UNILATERAL HYPOPLASIA OF THE CALCANEUS ASSOCIATED WITH OTHER ABNORMALITIES. A NEW ENTITY ?

S. D. THEODOROU, C. BARTSOKAS

A 7-year-old boy followed since infancy for unilateral hypoplasia of the calcaneus is reported. In the present case, which seems to be the second in the literature, the hypoplasia of the calcaneus is similar to the one previously reported, but the involvement is unilateral. In addition, the child presents the following defects : a. absence of the fifth metatarsal, b. an ectrotic fifth toe, c. generalized hypoplasia of the foot and to a minor degree of the tibia, d. abnormalities of the ear lobes, upper lip, high arched palate, and e. a mild pectus excavatum. At the age of 7 years the child is of normal intelligence. He walks with a minimal limp as he has shortening of one centimeter and slight equinus on the affected side. Nevertheless he participates in all school activities and sports.

Keywords : calcaneus ; unilateral hypoplasia.
Mots-clés : calcanéum ; hypoplasie unilatérale.

INTRODUCTION

Hypoplasia of the calcaneus seems to be a rare anomaly. Bilateral hypoplasia of the calcaneus has previously been reported by Mehlman et al. (1) in a 2-month-old infant without any other concomitant defects. It was therefore considered appropriate to present a new case of unilateral hypoplasia of the calcaneus associated with other abnormalities.

CASE REPORT

A 45-day-old male infant was brought by his parents for examination because of abnormalities of his left foot. He was a first-born child. Family and obstetrical histories were unremarkable.

On clinical examination, the left foot was plantigrade, in slight valgus and hypoplastic in comparison to the healthy side. The tibia was also slightly hypoplastic, and the lateral malleolus prominent and in a posterior position. The characteristic finding was hypoplasia of the left calcaneus. The contour of the heel was abnormal, being curved, with a smaller posterior prominence of the calcaneus located in a higher than normal position and at a distance, from the sole of the foot. Absence of the fifth metatarsal and an ectrotic fifth toe were also noted (fig. 1).

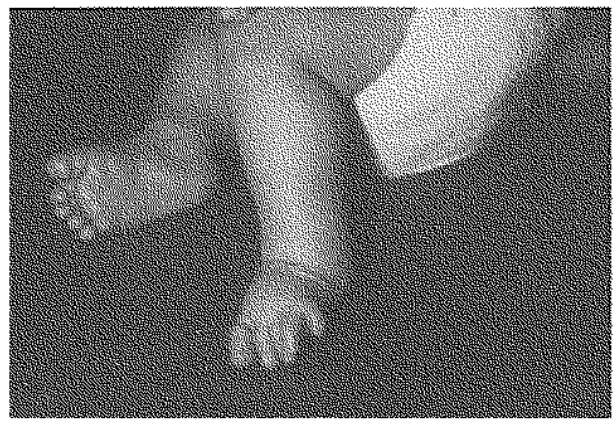

Fig. 1. - At the age of 1.5 months. The foot is hypoplastic and in slight equinus and valgus. Its posterior part is deformed. The heel is small and abnormal, lacking its normal contour. The posterior prominence is small and at a distance from the sole of the foot. The lateral malleolus is prominent posteriorly. There is also an ectrotic fifth toe.

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Radiographs at the age of 11 months showed considerable hypoplasia of the left calcaneus, which looked round rather than elongated, with a cup-shaped upper surface and a plantigrade position. The plantar border appeared more curved in comparison to the right side (fig. 2).

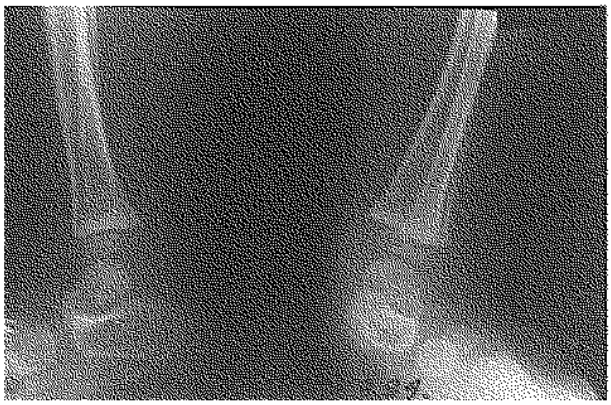

Fig. 2. — Lateral radiographs at the age of 11 months. The left hypoplastic calcaneus is more round than oblong in shape and its upper surface is cup shaped. The plantar border appears more curved in comparison to the right side.

