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ScienceDirect
The Foot 17 (2007) 45–49
The Foot
www.elsevierhealth.com/journals/foot

Case report

You, the great toe of this assembly?

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Abstract

We report a case of unilateral pre-axial polydactyly of metatarsal type which was incompletely managed. Our patient was a 5-year-old boy with a primary first ray (M1) which was distally short and not making the metatarsophalangeal joint. In addition, there was a proximally hypoplastic lateral accessory ray forming the metatarsophalangeal joint. There was some involvement of the first tarsometatarsal joint. Clinically, there was no leg-length discrepancy or any evidence of anterolateral tibial bowing. The management involved reconstruction of the first ray by fusing the primary M1 with the accessory metatarsal. Furthermore, a subsequent lengthening SCARF osteotomy with bone grafting was also used to normalize the contour of the growing foot. The importance of knowledge of epiphyseal anatomy of the foot in planning the surgical management of such cases cannot be over-emphasized.

Keywords: Bifid hallux; Prehallux; Scarf osteotomy; Ephiphysis

A 5-year-old boy presented to our clinic with painful left foot. Apparently, he had six toes and one of them, on the medial side had been taken off a year previously in Iran.

On clinical examination, he had a fully mobile foot. He had a rudimentary big toe, which was about a centimeter shorter than the second toe. There was a bony prominence on the medial side, which appeared to be a greatly enlarged distal end of first metatarsal. The scar on the medial side was quite supple and mobile (Fig. 1).

Clinically, there was no evidence of leg-length discrepancy or anterolateral bowing of ipsilateral tibia. The contra lateral side was normally developed. The child was born after a full-term normal pregnancy. There was no family history of any similar or other skeletal deformity.

Radiography disclosed multiple abnormalities in the region of the first metatarsal. There was, what appeared to be a short but normally formed first metatarsal with a proximal growth plate, but falling short of contributing in the formation of the first metatarsophalangeal joint. Laterally, there was an accessory metatarsal which failed to develop proximally but was forming the joint; it had a distal growth plate. The medial cuneiform and first tarsometatarsal joint were abnormal (Fig. 2). The proximal epiphysis of the primary M1 seemed to be degenerate as well.

Refashioning of the distal end of the first metatarsal was undertaken. Excision of the distal end of the short metatarsal and fusion of the cut ends of bone was performed to make a new distal end of the first metatarsal. The short and accessory first rays were fixed internally using a seven hole tubular plate (2.7 mm) (Fig. 3) The first tarsometatarsal joint was found to be subluxed with abnormal articular surfaces and reduction and fixation of this joint was achieved using a K-wire. Strict non-weight bearing mobilization was allowed for 6 weeks.

At 7 weeks, all the metal-ware was removed. The post-operative course was complicated by a minor wound infection which was treated with oral antibiotics.

At 6 months follow-up, the patient was mobilizing pain-free. At 1.5-year follow-up, he was completely asymptomatic. Two-year follow-up radiographs showed satisfactory healing of bones (Fig. 4). However, the first metatarsal was short and it was decided to perform a lengthening procedure.

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0958-2592/$ – see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.foot.2006.09.004

Fig. 1. *Left*: A short left great toe with a medial bony prominence. *Right*: Lateral profile showing the scar of previous surgery.

At about 2.5 years from the primary procedure, a lengthening SCARF osteotomy with cancellous bone graft (harvested from iliac crest) was performed. The osteotomy was fixed with one screw which was removed 2 months afterwards. Post-operative radiographs showed good length achievement (Fig. 5). At the last follow-up, the patient was completely asymptomatic and his big toe was well corrected (Fig. 6).

Fig. 2. Anteroposterior radiograph of left foot, showing a short, normally formed rudimentary metatarsal; laterally there is an accessory metatarsal with a distal growth plate. Also note the abnormal medial cuneiform and first tarsometarsal joint.

1. Discussion

Menenius:	What do you think,
	You, the great toe of this assembly?
[First] Citizen:	I, the great toe? Why the great toe?
Menenius:	For that, being one o'th'lowest, basest, poorest
	Of this most wise rebellion, thou goest foremost.

Coriolanus: Act 1 Sc.1 45–9

Shakespeare made good use of "*the great toe*" to insult the Plebians in their revolt against the Patricians, in the famous analogy of '*the belly*' employed by Menenius Agrippa. The great toe does have some peculiar features that make it 'lack its champion' [17] and thus stand out of the assembly it constitutes.

The pre-axial polydactyly, i.e. supernumerary toes on the medial side of the foot involving the first ray can be grossly classified into pre-hallux and bifid hallux.

Kidner [1] used the term *pre-hallux* to describe an enlarged scaphoid (navicular) bone associated with an accessory navicular bone. The tibialis posterior tendon was attached to the pre-hallux, which was ascribed to as the cause of flat foot. Later on Cobey and Cobey [2] described the first reported case of pre-hallux. According to them the term *pre-hallux* should only be employed in describing an entire great toe arising from the scaphoid (navicular) bone. In their case, there was a true articulation of a two-phalanx great toe with the medial border of the navicular, which was treated by amputation. The presence of such an appendage in our patient is a matter of conjecture only as we did not have any documentation before he had this removed.

The other spectrum of deformity is *bifid hallux*. The term has been in use for a deformity involving the first ray and the great toe itself. Venn-Watson, [3] classified their 65 patients