

THE RADIOLOGICAL INVESTIGATION OF THE TRAUMATIZED ANKLE

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The ankle is more frequently subject to fractures than any other part of the extremities. Despite this fact the radiographic examination of this joint is often inadequately performed. Anteroposterior and lateral views of the ankle are not infrequently regarded as sufficient for diagnosis. However, these two views alone will often lead to the failure of detection of abnormality.

With the recommended additional oblique view it is imperative that the entire lower limb be rotated medialwards for 45 degrees and that the foot be maintained at right angles to the leg.

In my experience even precise positioning in the 3 essential views of the ankle is not sufficient for the demonstration of small fractures in the regions of the distal ends of the malleoli. Minor avulsed fragments from the malleolar tips, often associated with collateral ligamentous tears (particularly of the external ligament in the adduction type of fracture), are not always shown in the 3 routine views. This is so because the shapes of the malleoli favour the concealment of small detached pieces of their cortices. I have found that a fourth view, which I have named 'the axial view of the ankle', provides valuable additional information about the tips of the malleoli.

The Axial View

The axial view is obtained as follows: The patient sits on the radiographic table. The foot is placed flat on the table with the knee bent so that the leg is at an angle of 130 degrees to the foot. The central ray of the X-ray beam is directed 5 degrees towards the heel with the centring point being between the two malleoli, at the level of the ankle joint (Fig. 1). With this view the malleoli, especially their tips, are seen tangentially. In addition, the medial margin of the head of the talus and the anterior aspect of the lateral margin of the calcaneus are well seen (Fig. 2).

Thus, the routine radiographic examination of the ankle, in our practice, consists of 4 views—anteroposterior, lateral, oblique, and axial—taken on one film, usually 15" x 12" in area. Fig. 3 demonstrates the avulsed fragment from the tip of the external malleolus; this is only visible in the axial view (A).

The axial view is of great value in differentiating the isolated independent ossification centres, which develop adjacent to the tips of the malleoli, from avulsed fragments of bone from these sites.

These ossification centres, the os subfibulare and the os subtibiale, may be of rounded or angular shape. Even

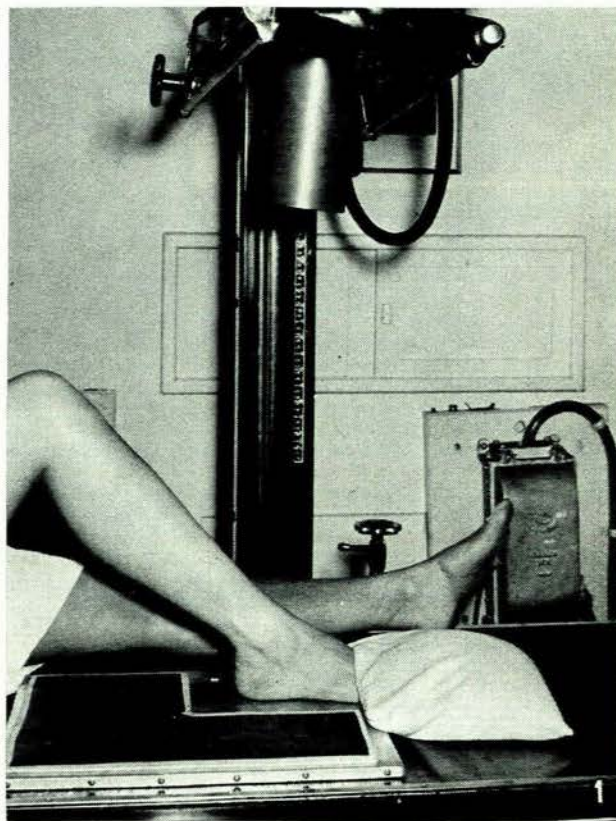


Fig. 1. See text.

