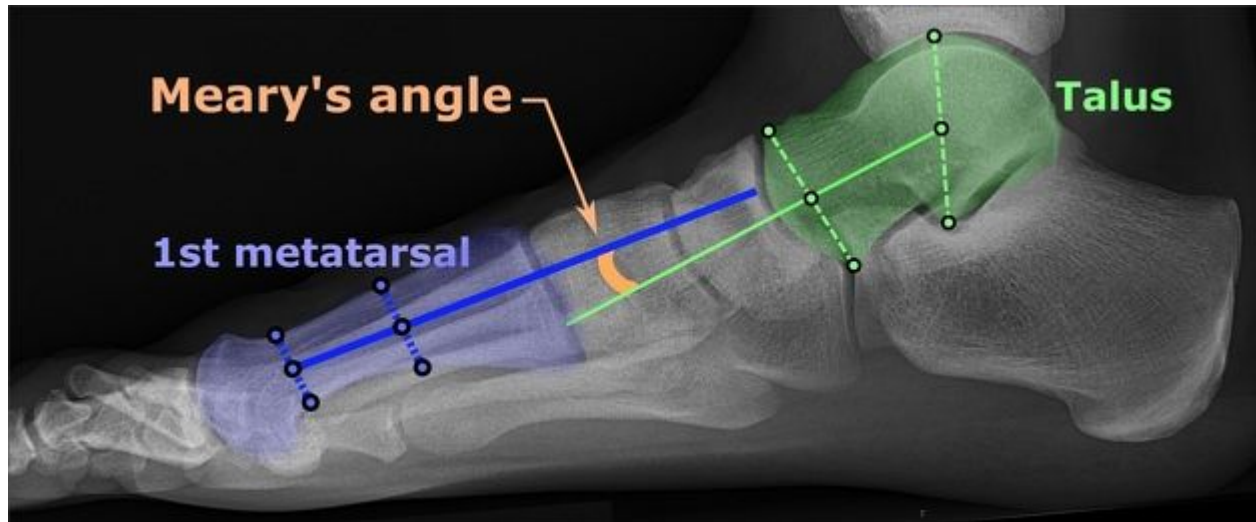
pes planus (flat foot)



Key Radiological Measurements

- • Böhler's angle.
- • Gissane's angle.
- • Meary's angle.
- • Calcaneal pitch.
- • TMT alignment lines for Lisfranc evaluation.

Meary angle



Common Foot Fractures

- • Calcaneal fractures: evaluate angles.
- • Talar neck fractures: assess vascular risk.
- • Jones fracture: metaphyseal-diaphyseal junction of 5th metatarsal.
- • Stress fractures: metatarsal shafts (march fractures).

Radiologic Signs of Soft Tissue Injury

- • Soft tissue swelling patterns indicate underlying injury.
- • Joint effusion suggests intra-articular fracture.
- • Plantar hematoma: strong indicator of calcaneal or midfoot fracture.

Radiological Red Flags

- • Loss of arch height.
- • Diastasis at Lisfranc joint.
- • Irregular talar dome surface.
- • Marked cortical disruption.
- • Misalignment of TMT or MTP joints.

Summary

- • Radiologic foot anatomy requires systematic evaluation.
- • Focus on alignment, cortical continuity, joint congruency, and key angles.
- • Identify normal anatomical variants.
- • Always correlate radiologic findings with clinical presentation.

References

- 1. Sectional Anatomy for Imaging Professionals – Kelley & Petersen.
- 2. Anatomy for Diagnostic Imaging – Ryan, McNicholas & Eustace.
- 3. Fundamentals of Sectional Anatomy – Lazo.
- 4. Musculoskeletal Imaging Texts for Radiologic Technology Programs.