Foot Deformities – A Pictorial Review

Naji Al-Khudairi, Catriona Reid, Fiona Witham and Kiruthika Chandrasekaran
Queen Alexandra Hospital, Portsmouth

Background
- The complex terminology associated with congenital and acquired foot deformities can lead to interpretation difficulty and challenges in plain radiography reporting.
- Such radiographs have value in providing a record of initial deformity, monitoring progression, and guiding treatment.
- Optimal radiographic interpretation demands accurate and standardised radiographic technique – ‘weight-bearing’ AP ankle, Lateral foot and ankle, and DP foot views are obtained.
- The aim of this pictorial review is to act as an aide-memoire or reference for the reporter interpreting plain radiographs on congenital and acquired foot deformities.

Terminology
- The complex terminology of foot deformities is best appreciated by understanding the movements at the main joints of the foot & ankle.
- Exaggeration of normal movements at these joints produces a fixed resultant deformity.
- Talipes refers to a congenital foot deformity. Pes refers to an acquired foot deformity.

Example Cases
- Collapsed of the longitudinal arch:
  Calcaneal Inclination angle (Cia) is the angle measured between the calcaneal inclination axis and the supporting horizontal surface. Normal 20-30°. Figure 1a. demonstrates an angle < 20° in pes planus. Meary’s angle (MEA) is the angle measured between a line drawn through the talus and calcaneus relative to the talus. Additionally, in this case there is an associated talo-calcaneal bony coalition.

  - Hindfoot equinus: Cia > 30° in pes cavus (Figure 2a).
  - Hindfoot varus: -Cia < 25° in pes planus (Figure 2b).

  - Forefoot adduction:
    Talocalcaneal angle (TcCa) is the angle measured between lines drawn down the axis of the talus and calcaneus. Normal 25-40°. Figure 1c. demonstrates an angle 50° in pes planus.

  - Forefoot abduction:
    Talonavicular coverage angle (TNCa) is the angle measured between lines connecting the articular surfaces of the talus and the navicular. It is a measure of lateral subluxation of the navicular on the talus. Normal < 7°. Figure 1d. demonstrates an angle 50° in pes planus.

  - High longitudinal arch:
    Talonavicular coverage angle (TNCa) is the angle measured between lines connecting the articular surfaces of the talus and the navicular. It is a measure of lateral subluxation of the navicular on the talus. Normal < 7°. Figure 1d. demonstrates an angle 50° in pes planus.

  - Hindfoot varus: -Cia < 25° in pes cavus (Figure 2b).

  - Pes Cavus:
    • TNCa normal in this case of pes cavus (Figure 2d).

  - Pes Planus:
    • High longitudinal arch:
      - Talonavicular coverage angle (TNCa) is the angle measured between lines connecting the articular surfaces of the talus and the navicular. It is a measure of lateral subluxation of the navicular on the talus. Normal < 7°. Figure 1d. demonstrates an angle 50° in pes planus.

  - Forefoot abduction:
    Talonavicular coverage angle (TNCa) is the angle measured between lines connecting the articular surfaces of the talus and the navicular. It is a measure of lateral subluxation of the navicular on the talus. Normal < 7°. Figure 1d. demonstrates an angle 50° in pes planus.

  - Forefoot adduction:
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References
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