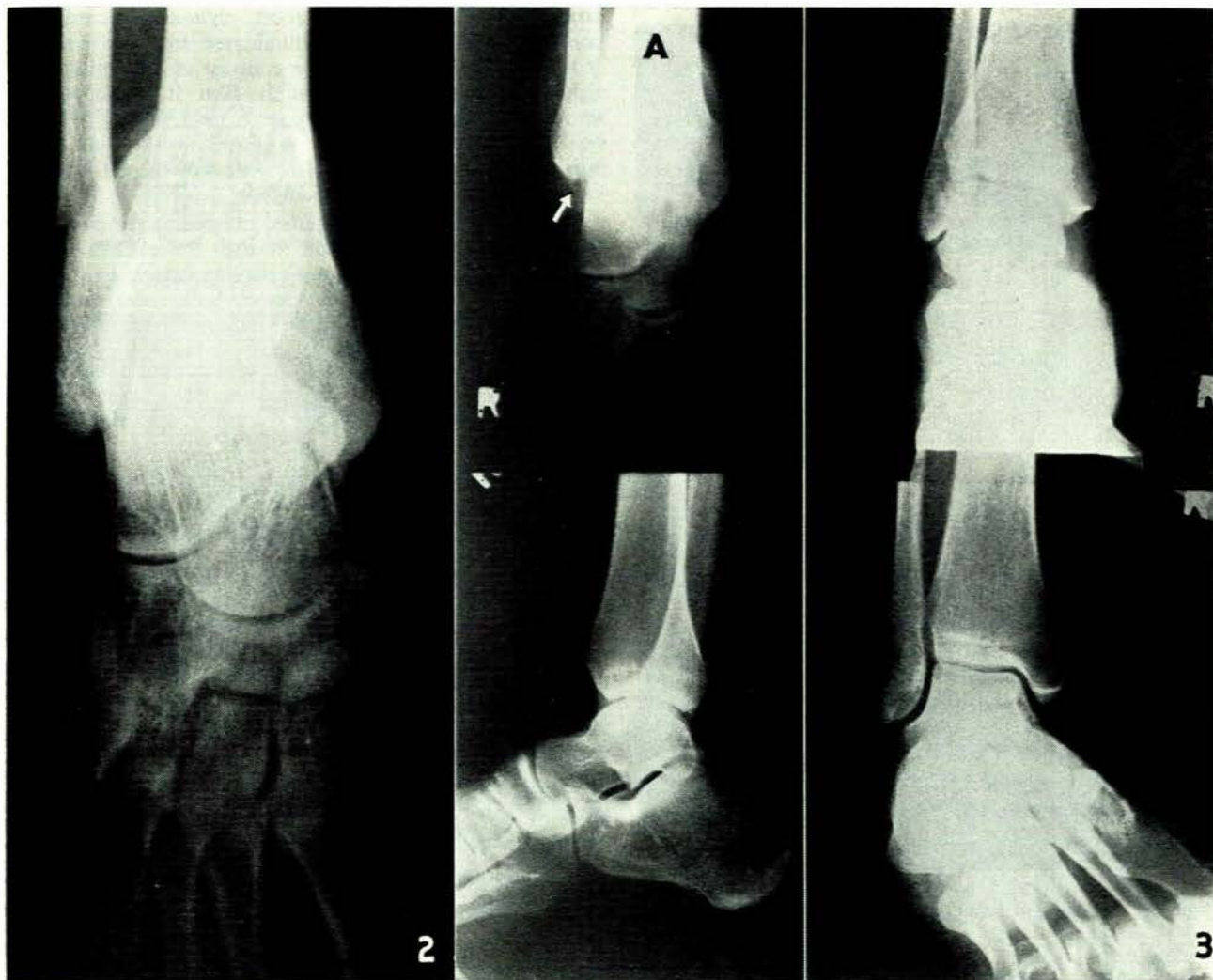
if they are multinucleate, as often happens, their margins and the contiguous surfaces of the malleoli are regular in outline.

Recently avulsed fragments of bone and their malleolar origins have irregular apposing surfaces. In old and ununited avulsions from the malleoli, although the fracture surfaces may become smooth, the axial view shows the localized flattening of the malleolar margins. This is easily appreciated when compared with the axial view of the opposite and normal ankle.

The discovery of avulsed fragments of the malleolar tips, apart from the need for precise diagnosis after recent trauma, may be of importance in medicolegal problems.

If doubt exists about an isolated fragment of bone distal to a malleolus, comparative views of the ankles may demonstrate bilateral osi subfibulare and osi subtibiale.

(Byvoegsel — Suid-Afrikaanse Tydskrif vir Radiologie)



Figs. 2 and 3. See text.

This is a quite common occurrence and assists in the diagnosis. Since adding the axial view to the radiographic investigation of the ankle, I and my partners have formed

the opinion that it is a *sine qua non*. Without this view doubt must remain about the integrity of the malleolar tips.