The child was seen recently at the age of 7 years. He looked normal and presented no problems, except for a slight limp on the left side. He prefers to use tennis shoes and participates in all school activities and sports. Mobility of the ankle and foot were within normal limits. The lateral malleolus was prominent and posteriorly located. The left foot was hypoplastic as the tibia, which presented 1 cm of shortening. The fifth ectrotic toe presented no active mobility but caused no problems.

Anterioposterior radiographs of the feet showed hypoplasia of the tarsal and metatarsal bones, particularly of the fourth metatarsal and with complete absence of the fifth. The ectrotic fifth toe articulated with the lateral articular surface of the head of the fourth metatarsal (fig. 3).

In addition to the abnormalities of the lower extremity, the child presented abnormal configuration of both ear lobes which protrude anteriorly, longer upper lip with a long filtrum, and a high arched palate. There was also a mild degree of pectus excavatum (fig. 4). No abnormalities of the neck, trunk or the extremities were noted clinically.

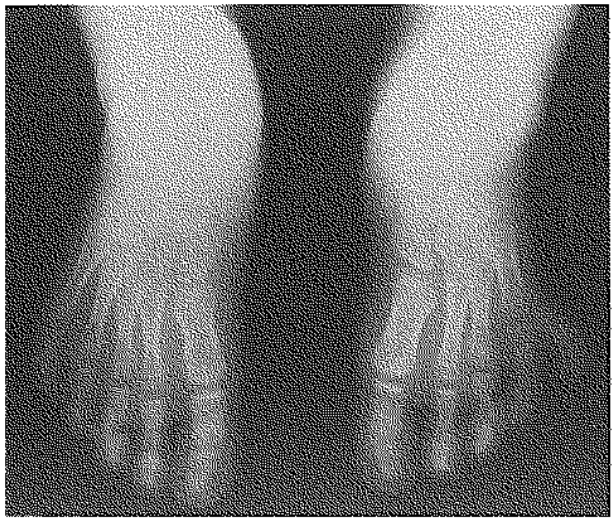

Fig. 3. — A-P radiographs of the feet at the age of 6.5 years. Mild hypoplasia of the tarsal bones and more pronounced of the fourth metatarsal, with absence of the fifth metatarsal on the left side. The ectrotic fifth toe articulates with the head of the fourth metatarsal.

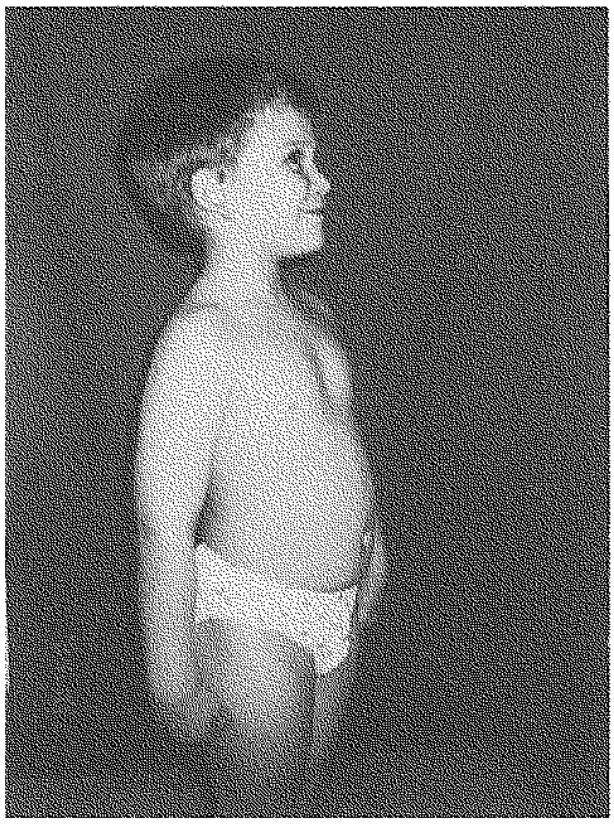

Fig. 4. — Photograph of the child at 6.5 years. Deformity of the ear lobes which protrude anteriorly, long upper lip with a long filtrum and pectus excavatum.

