Congenital Hand Differences in the Media

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https://www.youtube.com/watch?v=CM2QJO2IDFo
Reactions to the videos
Microsoft’s two-minute slot tells the stories of a number of young gamers with disabilities and how the Adaptive Controller levels the playing field in Xbox games. It’s part of

Kyle Griffin
@kylegriffin1

Best #SuperBowl ad of the night goes to Microsoft. Inclusive, heartwarming. A true celebration of and respect for those with physical disabilities.

"When everybody plays, we all win." [link](https://pic.twitter.com/tRKplHdKix)

7,501 7:50 PM - Feb 3, 2019

1,799 people are talking about this
born just right
Hand

ASSH

Hand

ASSH

Hand

Trapezoid
Trapezium
Scaphotrapeziotrapezoidal (STT) joint
Scaphoid
Radiocarpal Joint
Distal Radioulnar Joint (DRUJ)
Radius
Ulna

Capitate
Hamate
Triquetrum
Pisiform
Lunate
Ulnocarpal Joint
Arm Anatomy

Humerus

Ulna

Radius

Sternoclavicular joint

Acromioclavicular joint

Clavicle

Coracoid process

Acromion

Glenohumeral joint

Glenoid cavity

Scapula

Humerus
Embryology

- Limb buds: mesoderm covered in ectoderm
  - **Mesoderm**: “Means to get around” aka skeletal, cardiovascular
  - **Ectoderm**: “Attractoderm” aka skin, hair, nails, brain
  - **Endoderm**: “Endernal-organs” NOT INCLUDED HERE

- Upper limb bud: WEEK 6
- Hand plate: WEEK 8

- Limb axis formation: Proximodistal axis, dorsoventral axis, anteroposterior axis
Are congenital hand differences common?

1982 study Lamb et al.:
- 11/10,000 births
- Most common: syndactyly, polydactyly, camptodactyly
## Classification of Congenital Hand Differences

<table>
<thead>
<tr>
<th>I.</th>
<th>Failure of formation</th>
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<tbody>
<tr>
<td>II.</td>
<td>Failure of differentiation</td>
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<tr>
<td>III.</td>
<td>Duplication</td>
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<td>IV.</td>
<td>Overgrowth</td>
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<tr>
<td>V.</td>
<td>Undergrowth</td>
</tr>
<tr>
<td>VI.</td>
<td>Congenital constriction band syndrome</td>
</tr>
<tr>
<td>VII.</td>
<td>Generalized skeletal abnormalities</td>
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</tbody>
</table>
Amelia: congenital amputation of upper extremity

Fig. 12.2 Amelia, arm level or congenital transverse absence at the humeral level is very unusual and not necessarily indicative of any syndrome
Hemimelia: absence of part of limb, eg forearm
https://www.youtube.com/watch?v=kbHXIN6EzWo
Achiria: absent wrist

Peromelia: absent hand
Ametacarapia: absent metacarpals

Aphalangia: absent finger
Phocomelia: segmental failure of limb growth

- Greek for “seal limb”
- Thalidomide:
  - Drug used for morning sickness in pregnant women 1960s
- 3 types
  - I: Hand attached to scapula
  - II: Forearm attached to scapula
  - III: Absent forearm with hand attached to humerus
**Syndactyly:** fusion of adjacent fingers

- Partial v Complete
- Simple v Complex v “Complicated”
Brachy: short, eg brachymetacarpia, brachydactyly
http://www.cc.com/video-clips/7ynwra/tosh-0-megan-fox-s-toe-thumbs
• **Symbrachydactyly:**
  Nubbins
  Puckered skin
  4 types

**they have fingernails**
Amniotic Constriction Band: loss of digits/limbs in multiple areas due to in utero tight bands
https://www.youtube.com/watch?v=cWpqyT4Qib4
Polydactyly: multiple digits
3 Types of Polydactyly

Radial  Central  Ulnar
Pre-axial or Radial Polydactyly: thumb polydactyly
Post axial or Ulnar Polydactyly: small finger duplication
Type IV: completely formed 6\textsuperscript{th} digit
Macroductyly: overgrowth
Arthrogryposis: multiple joint contractures
Radial longitudinal deficiency: short or absent radius and radial structures
Pollicization: turning a finger into a thumb
Ulnar longitudinal deficiency: ulna shortening/absence, synostosis, digit loss/anomalies
Time for a quiz!
Grover:

https://youtu.be/_YISTzpLXCY
Grover: symbracydactyly

- Nubbins
- Puckered skin
- Foreshortened fingers OR APLASIA
Jordan and Sean
Amelia and Hemimelia
Ulnar Longitudinal Deficiency

- Loss of digits
- Synostosis of digits
- Likely fusion of ulna to humerus at elbow
Shaquem
Per reports he had amniotic band syndrome resulting in amputation of the hand at 4yo
Escobar Syndrome

- Form of arthrogryposis
- Multiple pterygium
References

- http://www.assh.org/handcare/Anatomy/Bones
- https://www.bornjustright.org/
- http://congenitalhand.wustl.edu/search/label/Symbrachydactyly
- Microsoft: When everybody plays we all win
- Gillette & NFL: Your best never comes easy
- The Princess Bride