Classification of Congenital Hand Anomalies

Introduction
In 2014, the IFSSH recommended the adopting the OMT (Oberg-Manske-Tonkin, after the authors) classification to replace the Swanson classification.

Problems with the Swanson classification

1. **Inconsistent categorization.** Group I and II classified based on causation while III to VI based on appearance.
2. **Difficulty classifying some conditions.** This led to modifications, for example the JSSH adding two groups; “Abnormal induction of rays” and “Unclassifiable cases.” The category of “Abnormal induction of rays” includes syndactyly, the central polydactyly- clet hand-osseous syndactyly complex, and triphalangeal thumb. This concept was based on recent embryologic studies supporting a common etiology for central poly- actyly, syndactyly, and typical clet hand

OMT System
A comprehensive upper limb congenital anomaly classification system that uses dysmorphological terminology.

Main Groups

- Malformation - into UE vs hand plate, then according to axes; but also unspecified axis -- syndactyly, brachydactyly
- Deformation
- Dysplasias
- Syndromes
- Others

Pros of the OMT

- updated to align with better understanding of embryology process
- easier to classify some

Cons of OMT

- Multiple anomalies - difficult classify
- Still some ambiguity and overlap
  - -- e.g. syndromes - may have multiple, but sometimes major --> e.g. RLD and VACTERL,
  - -- split into upper limb and hand plate is artificial e.g. brachydactyly
  - -- separate classification of multiple anomalies - when is separate - e.g. hypoplastic duplicate thumbs, Syndactyly/poly/reverse skiier
  - -- arthrogryposis in syndrome
  - -- unclear symbrachydactyly develops --> transverse arrest or PD problem
- Non-intuitive - thumb hypoplasia and duplication in the same major axis group, but thumb hypoplasia in different group from RLD -- for which there is evidence that they are related

In Q&A format

**Congenital Hand Classification**

**History**

**OMT**

**What?**

An upper limb congenital anomaly classification system - comprehensive
uses dysmorphological terminology terms compared to Swanson

**Pros**

- updated to align with better understanding of embryology process
- easier to classify some
Cons
- Others "not otherwise specified" - many unknown
- Multiple anomalies - difficult classify
- Still some ambiguity and overlap
  -- e.g. syndromes - may have multiple, but sometimes major --> e.g. RLD and VACTERL,
  -- split into upper limb and hand plate is artificial e.g. brachydactyly
  -- separate classification of multiple anomalies - when is separate - e.g. hypoplastic duplicate thumbs, Syndactyly/poly/reverse skier
  -- arthrogryposis in syndrome
  -- unclear symbrachydactyly develops --> transverse arrest or PD problem
- non-intuitive - thumb hypoplasia and duplication in the same major axis group, but thumb hypoplasia in different group from RLD -- for which there is evidence that they are related
- does not guide treatment

Why?
Swanson - based on mix of cause (I and II) and appearance (III and VI)
difficult to classify some --> modification e.g. - modified by JSSH adding two groups: "Abnormal induction of rays" and "Unclassifiable cases." The category of "Abnormal induction of rays" includes syndactyly, the central polydactyly- clef hand-osseous syndactyly complex, and triphalangeal thumb.
This concept was based on recent embryologic studies supporting a common etiology for central polyactyly, syndactyly, and typical clef hand
  - debate - Tonkin (see Moon SC) - "abnormal formation" & "abnormal induction"? semantics

How?
Malformation - into UE vs hand plate, then according to axes; but also unspecified axis -- syndactyly, brachydactyly
Deformation
Dysplasias
Syndrome
Others

When?
Proposed some years ago, but recommended for use by IFSSH in 2014

Who?
Oberg-Manske-Tonkin