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Radiographic Evaluation

Introduction

In the opening paper Barriolhet describes a simple angular measurement for forefoot adduction that can evaluate adduction independently of supination.

In the first of two papers presented by Yamamoto and Furuya, the authors describe the relationship between their functional and radiographic results using the conventional Turco posterior medial release. They also describe two new angular measurements. In their second paper they report their more recent results using a modification of Turco's procedure and compare these results with those of the standard Turco procedure. The cases also were evaluated using their two new angular measurements as well as the conventional lateral tibiocalcaneal angle.

Stevens and Meyer use the talocalcaneal angle on the lateral intraoperative radiograph to assess the adequacy of operative correction of CTEV.

Kitada and colleagues describe the use of arthrography to assess the accuracy of (a) the angle between the talar body axis and the calcaneal axis and (b) the angle between the talar neck axis and the calcaneal axis. They compare these two angles to determine which is more closely associated with good functional results when measured on the standard AP radiograph.

The First Ray Angle

J. Barriolhet

Many radiographic measurements have been described for the evaluation of congenital clubfeet (CTEV).1–8 Recently an analysis of numerous radiographic measurements of the feet of children and adolescents has been published along with the normal ranges for various angles in clubfeet. In this study, three standard radiographic views were made of 74 infants and children and 11 angles were analyzed.9

The purpose of this paper is to present yet another angular measurement not described in the article by Vanderwilde et al.,9 which mea-
FIGURE 4.1. The technique of measurement of the first ray angle.

The first ray angle is the acute angle formed by the axis of the first metatarsal and the tangential line from the base of the first metatarsal to the base of the fifth metatarsal (Figure 4.1); therefore the name "first ray angle." An anteroposterior (AP) radiograph is taken with the x-ray tube placed vertically. Special attention is given to assure that all the metatarsal heads touch the cassette at the time of exposure.

To determine the normal range of measurement, the first ray angle was measured on the AP radiographs of 58 infants, children, and teenagers who were considered to have normal lower extremities. Half of the radiographs were obtained from films made previously and the other half were made for this purpose. The control patients were divided into six groups according to age (Figure 4.2). As in the study by Vanderwilde et al., data for both sexes were pooled for the analysis.

FIGURE 4.2. Distribution of normal control patients by age.