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Correction of a Forefoot Deformity Caused by a Large, Solitary Metatarsal Osteochondroma in an Adolescent: A Case Report

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ABSTRACT

Solitary osteochondroma is the most common bone tumor, accounting for 20% to 50% of all benign bony tumors. Osteochondromas are usually found on the metaphysis of the long bones near the physis; the bones of the foot are less commonly involved. We describe a 13-year-old female with a large osteochondroma arising from the fourth metatarsal. Pressure from the tumor on the adjacent metatarsals had deformed her forefoot, creating cosmetic and functional problems. The second and third toes were deviated laterally at the metatarsophalangeal joint, and the fourth and fifth toes were deviated medially. In addition, the fourth and fifth toes were flexed at the proximal interphalangeal joint. We excised the osteochondroma and stabilized the metatarsophalangeal joints. After 3 years, the cosmetic and functional results were satisfactory. The subluxation at the metatarsophalangeal joints had resolved without treatment. Her Revised Foot Function Index score had improved from 141 preoperatively to 95 postoperatively, and her Manchester-Oxford Foot Questionnaire score had improved from 25 to 0. This case is a rare example of a large metatarsal osteochondroma in a growing child in which pressure from the tumor caused secondary forefoot deformities. The management of this case also shows the potential for the forefoot to remodel itself during adolescence, after the tumor has been resected and the joints stabilized.

Osteochondroma is one of the most common benign tumors or tumor-like lesions of bone, and it is the most common benign cartilaginous bone tumor (1). The tumor appears to be a developmental defect, rather than a true neoplasm, and is commonly referred to as an *exostosis* or *osteocartilaginous exostosis* (1). It can occur in any bone that develops from preformed cartilage (enchondral ossification).

Osteochondromas can be solitary or multiple. Multiple tumors are associated with a syndrome termed *hereditary multiple exostoses* (1). Solitary tumors constitute 20% to 50% of all benign bony tumors (2). The tumor has a male/female ratio of 2.5:1 (3), and most tumors are found during rapid skeletal growth (4). They are usually found on the metaphysis of a long bone near the physis, most often on the distal femur, proximal tibia, or proximal humerus (4). Solitary osteochondromas in the foot or hand are less common (1), and very few cases of metatarsal osteochondroma have been described in adolescents.

We report an unusual case of an osteochondroma arising from the fourth metatarsal in an adolescent female. She sought treatment because the associated forefoot deformities were creating cosmetic and functional problems.

Case Report

A 13-year-old female came to us in January 2011 with multiple deformities on her left forefoot involving the second, third, fourth, and fifth toes (Fig. 1). She had noticed the deformities 4 to 5 years earlier, but they had progressed slowly. However, they had increased to such an extent that they now bothered her functionally and cosmetically. She reported mild-to-moderate pain with running and was unable to participate in sports. She also had difficulty wearing regular footwear.

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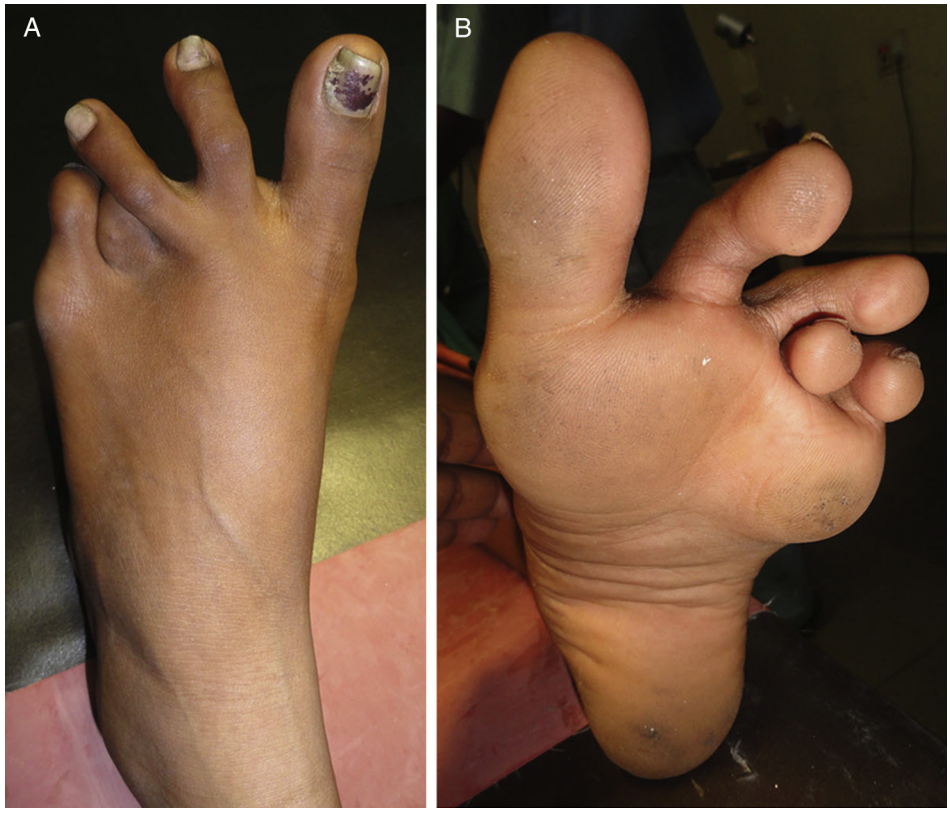

Fig. 1. (*A* and *B*) Clinical photographs showing the deformity due to an osteochondroma on the left foot of a 13-year-old female. The second and third toes were deviated laterally, and the fourth and fifth toes were deviated medially at the metatarsophalangeal joints.

Fig. 2. (*A*) Anteroposterior and (*B*) lateral radiographs of the left foot demonstrating the osteochondroma as a large, pedunculated exostotic tumor arising from the medial border of the midshaft of fourth metatarsal. Pressure from the tumor on the adjacent lateral cortex of the third metatarsal midshaft created a resorptive scalloping deformity. The distal aspect of the fourth metatarsal showed a marked lateral deformity. The fourth metatarsophalangeal joint was dislocated and the third subluxated.