POLYDACTYLY

Polydactyly is a common congenital abnormality characterized by the presence of greater than 5 digits on a hand or foot.

ETIOLOGY

- Polydactyly is associated with both defective apoptosis during limb development and genetic mutations
- Together these cause dysfunction in signalling pathways which are responsible for fetal limb growth
- Involvement of the hand is twice as common as the foot

CLASSIFICATION OF POLYDACTYLY

Preaxial Polydactyly

- Affecting the 1st digit of the hand or foot
- Foot involved → Tibial polydactyly
- Hand involved → Radial polydactyly
- Radial polydactyly is the most common polydactyly of the hand

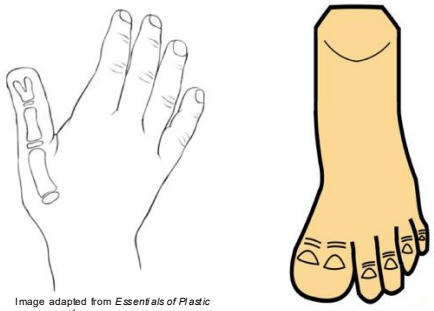

Image adapted from *Essentials of Plastic Surgery* (2nd Edition). By Jeffrey E. Janis

Postaxial Polydactyly

- Affecting the 5th digit of the hand or foot
- Foot involved → Fibular polydactyly
- Hand involved → Ulnar polydactyly
- Ulnar polydactyly categorized as Type A or B which impacts management

Type A

- Well developed
- 29% syndromic association

Type B

- Rudimentary and pedunculated

Images adapted from *A review of polydactyly and its inheritance: Connecting the dots*. (Medicine 2022). Bubshait DK.

Central Polydactyly

- Affecting the 2nd, 3rd, or 4th digits of the hand or foot
- Often associated with syndactyly (fused or webbed fingers)
- Overall, central polydactyly is less common than preaxial and postaxial anomalies

EVALUATION

- **Antenatal**: Starting at 9 weeks gestational age, finger buds of the developing fetus are visible with ultrasound
- **Postnatal:** History and physical exam looking for signs of associated syndromes, family history of hand abnormalities
- 3-view radiographic assessment is required in Preaxial polydactyly to help classify the extent of bony involvement

COMMONLY ASSOCIATED SYNDROMES/CONDITIONS

- Trisomy 21 (specifically Preaxial polydactyly), Trisomy 13, Meckel-Gruber syndrome, VACTERL association, Bardet-Beidl syndrome, Fanconi anemia, Ellis-van Creveld syndrome, Chondroectodermal dysplasia

MANAGEMENT

- Consultation of a pediatric Plastic surgeon → General principle is to remove the least functional digit
  - The complexity of the procedure depends on the classification of the polydactyly
- Delay intervention until **6-18 months of age** to assess the **child's functional status**
  - Except for Postaxial Type B cases, where excision can be done in the office setting under local anesthetic
- If associated syndrome is suspected, consultation of Pediatrician/Genetics is recommended for further assessment

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