

IDIOPATHIC SYMMETRICAL SHORTENING OF THE FOURTH AND FIFTH METACARPAL AND METATARSAL BILATERALLY A CASE REPORT

J. M. KIRKOS

A case of idiopathic bilateral symmetrical shortening of the fourth and fifth metacarpal and metatarsal bones in an active 10-year-old Caucasian female is described. The deformity did not result from trauma or an endocrine disorder and it was not hereditary. The function of the hands and feet was normal, and the only discomfort was of a cosmetic nature. Metacarpal or metatarsal lengthening therefore seemed unnecessary.

Keywords : short metacarpal ; short metatarsal ; brachymetacarpia ; brachymetatarsia.

Mots-clés : briéveté métacarpienne ; brachymétacarpie ; briéveté métatarsienne ; brachymétatarsie.

INTRODUCTION

Shortening of metacarpals or metatarsals which is not due to trauma, endocrine disorder (pseudohypoparathyroidism) and is not hereditary is uncommon, and the coexistence in the same patient is extremely rare.

Most of the reported cases are due to trauma (2, 4, 6) while some are idiopathically related to the metatarsals (10). In all but a few cases there is a combination of a short metacarpal and metatarsal, and only one reported case had bilateral symmetrical shortening of the fourth metacarpal and metatarsal (3).

CASE REPORT

An active 10-year-old Caucasian female came for consultation because of shortening of the fourth and fifth finger and toe bilaterally. Her

height was 147 cm and her weight was 39 kg. Moreover her general appearance and intellect were normal, while there were no problems with her vision.

There was no history of trauma. Since early childhood she had noticed that her hands and feet were different from those of other people ; her parents knew of no one in the family who had a similar condition.

Her parents, her older sister and her three living grandparents had normal hands and feet both clinically and radiologically.

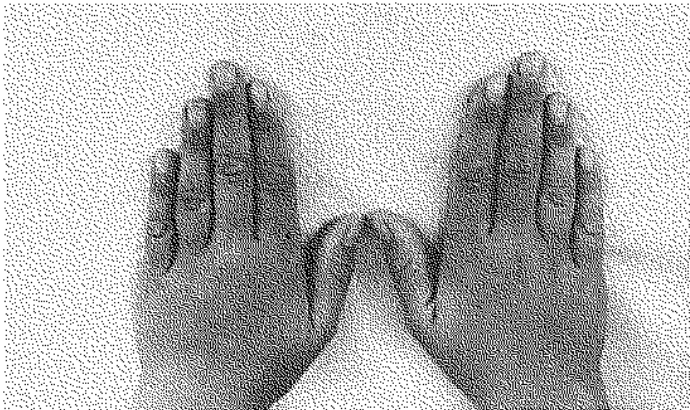
There was shortening of the fourth and fifth finger (fig. 1a) and toe (fig. 3) bilaterally at first glance (brachydactyly), but further examination revealed that the shortening was located in the metacarpals and metatarsals respectively.

The movements and function of the hands and feet were normal, as were the movements of the wrist, subtalar and ankle joints. There were no callosities or ulcers on the sole or on the dorsal part of the foot. The condition of the girl's hands and feet caused no discomfort. Moreover the movements and function of the major joints (shoulders, elbows, hips and knees) were absolutely normal.

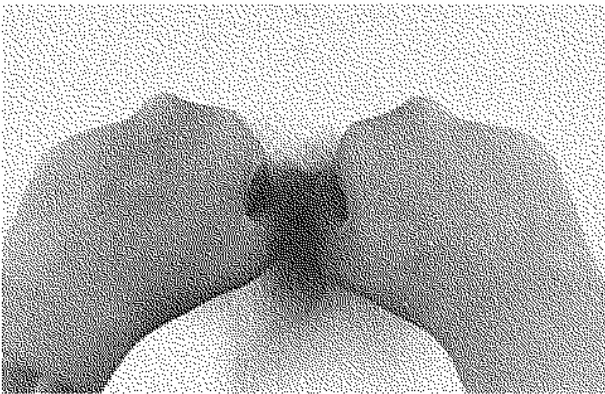
During full flexion of the fingers the head of the fourth and fifth metacarpal protruded lower

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a



b

Fig. 1. — *a.* Clinical appearance of the shortening of the fourth and fifth finger bilaterally. *b.* On flexion the knuckles of the fourth and fifth metacarpal are depressed.

and more proximally than the others (fig. 1b). Radiological examination showed bilateral symmetrical shortening of the fourth and fifth metacarpal (fig. 2) and metatarsal bones (fig. 4), with slight relative lengthening of the phalanges of the fingers and toes, respectively. A premature physcal arrest of the fourth and fifth metacarpals and of the fourth metatarsal was noted, while the epiphyseal plate of the fifth metatarsal was active but the metatarsal bone itself was relatively short. There were no other abnormalities of the hands or feet.

Urine and blood test results including calcium, phosphorus, parathormone, thyroxin, thyrotropin stimulating hormone (TSH) and sedimentation rate were normal.

