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

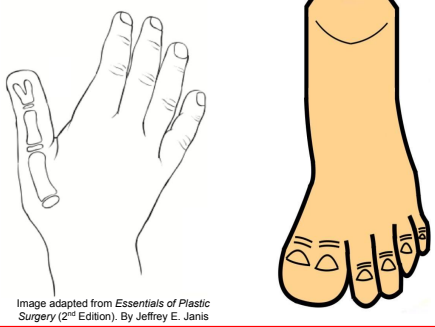

Image adapted from *Essentials of Plastic Surgery* (2nd Edition). By Jeffrey E. Janis

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	Type B
Well developed 29% syndromic association	Rudimentary and pedunculated

Images adapted from *A review of polydactyly and its inheritance: Connecting the dots.* (Medicine 2022). Bubshiat 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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Nolan Broeke (Medical Student, University of Alberta), Dr. Curtis Budden (Assistant Professor, University of Alberta) for www.pedscases.com