



Congenital Hand Differences in the Media

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▶ Microsoft ad: <https://www.youtube.com/watch?v=vQYzsiVscNg>

Reactions to the videos

No No's

THE VERGE

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." pic.twitter.com/tRKplHdKix

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



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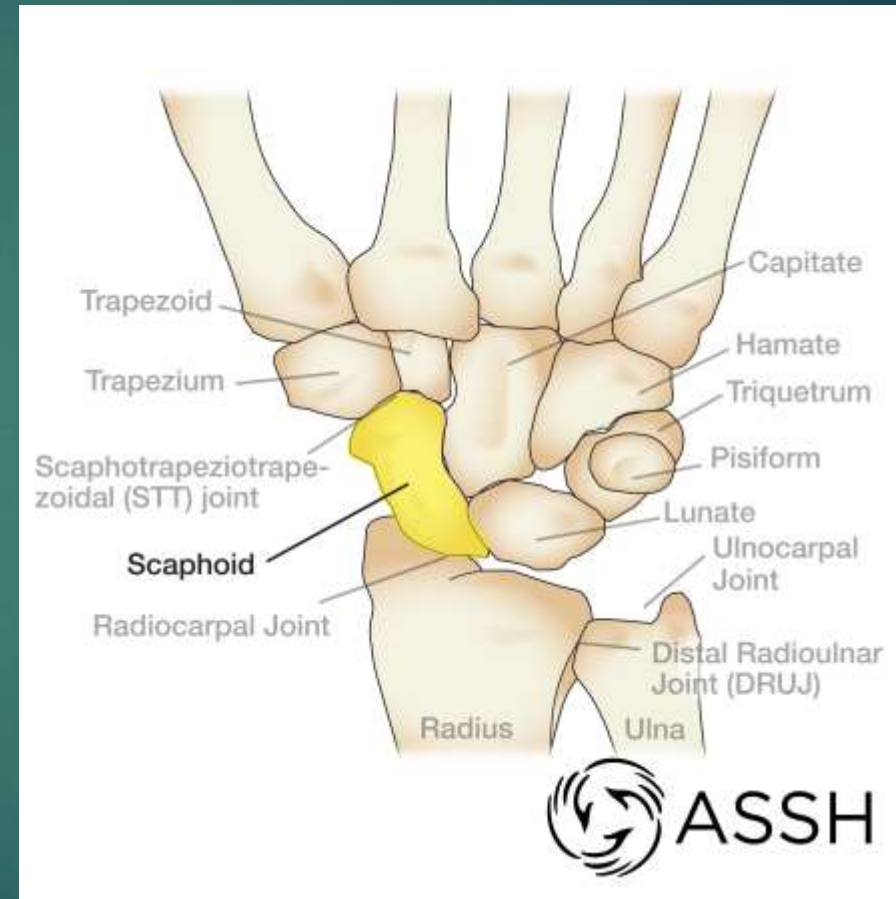
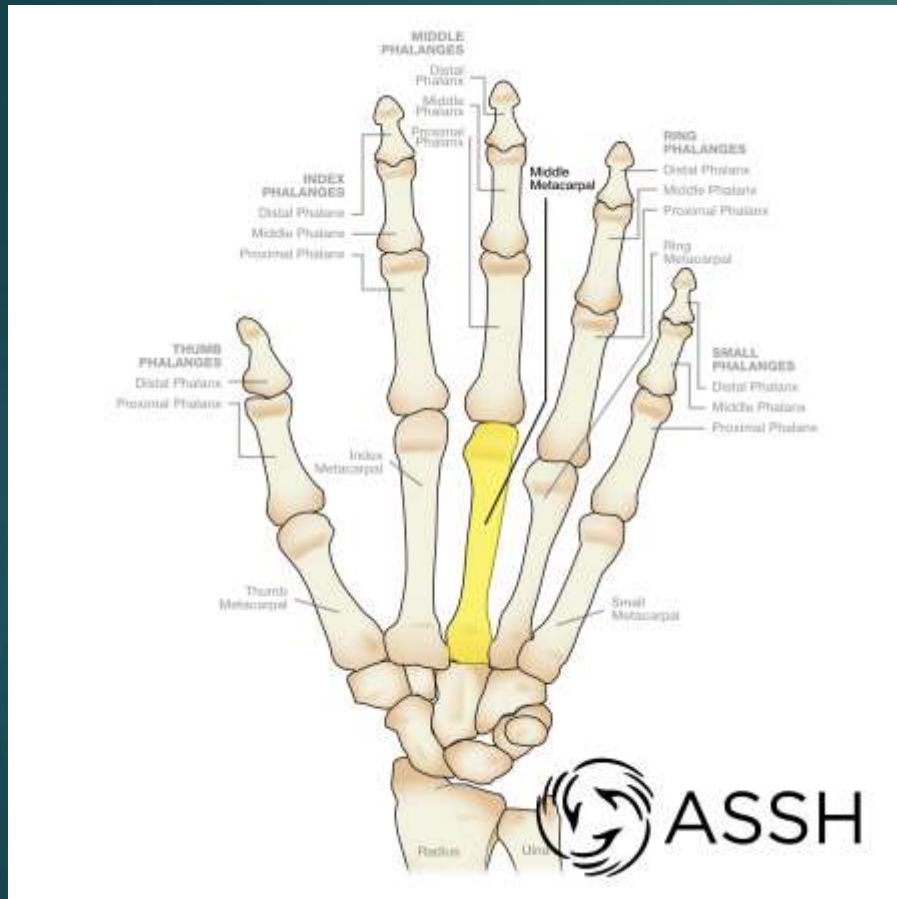
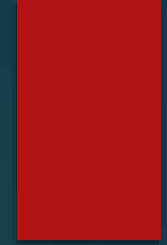
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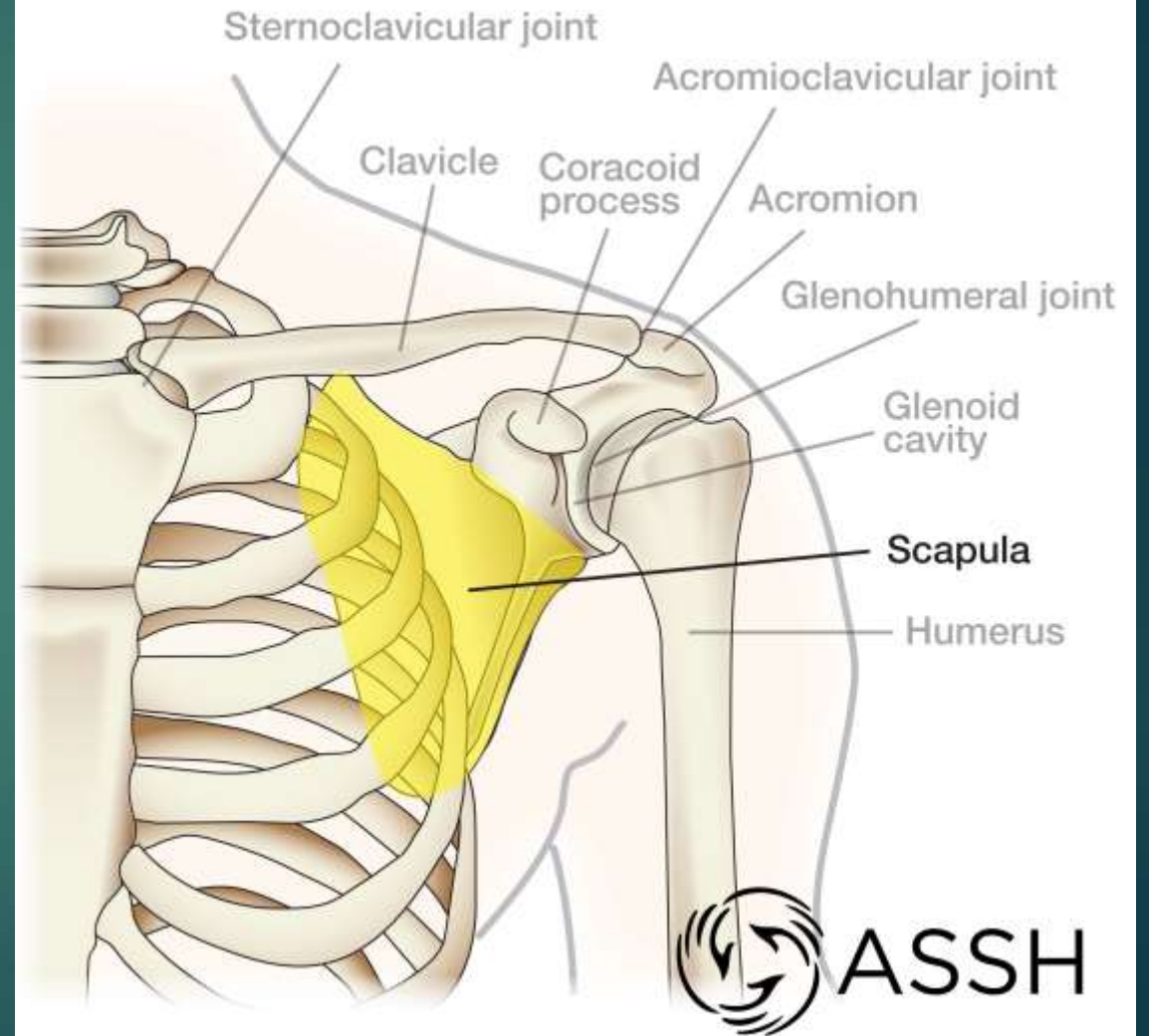
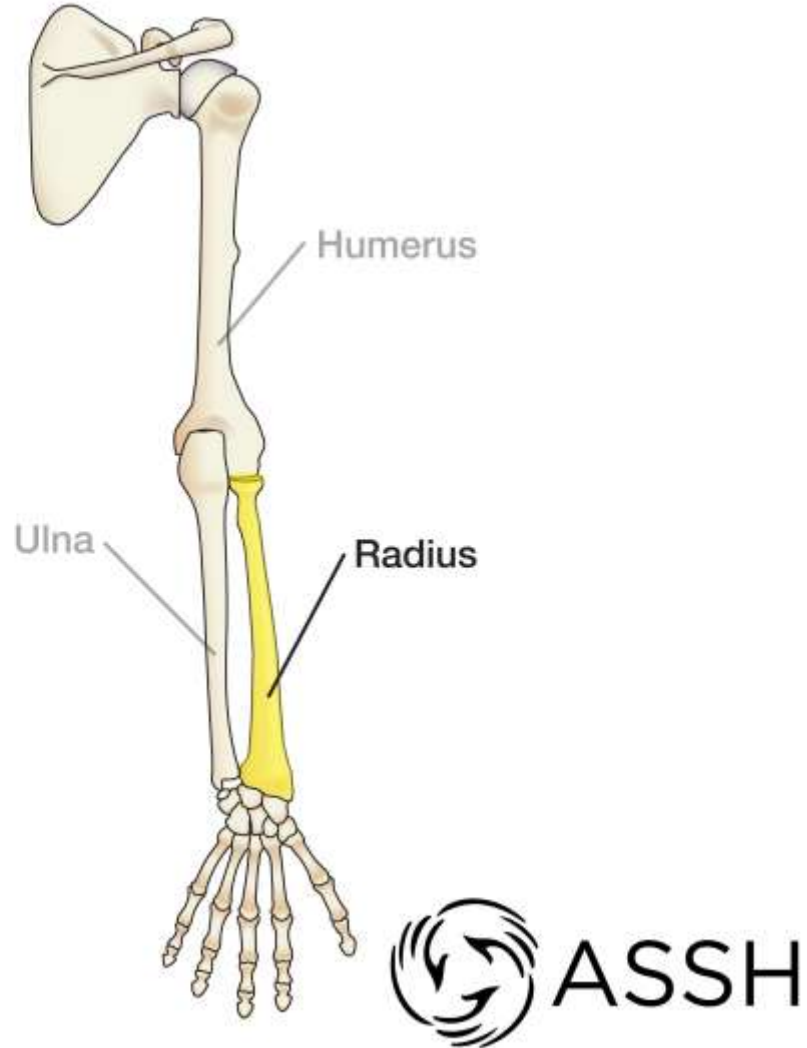


