OMT CLASSIFICATION OF CONGENITAL HAND AND UPPER LIMB ANOMALIES

Updated 28th January, 2015

I. MALFORMATIONS

A. Abnormal axis formation/differentiation—entire upper limb

1. Proximal-distal axis

i. Brachymelia with brachydactyly
ii. Symbrachydactyly
  a) Poland syndrome
  b) Whole limb excluding Poland syndrome
iii. Transverse deficiency
  a) Amelia
  b) Clavicular/scapular
  c) Humeral (above elbow)
  d) Forearm (below elbow)
  e) Wrist (carpals absent/at level of proximal carpals/at level of distal carpals) (with forearm/arm involvement)
  f) Metacarpal (with forearm/arm involvement)
  g) Phalangeal (proximal/middle/distal) (with forearm/arm involvement)
iv. Intersegmental deficiency
  a) Proximal (humeral – rhizomelic)
  b) Distal (forearm – mesomelic)
  c) Total (Phocomelia)
v. Whole limb duplication/triplication

2. Radial-ulnar (anterior-posterior) axis

i. Radial longitudinal deficiency - Thumb hypoplasia (with proximal limb involvement)
ii. Ulnar longitudinal deficiency
iii. Ulnar dimelia
iv. Radioulnar synostosis
v. Congenital dislocation of the radial head
vi. Humeroradial synostosis - Elbow ankyloses
vii. Madelung deformity

3. Dorsal-ventral axis

i. Ventral dimelia
  a) Furhmann/Al-Awadi/Raas-Rothschild syndromes
  b) Nail Patella syndrome
ii. Absent/hypoplastic extensor/flexor muscles

4. Unspecified axis

i. Shoulder
  a) Undescended (Sprengel)
  b) Abnormal shoulder muscles
  c) Not otherwise specified
ii. Arthrogryposis

B. Abnormal axis formation/differentiation— hand plate

1. Proximal-distal axis

i. Brachydactyly (no forearm/arm involvement)
ii. Symbrachydactyly (no forearm/arm involvement)
iii. Transverse deficiency (no forearm/arm involvement)
  a) Wrist (carpals absent/at level of proximal carpals/at level of distal carpals)
  b) Metacarpal
  c) Phalangeal (proximal/middle/distal)

2. Radial-ulnar (anterior-posterior) axis

i. Radial deficiency (thumb - no forearm/arm involvement)
ii. Ulnar deficiency (no forearm/arm involvement)
iii. Radial polydactyly
iv. Triphalangeal thumb
v. Ulnar dimelia (mirror hand – no forearm/arm involvement)
vi. Ulnar polydactyly

3. Dorsal-ventral axis

i. Dorsal dimelia (palmar nail)
ii. Ventral (palmar) dimelia (including hypoplastic/aplastic nail)

4. Unspecified axis

i. Soft tissue
  a) Syndactyly
  b) Camptodactyly
  c) Thumb in palm deformity
  d) Distal arthrogryposis
ii. Skeletal deficiency
  a) Clinodactyly
  b) Kirner's deformity
  c) Synostosis/symphalangism (carpal/metacarpal/phalangeal)
iii. Complex
  a) Complex syndactyly
  b) Synpolydactyly— central
  c) Cleft hand
  d) Apert hand
  e) Not otherwise specified

II. DEFORMATIONS

A. Constriction ring sequence
B. Trigger digits
C. Not otherwise specified

III. DYSPLASIAS

A. Hypertrophy

1. Whole limb

i. Hemihypertrophy
ii. Aberrant flexor/extensor/intrinsic muscle

2. Partial limb

i. Macrodactyly
ii. Aberrant intrinsic muscles of hand

B. Tumorous conditions

1. Vascular
- i. Hemangioma
- ii. Malformation
- iii. Others

2. Neurological
- i. Neurofibromatosis
- ii. Others

3. Connective tissue
- i. Juvenile aponeurotic fibroma
- ii. Infantile digital fibroma
- iii. Others

4. Skeletal
- i. Osteochondromatosis
- ii. Enchondromatosis
- iii. Fibrous dysplasia
- iv. Epiphyseal abnormalities
- v. Others

IV. SYNDROMES*

A. Specified

1. **Acrofacial Dysostosis 1 (Nager type)**
2. **Apert**
3. **Al-Awadi/Raas-Rothschild/Schinzel phocomelia**
4. **Baller-Gerold**
5. **Bardet-Biedl Carpenter**
6. **Beales**
7. **Catel-Manzke**
8. **Constriction band (Amniotic Band Sequence)**
9. **Cornelia de Lange (types 1-5)**
10. **Crouzon**
11. **Down**
12. **Ectrodactyly-Ectodermal Dysplasia-Clefting**
13. **Fanconi Pancytopenia**
14. **Fuhrmann**
15. **Goltz**
16. **Gorlin**
17. **Greig Cephalopolysyndactyly**
18. **Hajdu-Cheney**
19. **Hemifacial Microsomia (Goldenhar syndrome)**
20. **Holt-Oram**
21. **Lacrimoauriculodentodigital (Levy-Hollister)**
22. **Larsen**
23. **Leri-Weill Dyschondrosteosis**
24. **Moebius sequence**
25. **Multiple Synostoses**
26. **Nail-Patella**
27. **Noonan**
28. **Oculodentodigital dysplasia**
29. **Orofacialdigital**
30. **Otopalataldigital**
31. **Pallister-Hall**
32. **Pfeiffer**
33. **Pierre Robin**
34. **Poland**
35. **Proteus**
36. **Roberts-SC Phocomelia**
37. **Rothmund-Thomson**
38. **Rubinstein-Taybi**
39. **Saethre-Chotzen**
40. **Thrombocytopenia Absent Radius**
41. **Townes-Brock**
42. **Trichorhinophalangeal (types 1-3)**
43. **Ulnar-Mammary**
44. **VACTERLS association**

B. Others

*The specified syndromes are those considered most relevant; however, many other syndromes have a limb component categorized under “B. Others”.