DISCUSSION

The congenital hypoplasia of the calcaneus which is the cardinal characteristic in the case presented in this paper, is similar to the one previously reported (1), except for the unilateral involvement. Nevertheless our case presents in addition, the following anomalies :

a. Absence of the fifth metararsal, b. an ectrotic fifth toe, c. Hypoplasia of the foot and, to a minor degree, of the ipsilateral tibia, d. additional abnormalities involving the ears, the upper lip with a high arched palate and e. mild pectus excavatum.

Mehlman and associates (1) postulated that the abnormality of the calcaneus may be due either to abnormal suppression of the primary ossification centers, or to an earlier error, it may be related to the programed cell death associated with calcaneal chondrification.

The existence of other concomitant defects of the foot unilaterally resulting in more extended dysplasia, and the other associated deformities most likely could be attributed to a harmful factor acting during the embryogenic stage of development.

The findings do not appear to conform with any recognizable hereditary syndrome (2). A caryotype was normal and there was no parental consanguinity, factors which could have contributed genetically.

It will be useful to review similar observations in the future, to confirm or exclude a causal relationship between hypoplasia of the calcaneus and the facial and sternal anomalies.

The child does not present any problems, except for the shortening of the tibia, which may progress until completion of growth to more than 2 or 3 cm, in which case lengthening will be required.

REFERENCES

1. Mehlman C. T., Dickens D. R. V., Menelaus M. Bilateral Hypoplastic Calcanei. J. Ped. Orthop., 1991, 11, 384-385.
2. McKusick V. A. Mendelian inheritance in man. 9th ed. Johns Hopkins University Press, 1993.

SAMENVATTING

S. D. THEODOROU, C. BARTSOKAS. Unilaterale hypoplasie van de calcaneus geassocieerd met andere afwijkingen. Een nieuwe entiteit ?

Beschrijving van het geval van een 7-jarig kind gevolgd voor unilaterale hypoplasie van de calcaneus. Dit zou een tweede gelijkaardig in de literatuur beschreven geval zijn maar de aantasting is hier unilateraal en het kind lijdt aan geassocieerde afwijkingen :
a. afwezigheid van metatarsaal V
b. ectrotisch 5° teen
c. algemene hypoplasie van de voet en in mindere mate van het onderbeen
d. afwijkingen van de oorlellen, bovenlip, gehemelte
e. een lichte graad van pectus excavatum.
Op 7-jarige leeftijd heeft het kind een normale intelligentie. Het hinkt zeer licht, heeft een ongelijke beenlengte van 1 cm en een lichte equinus aan de aangetaste zijde. Hij kan aan alle school- en sportactiviteiten deelnemen.

RÉSUMÉ

S. D. THEODOROU, C. BARTSOKAS. Hypoplasie unilatérale du calcaneum associée à d'autres malformations. Une nouvelle entité ?

Nous présentons un cas d'hypoplasie du calcanéum chez un garçon âgé de sept ans, suivi depuis l'âge de 45 jours. Dans ce cas, qui paraît être le second cas publié, l'hypoplasie du calcaneum est semblable à l'autre déjà publié, mais la localisation est unilatérale et il présente en plus, les anomalies suivantes : a. Absence du cinquième métatarsien, b. Cinquième orteil ectrotique, c. Hypoplasie généralisée du pied et moins sévère de la jambe, d. Anomalies des oreilles, de la lèvre supérieure, palais ogival et pectus excavatum léger. À l'âge de sept ans, l'enfant marche avec une légère claudication. Il présente un raccourcissement d'un cm de la jambe, mais il participe a toutes les activités scolaires et aux sports.