born just right

Hand



Arm Anatomy

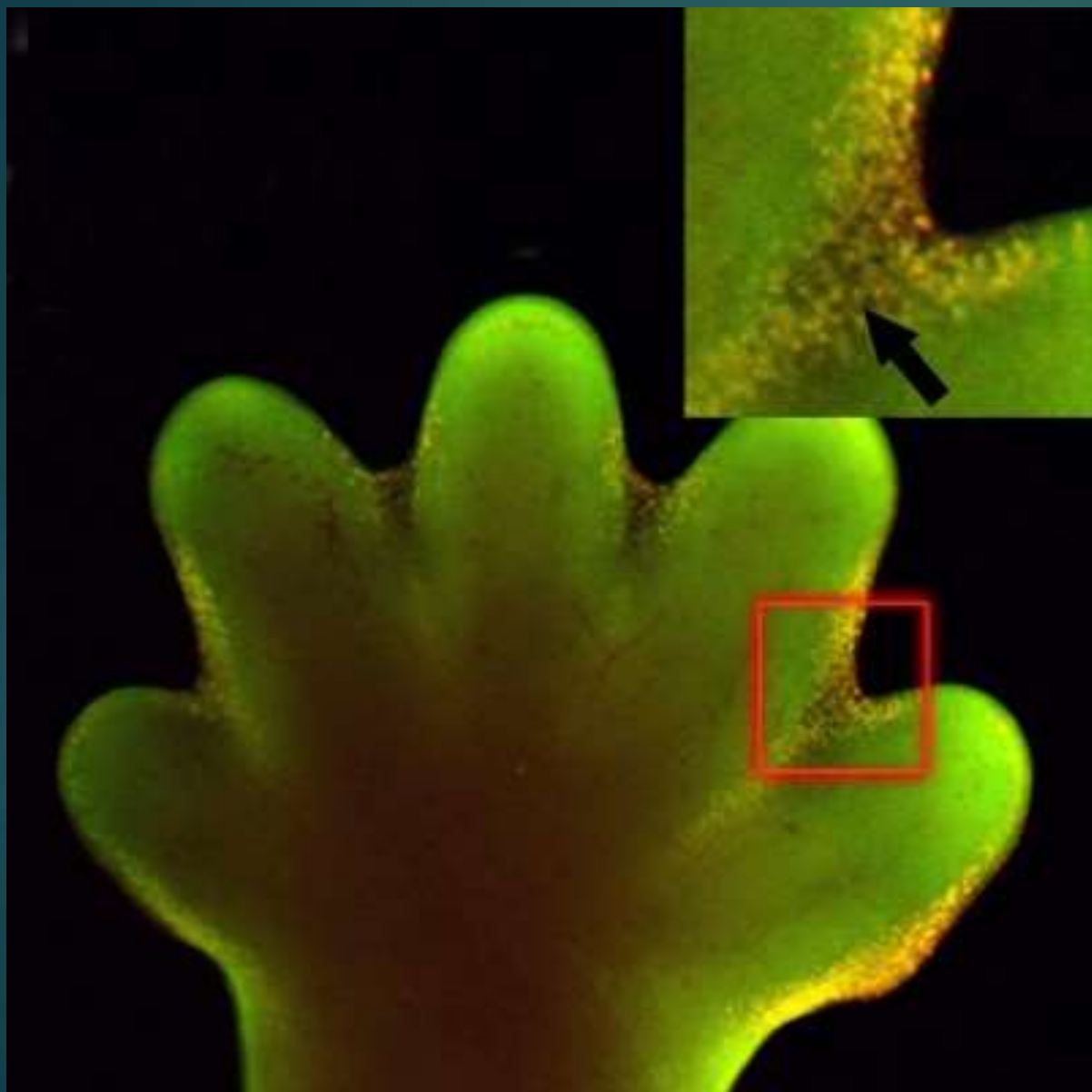


Embryology

- ▶ 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

I. Failure of formation

II. Failure of differentiation

III. Duplication

IV. Overgrowth

V. Undergrowth

VI. Congenital constriction band syndrome

VII. Generalized skeletal abnormalities

Amelia: congenital amputation of upper extremity

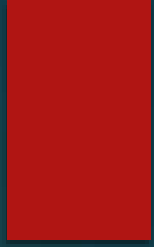


Fig. 12.2 Amelia, arm level or congenital transverse absence at the humeral level is very unusual and not necessarily indicative of any syndrome



