Surgical Management of a Rare Central Ray Polydactyly: A Case Report

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LEARNING OBJECTIVE

To present a unique surgical approach for a case of central ray polydactyly.

LITERATURE REVIEW

Polydactyly is a developmental disorder characterized by the presence of supernumerary digits, often associated with other genetic disorders but can be isolated as well. It most frequently is inherited in autosomal dominant fashion as an isolated trait (1). Polydactyly can be classified as pre-axial, post-axial, or central ray duplication depending on the involved duplicated bones, as well as based on anatomic shape of the involved metatarsal. Central polydactyly is the least common form (2).

CASE STUDY

A healthy three-year-old male presented with his mother to the office after the mother noticed an antalgic gait favoring the right foot with decreased activity. The patient has no past medical history, no relevant family history, and had an otherwise normal birth. Upon physical exam, a painful bony prominence was noted in the sub-metatarsal head four region along with an abnormal, wide appearance of the fifth toe and nail plate. Clinically the width of the right foot was only slightly greater than the patient’s normal left foot. Radiographic imaging revealed a bifid or Y-shaped fourth metatarsal with duplication of proximal and distal phalanx within the fifth toe (Figure 2). The medial arm was directed plantarily corresponding with the painful bony prominence and likely due to overcrowding, and this plantar directional growth likely contributed to the lack of significant increased width of the forefoot. The lateral arm was abducted directly laterally. Contralateral foot physical and radiographic exam was normal.

A z-shaped incision was made extending from the fourth interspace distally through the medial nail plate (Figure 3). The decision was made to preserve the medial arm and resect the lateral arm of the bifid fourth metatarsal with a sagittal saw, as this would more easily preserve normal anatomic alignment and contour, as well as function at the fourth metatarsophalangeal joint (MTPJ). In order to restore anatomic alignment of the metatarsal parabola and fourth MTPJ, a dorsiflexory wedge osteotomy was performed in the shaft of the remaining deformed, plantarflexed fourth metatarsal with percutaneous pin fixation with immediate resolution of bony prominence appreciated (Figures 3 and 4). A Winograd procedure was incorporated at the distal end of the incision through the abnormal medial fifth toenail in combination with excision of supernumerary phalanges within the fifth toe (Figures 3 and 4). Patient was followed closely postoperatively with pin pulled and return to asymptomatic, normal activity at four weeks. Two-month follow-up showed clinical osseous union with evidence of bone callus at the osteotomy site seen in figure 4; patient continued with normal asymptomatic activity.

REFERENCES