In the evaluation of distal tibial deformities, one must consider the position of the talus, calcaneus, and foot relative to the tibia. The talus has a squared cross-sectional appearance in the frontal plane. The superior dome of the talus is parallel to the tibial plafond. There is normally no joint line convergence between the tibial plafond and the dome of the talus. This is different from the knee, where up to a 3° lack of parallelism between the femoral condyle line and the tibial plateau line (JLCA) is normal. The medial and lateral diaphyseal cortical lines intersect the talus laterally and medially, respectively, to the adjacent borders of the talus (Fig. 18-1 a). This normal relationship is important to know.

**Fig. 18-1 a, b**

a. The cortical lines of the tibia when extended distally fall within the body of the talus. The mid-diaphyseal line of the tibia is slightly medial to the midline of the talus.

b. When the distal tibia is resected, the body of the talus should be displaced medially (i) to avoid translating the foot laterally (ii).
The ankle joint axis of rotation passes through the tips of the MM and lateral malleolus. The axis is therefore neither in the frontal plane nor in the transverse plane. It is oriented from anterosuperior medially to posteroinferior laterally. The ankle axis is therefore not parallel to the plafond of the tibia or to the dome of the talus. The wedge shape of the talus is best likened to a section of a cone (frustum).

Normally, the mid-diaphyseal line of the tibia in the sagittal plane passes through the lateral process of the talus (center of rotation of the ankle joint) when the plantar aspect of the foot is 90° to the tibia. The plafond of the ankle is tilted forward (ADTA = 80°).

When considering fusion of the ankle after distal tibial resection (Fig. 18-1 b). The medial border of the talus will be medial to the medial cortex of the tibia. If the two are made collinear on the medial side, the heel will be laterally translated (Fig. 18-1 b).

In the sagittal plane, the articular surface of the talus is circular. Inman (Stiehl 1991) has shown that the three-dimensional shape of this surface is a frustum (section of a cone). Therefore, the axis of ankle rotation is not parallel to the joint line (Fig. 18-2). It normally runs from the tip of the MM to the tip of the lateral malleolus, passing through the lateral process of the talus. The center of rotation of the ankle can be approximated to the lateral process of the talus on the LAT view of the ankle (Fig. 18-3).

The calcaneus has an important orientation relative to the talus and tibia, especially in the frontal plane (Fig. 18-4 a). The long axis of the body of the calcaneus is inclined in the sagittal plane (calcaneal pitch). In the...