Hemimelia: absence of part of limb, eg forearm







▶ Gillette ad: <https://www.youtube.com/watch?v=vQYzsiVscNg>



Achiria: absent wrist

Peromelia: absent hand



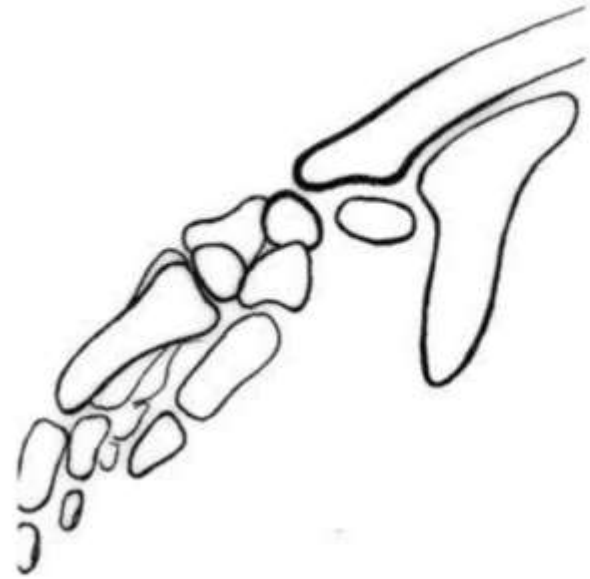
Ametacarapia:
absent
metacarpals



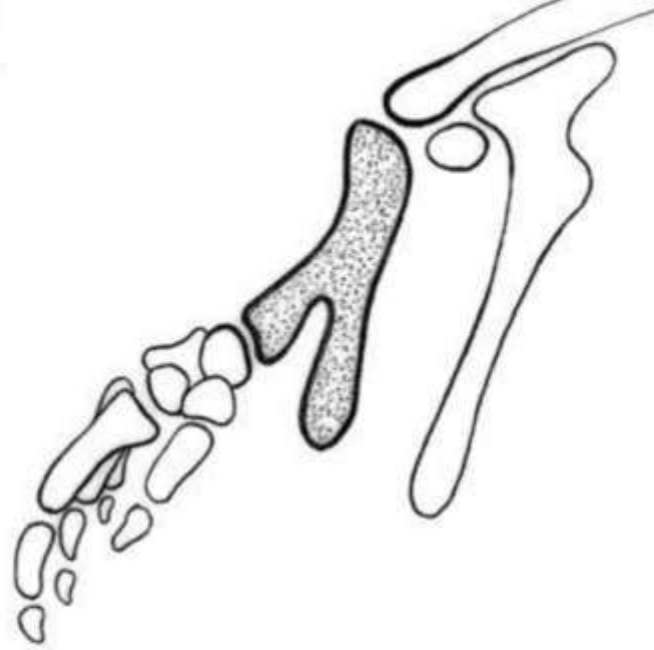
Aphalangia:
absent finger

Phocomelia: segmental failure of limb growth

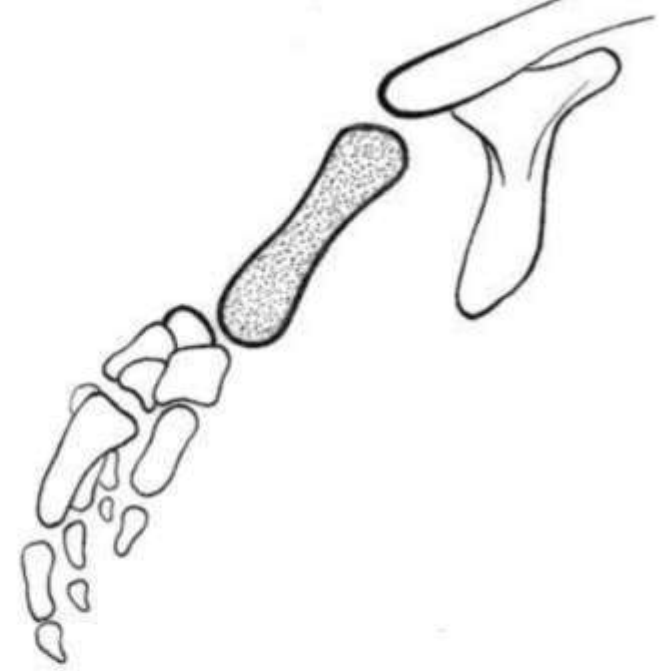
- ▶ Greek for “seal limb”
- ▶ Thalidomide:
 - ▶ Drug used for morning sickness in pregnant women 1960s
- ▶ 3 types
 - ▶ I: Hand attached to scapula
 - ▶ II: Forearm attached to scapula
 - ▶ III: Absent forearm with hand attached to humerus



