

## Rare Presentation of Foot Postaxial Polydactyly

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### ABSTRACT

Polydactyly is a prevalent birth anomaly observed in the foot, and a number of classification systems have been suggested for this condition. Postaxial (fifth or little toe) polydactyly is the most common type. We encountered an exceedingly rare presentation of foot postaxial polydactyly that, to our inspection, had neither been previously classified nor described in published studies. In the present report, we have described an otherwise healthy 2-year-old female who had presented to our clinic with an isolated, extra little toe on her left foot. Foot radiographs revealed the presence of all 5 metatarsals; however, the fifth metatarsal was blocked and did not give rise to the fifth toe. Instead, the fifth (medial normal) and sixth (lateral extra) toes had originated from a single, separate accessory bud from the fourth metatarsal, and the main fourth metatarsal had given rise to the normal fourth toe. The lateral sixth toe was excised, and a periosteal sleeve of the excised extra toe was used for reconstruction of the lateral collateral ligament. We propose that this heretofore unmentioned presentation of postaxial polydactyly be added to the existing systems of classification of pedal polydactyly. A review of the published data pertaining to pedal polydactyly has also been presented.

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Foot polydactyly is one of the most commonly encountered birth malformations worldwide (1–3). It has been defined as a congenital anomaly characterized by the presence of extra toes, including phalanges, with or without metatarsals (4). Several classification systems for polydactyly have been described in published studies (Fig. 1) (2,3,5–7). It can be categorized into preaxial, central, and postaxial forms. Foot postaxial polydactyly, or the presence of an extra digit adjacent to little (fifth) toe, has been the most common form of pedal polydactyly, accounting for 77% to 85% of reported cases (1,7–9). Duplication of the proximal phalanx with an associated wide metatarsal head has been the most frequent anatomic variant (1,8). Polydactyly can occur as an isolated condition or in association with a particular genetic syndrome (5). The clinical presentation will vary and can include pain, difficulty fitting shoes, and cosmetic considerations (4). Surgical excision of the extra digit with reconstruction has been the mainstay of management, with good to excellent results reported in published studies (1,8,10,11). In the present report, we have described the case of an otherwise healthy 2-year-old female,

who presented with isolated left foot postaxial polydactyly and atypical radiographic findings that we do not believe have been previously reported. A review of the published data related to pedal polydactyly has also been presented.

### Case Report

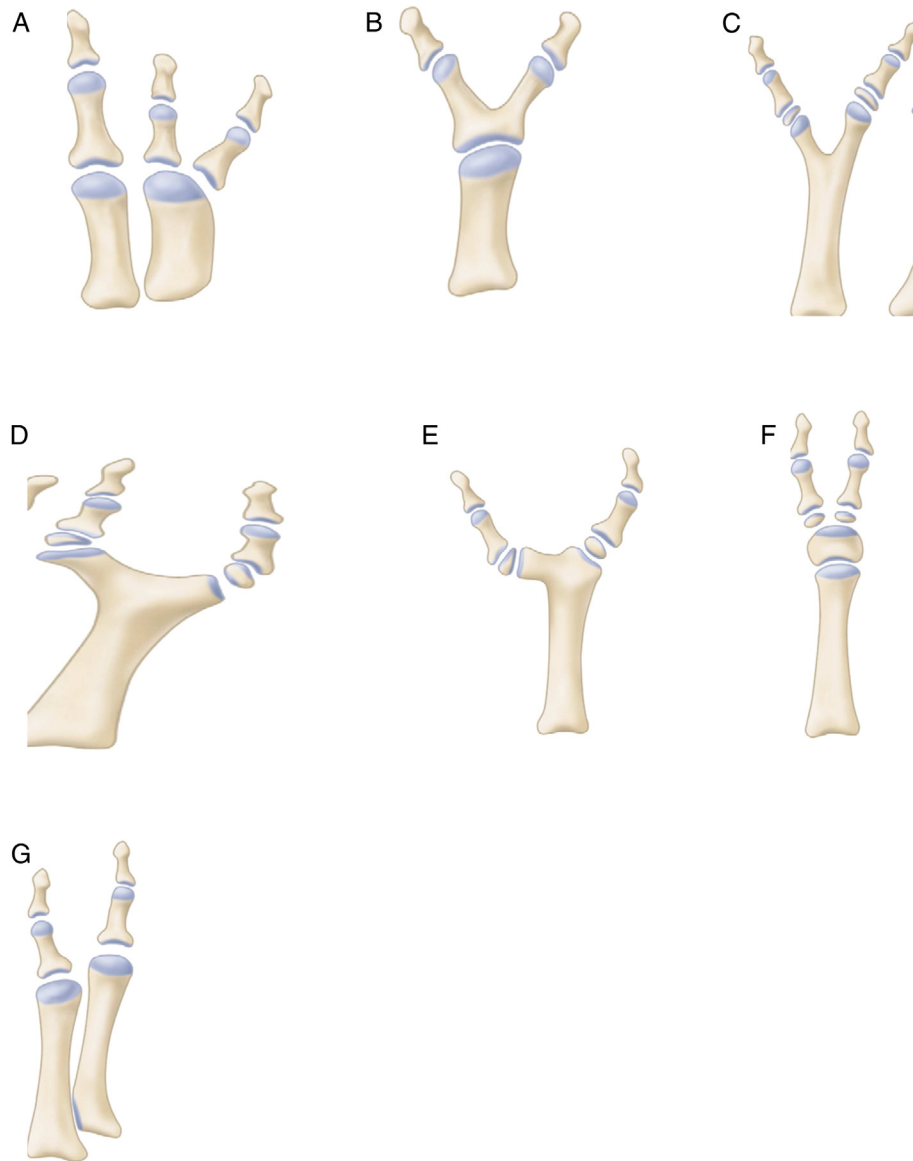
A 2-year-old female presented, with her parents, to our clinic with a parental concern of an isolated extra left little toe with no other medical illness and no other congenital deformity (Fig. 2). The supernumerary fifth toe made it difficult for the child to wear shoes without cutaneous irritation, and the parents were also concerned about the appearance of the extra toe. We obtained radiographs of the child's left foot and noted the usual 5 metatarsals. However, the distal aspect of the fifth metatarsal was blocked, with elongation of the medial condyle of the head, and the fifth metatarsal did not appear to articulate with a toe. Instead, the fifth and supernumerary sixth toes articulated with a separate osseous bud that had originated and extended laterally from the fourth metatarsal, and the distal, medial portion of the primary fourth metatarsal articulated with the fourth toe (Figs. 3 and 4). After discussions with the parents and preparation of the patient, we took the child to the operating room and, under general anesthesia with laryngeal mask, we applied the tourniquet at the thigh area and inflated it after we prepped and draped the patient