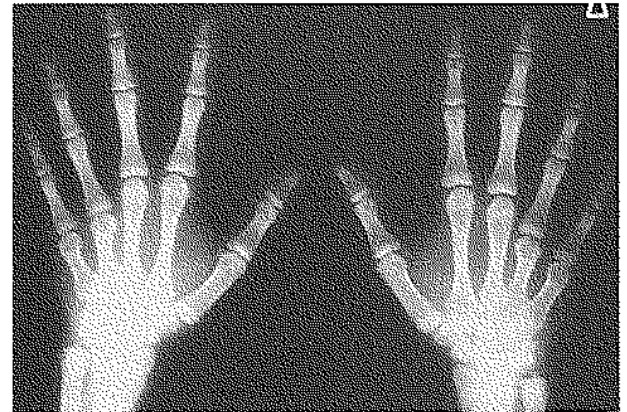


Fig. 2. — Roentgenograms show shortening of the fourth and fifth metacarpal as well as premature closure of the metacarpal epiphyseal plates. Note the slight relative lengthening of the phalanges respectively.



Fig. 3. — Clinical appearance of both feet. There is shortening of the fourth and fifth toe bilaterally.

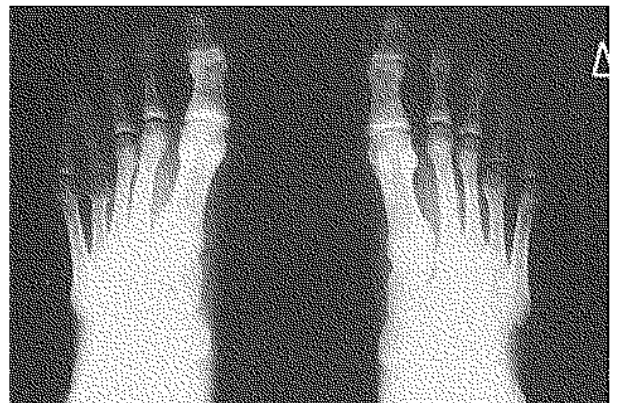


Fig. 4. — Roentgenograms show shortening of the fourth and fifth metatarsal bilaterally.

The only problem according to the patient was the appearance of the feet, especially the left one, particularly as she walked barefoot on the beach.

DISCUSSION

Congenital shortening of a metacarpal or a metatarsal bone has previously been termed brachydactyly, which is defined as shortening of the fingers or toes (3). Short fourth metatarsals are uncommon among the population in most countries. In Japan, however, the incidence is 0.022% (13).

In such cases the length of the phalanges is normal or slightly longer than normal, but the toe appears to be shorter at first glance because of the metatarsal shortening.

The deformity is seen particularly in females and it usually affects the fourth metacarpal or metatarsal after the age of four years. The hereditary character of the deformity was established in five families (13).

Trauma is the most common cause of the deformity, but it can also be seen in cases of pseudohypoparathyroidism (8), pseudopseudohypoparathyroidism (5, 9), neurofibromatosis or congenital adrenal hyperplasia due to 11-beta-hydroxylase deficiency (1).

Pseudohypoparathyroidism was excluded due to normal biochemical results, while pseudopseudohypoparathyroidism (PPHP) was excluded because the girl had neither short stature nor heterotopic calcifications or cataracts (5, 9, 12). Moreover, the phalanges of the fourth and fifth finger were not shorter, as is usually the case in PPHP (5), but slightly longer than usual, and none of her relatives, as far as they knew, had any metabolic disorder of calcium or parathormone. The response of the patient to exogenous parathormone was not tested.

A number of surgical techniques have been described for lengthening a short metacarpal or metatarsal (6, 7, 10, 11, 13). Urano and Kobayashi described a large series of 46 patients who were treated by lengthening of the fourth metatarsal (13). They performed variations of Jinnaka's bone-lengthening method, interposing a spindle-shaped bone graft within the metatarsophalangeal

joint. The patients with a pseudarthrosis usually had no pain on walking, but patients with solid fusion of the graft after bone-lengthening usually complained of difficulty in running or walking on tiptoe.

The afore mentioned patient and her parents were fully informed, and it was suggested that nothing be done especially to the left foot, lest some degree of function be sacrificed for the sake of cosmetic appearance.

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SAMENVATTING

J. M. KIRKOS. Ideopatische en symmetrische verkorting van de vierde en vijfde metacarpaal en metatarsaal.

Een gezond 10-jarig blank meisje met symmetrische verkorting van de vierde en vijfde metacarpaal en metatarsaal wordt beschreven. Er was geen trauma noch endocriene afwijking aanwezig en de afwijking was niet erfelijk. De hand en voetfunctie was normaal; de enige hinder was cosmetisch. Er werd dan ook afgezien van verlengingsprocedures.

RÉSUMÉ

J. M. KIRKOS. Briéveté idiopathique bilatérale des quatrième et cinquième métacarpiens et métatarsiens. Présentation d'un cas.

L'auteur présente un cas de briéveté symétrique idiopathique des 4^{ème} et 5^{ème} métacarpiens et métatarsiens chez une fille de race blanche âgée de 10 ans. La déformation n'était pas d'origine endocrinienne, héréditaire ou traumatique. La fonction des mains et des pieds était normale; la seule gêne était de nature esthétique. Par conséquent, un allongement des métacarpiens et des métatarsiens n'a pas été jugé nécessaire.