a



b

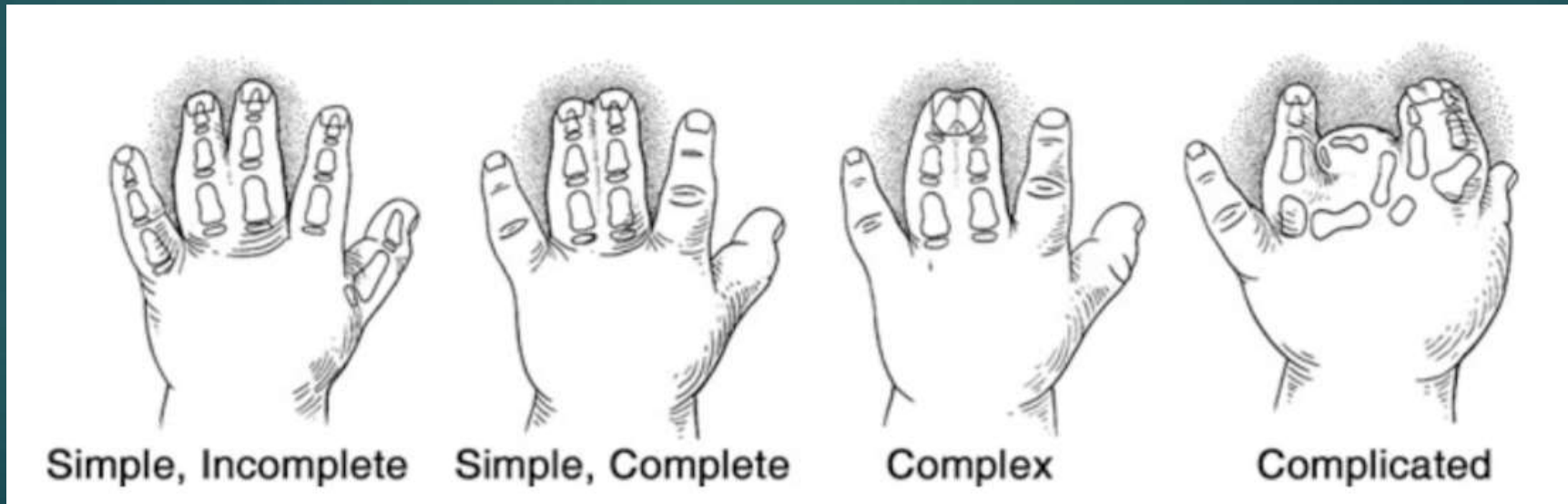


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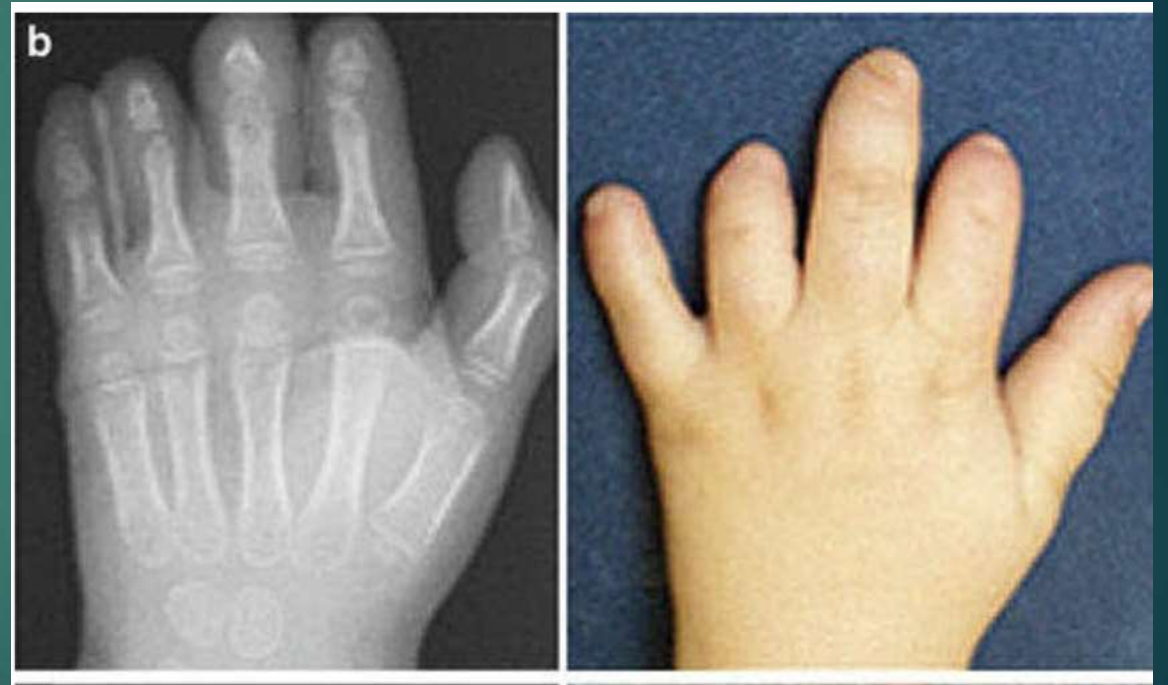


Syndactyly: fusion of adjacent fingers

- ▶ Partial v Complete
- ▶ Simple v Complex v “Complicated”



Brachy: short, eg
brachymetacarpia, brachydactyly



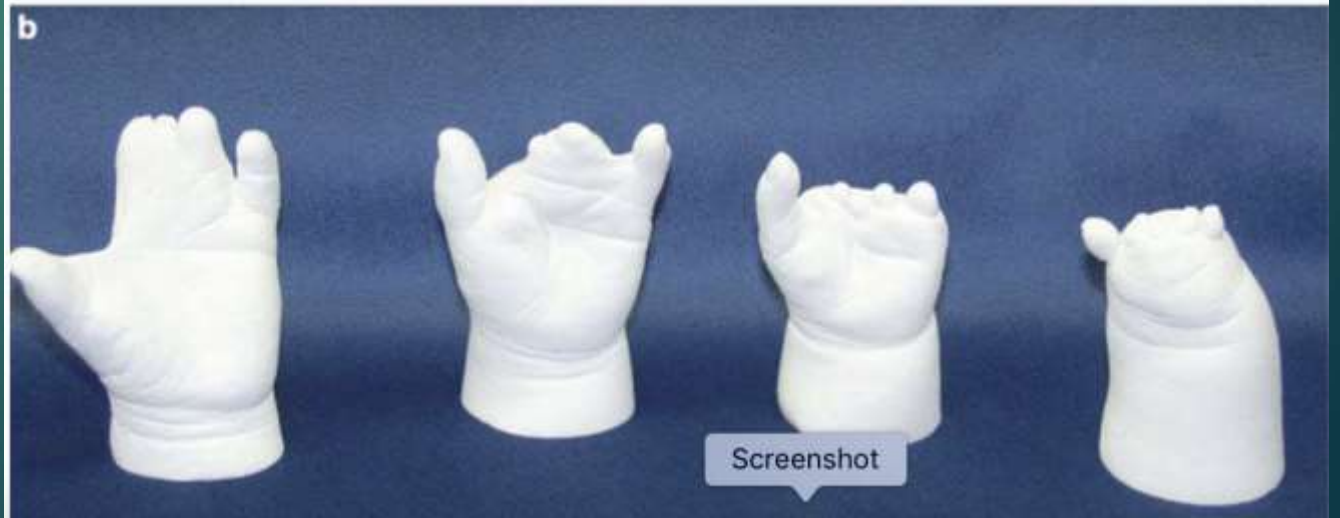
Tosh.O <http://www.cc.com/video-clips/7ynwra/tosh-0-megan-fox-s-toe-thumbs>