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**Fig. 1.** Venn-Watson classification. (A) Preaxial polydactyly of the big toe (short block first metatarsal), (B) preaxial polydactyly of the big toe (wide metatarsal head), (C) postaxial polydactyly of the little toe (Y-metatarsal), (D) postaxial polydactyly of the little toe (Y-metatarsal), (E) postaxial polydactyly of the little toe (T-metatarsal), (F) postaxial polydactyly of the little toe (wide metatarsal head), and (G) postaxial polydactyly of the little toe (complete duplication).

(100 mm Hg more than the systolic pressure of the patient). We reconstructed the lateral collateral ligament of the metatarsophalangeal joint of the left little toe using an elliptical incision. We reconstructed the lateral collateral ligament of the metatarsophalangeal joint of the left little toe using polypropylene sutures, and the residual periosteal sleeve of the excised supernumerary digit. The superficial fascia and skin layers were then closed using absorbable sutures. She was initially bandaged lightly with cotton roll, and we applied a complete plaster of Paris cast to reduce the mobility of the reconstructed lateral collateral ligament. We allowed weight on her foot, as tolerated, at 1 week. She proceeded to heal unremarkably, and at 4 months postoperatively, she displayed a well-healed postoperative scar and no evidence of any complications related to the surgery (Fig. 5).

## Discussion

Polydactyly is the most common birth deformity of the forefoot, with an overall incidence of approximately 2 cases per 1000 live

births (1–3). The frequency of pedal polydactyly differs significantly among populations and has been particularly high in African and Asian populations (12). Foot postaxial polydactyly has been the most predominant form in African populations, and foot preaxial polydactyly has been the most predominant form in Asian (ie, Hong-Kong, Philippine, and Malaysian) populations (12). Foot polydactyly is a congenital malformation characterized by the presence of 6 or more toes, with or without duplication of the corresponding metatarsals or phalanges (4). The supernumerary toe can be well developed and functional or rudimentary and nonfunctional. Bilateral involvement will be present in 50% of patients with foot polydactyly, and symmetry will be present in 62% of the bilateral cases (8). Hand polydactyly and syndactyly has been associated with 34% and 22% of patients with foot polydactyly, respectively (8).

A number of classification systems of foot polydactyly have been suggested in published studies (2,3,5–7). According to the anatomic location of the extra toe, Temtamy and McKusick (5) classified foot polydactyly into preaxial, central, and postaxial forms. Preaxial

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