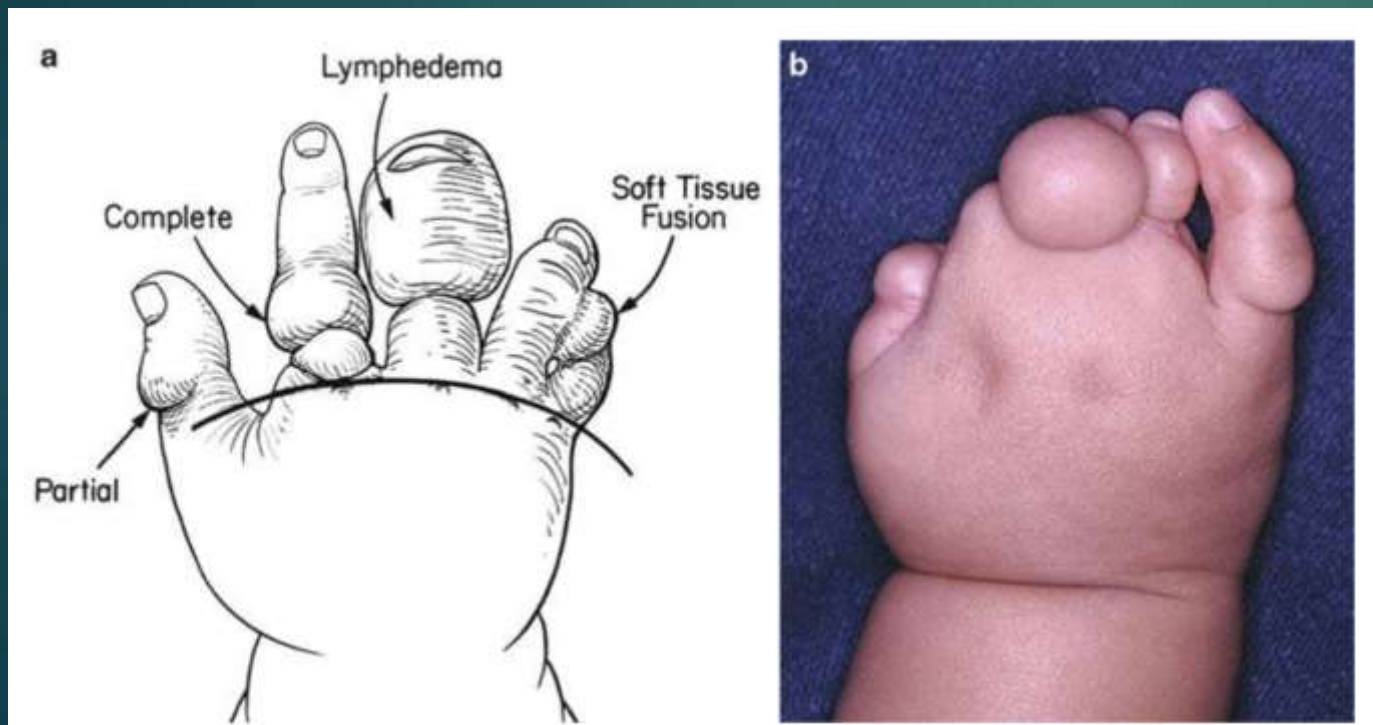
- Symbrachydactyly:

Nubbins
Puckered skin
4 types

**they have fingernails



Amniotic Constriction Band: loss of digits/limbs in multiple areas due to in utero tight bands



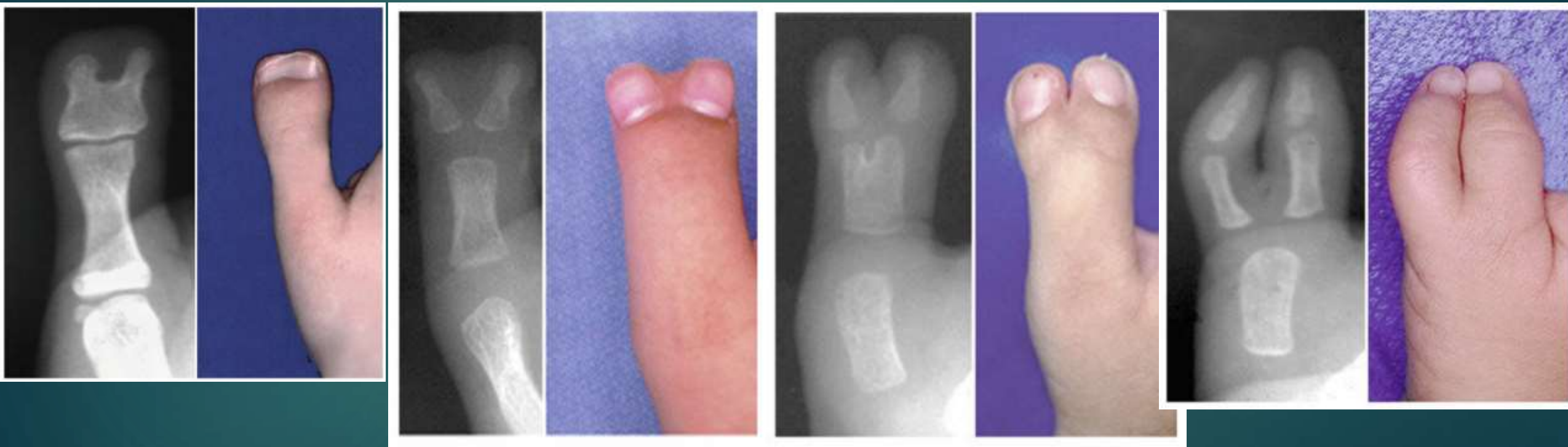
Polydactyly: multiple digits



3 Types of Polydactyly



Pre-axial or Radial Polydactyly: thumb polydactyly





Post axial or Ulnar Polydactyly: small finger duplication

Type I



Type II



Type III



Type IV: completely formed 6th digit



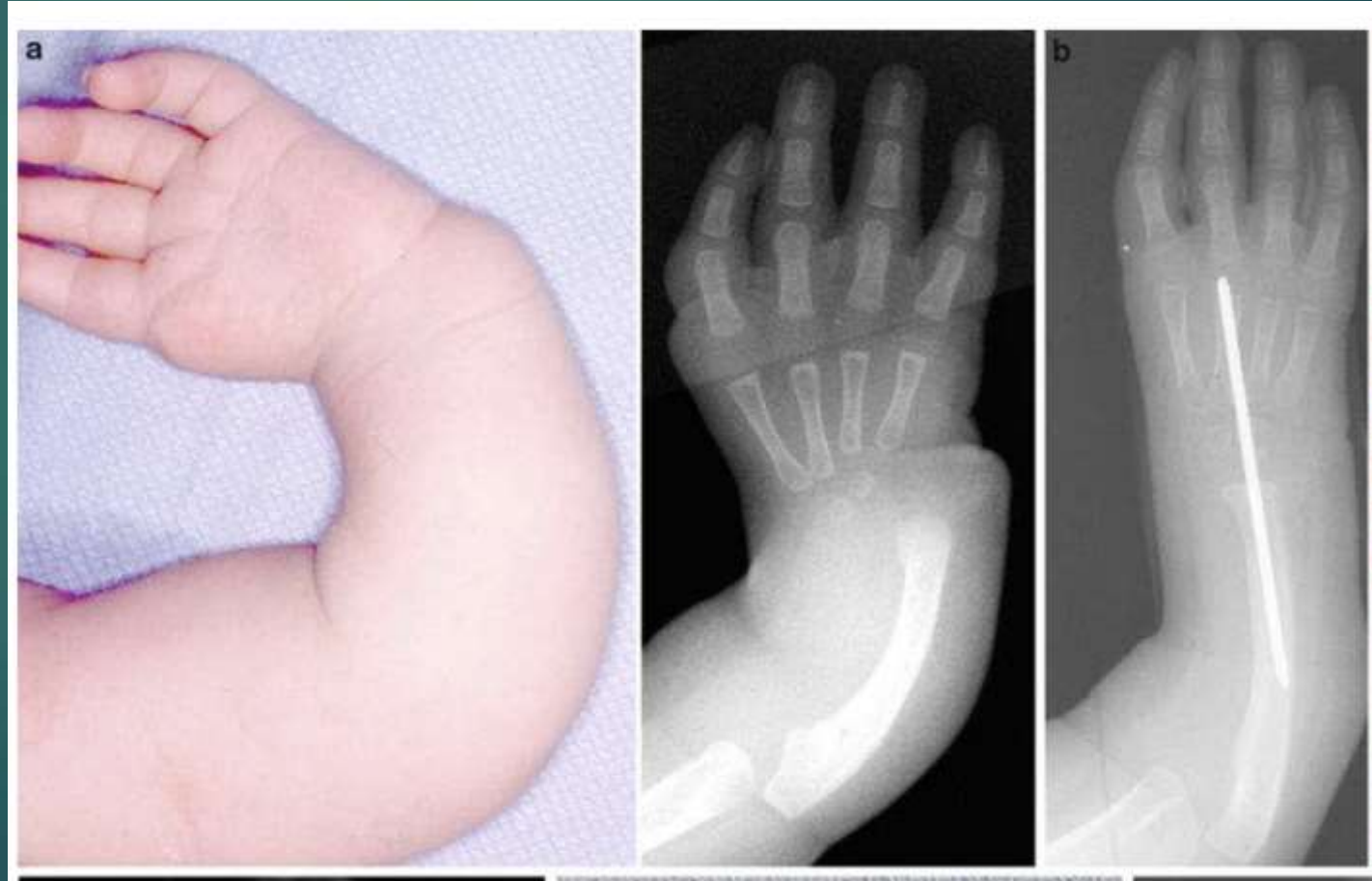
Macrodactyly: overgrowth



Arthrogryposis: multiple joint contractures, ptyergium = skin webbing



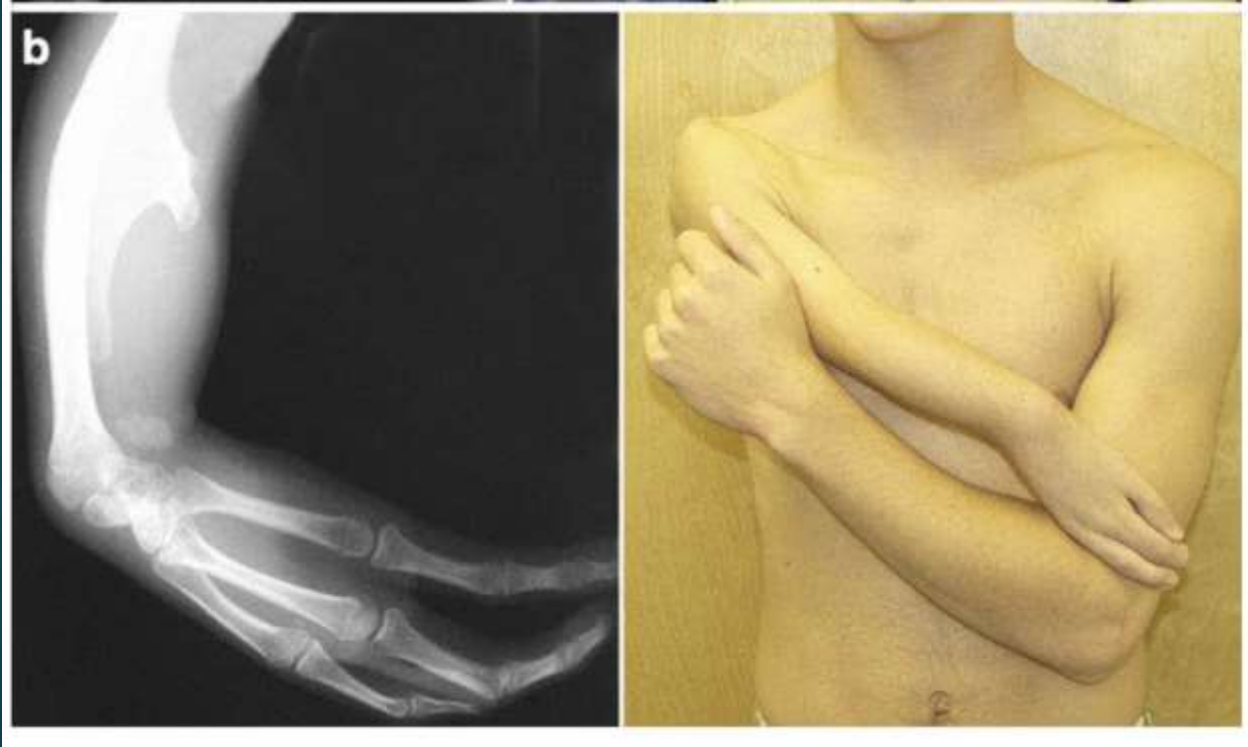
Radial longitudinal deficiency: short or absent radius and radial structures



Pollicization: turning a finger into a thumb



Ulnar longitudinal deficiency: ulna shortening/absence, synostosis at elbow, digit loss/anomolies



Time for a quiz!

Grover:



The image shows a YouTube video player interface. At the top left is the Microsoft logo. The video title is "Microsoft Super Bowl Commercial 2019: We AI...". To the right of the title are icons for "Watch later" and "Share". The video content shows a young boy with curly hair wearing a black baseball cap and a grey t-shirt, with his hands raised in a gesture. In the bottom left corner of the video frame, there is a "MORE VIDEOS" button. The bottom of the player features a progress bar, a play button, a volume icon, the time "0:09 / 1:56", a settings gear icon, the "YouTube" logo, and a full-screen icon. A small Microsoft logo is also visible in the bottom right corner of the video frame.

Microsoft Super Bowl Commercial 2019: We AI...

Watch later Share

MORE VIDEOS

0:09 / 1:56

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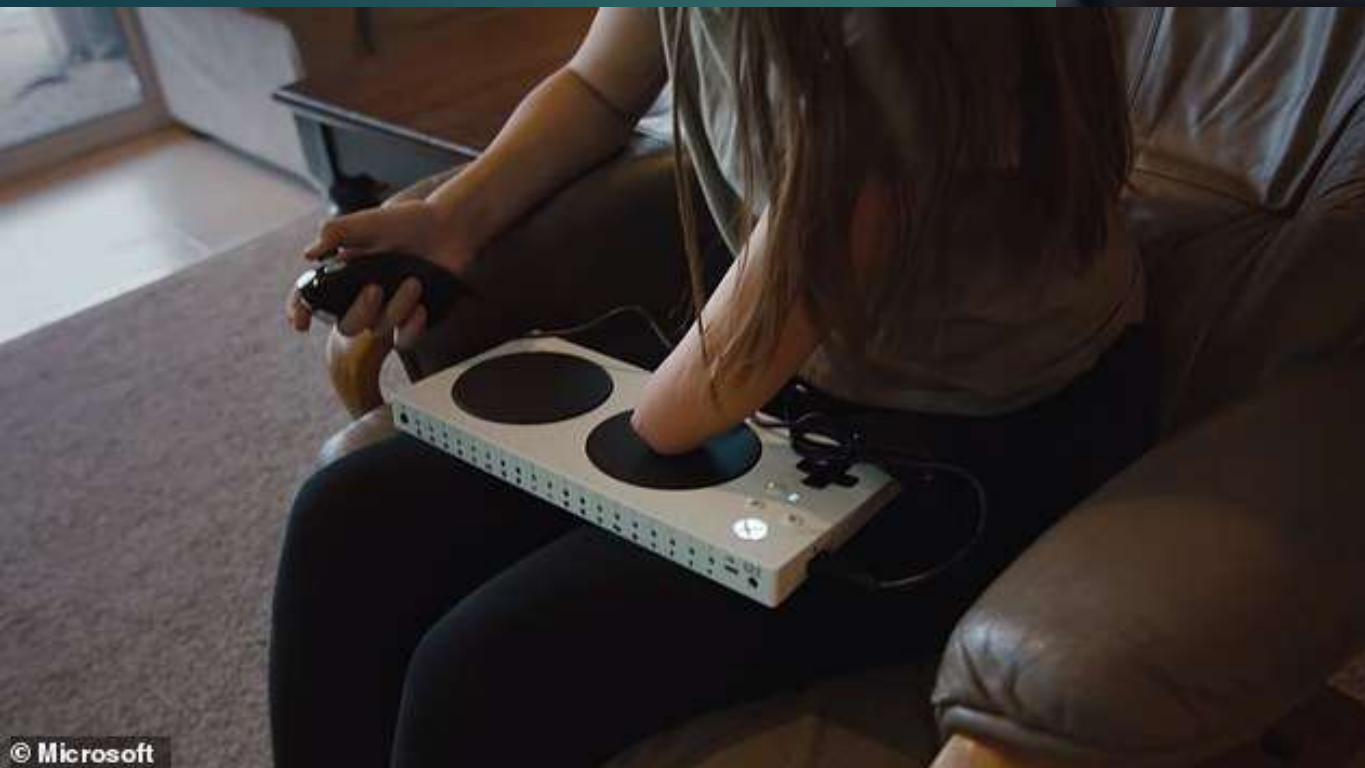


He does have fingernails

Grover: symbrachydactyly

- ▶ Nubbins
- ▶ Puckered skin
- ▶ Foreshortened fingers OR APLASIA

Jordan and Sean



Amelia and Hemimelia

Taylor



Ulnar Longitudinal Deficiency

- ▶ Loss of digits
- ▶ Synostosis of digits
- ▶ Likely fusion of ulna to humerus at elbow

Shaquem



Achiria

- ▶ Per reports he had amniotic band syndrome resulting in amputation of the hand at 4yo

Owen



0:05 / 1:00



Escobar Syndrome

- ▶ Form of arthrogryposis
- ▶ Multiple pterygia

References

- ▶ Rayan, GM & Upton, J. Congenital Hand Anomalies and Associated Syndromes. Springer Berlin 2014.
- ▶ https://embryology.med.unsw.edu.au/embryology/index.php/Lecture_-_Limb_Development
- ▶ <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