Don't Forget The Bubbles

WRIST EXAMINATION & PATHOLOGY

Learners Guide

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PRE-READING FOR LEARNERS

Please watch/read the following material prior to the session

Anatomy and Common injuries:
https://litfl.com/bscc/clinical-anatomy/hand-anatomy/

https://litfl.com/bscc/clinical-anatomy/hand-and-wrist-injuries/

https://dontforgetthebubbles.com/wrist-torus-and-greenstick-fractures/

https://dontforgetthebubbles.com/scaphoid-fractures/

Examination:
https://geekymedics.com/hand-examination/

Management:
www.rch.org.au/clinicalguide/guideline_index/fractures/Distal_radial_physeal_fractures_Emergency_Department_setting/

DFTB below elbow Backslab application:

CASE SCENARIO 1

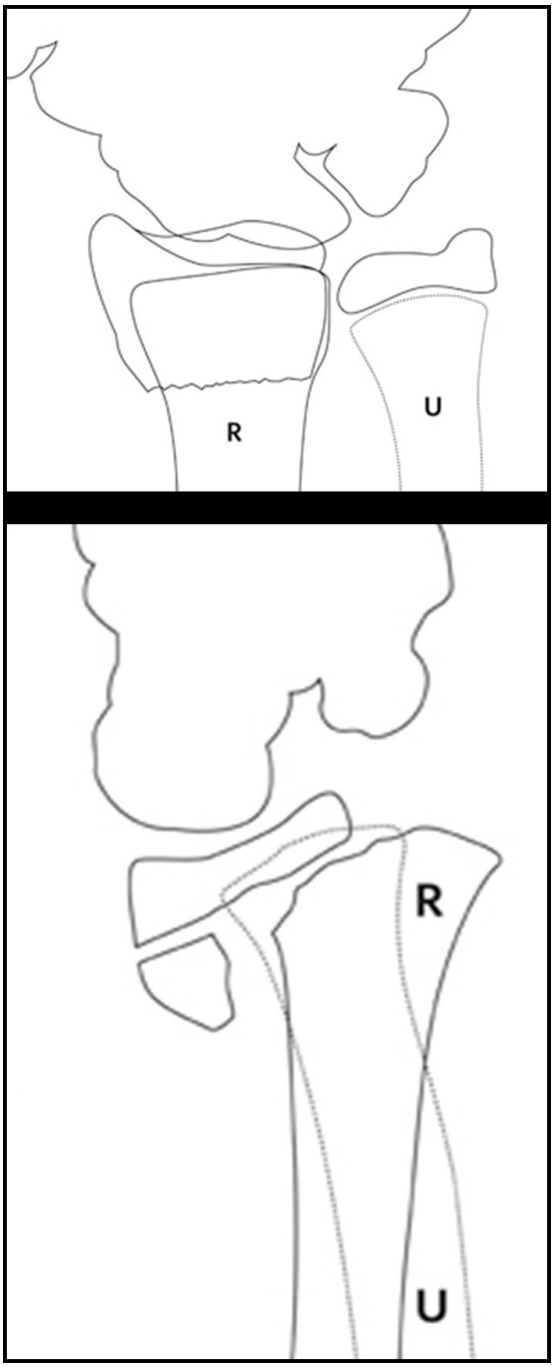
An 8 year old boy is brought to ED with his father. He had been outside roller-skating but fell over onto the concrete patio within the last hour. He is complaining of pain in his wrist and has difficulty moving it.
An X-Ray was done following triage:

From Radiopedia

What would be your approach to examining his injury?
What type of fracture do you suspect and how would you differentiate on X-ray?
What type of immobilisation would you use?

CASE SCENARIO 2

A 12 year old girl is brought to ED with her mother. She was jumping on her trampoline but fell out. She had immediate pain and has not been able to use her left hand since. Her mum gave her some paracetamol and ibuprofen prior to arrival. An X-Ray was then done and is as follows:



Discussion:

What does this fracture show?

How would you further classify this type of fracture?

How would you manage these fractures?

Mum asks you if she should let her 6 year old daughter use the trampoline. What is your advice?

ADVANCED CASE SCENARIO 1

A 14 year old boy was skateboarding and dismounted. Landing on his outstretched hand. He had significant pain in his wrist around the distal radius but following analgesia in the emergency department an X-ray was undertaken. No fracture was identified and he was reassured that he had sustained a soft tissue injury. He was discharged with RICE advice.

Questions:

What are thoughts surrounding soft tissue injuries in children and how should they be defined and managed ?

Are there any other pathologies you should consider when X-rays appear normal?

Four weeks later he is still in pain - The original X-ray is re-reviewed

From Radiopedia

ADVANCED CASE SCENARIO 2

A 13 year old girl is brought to ED following a fall from a tree she has significant pain, swelling and deformity of the distal shaft of the radius.
Analgesia is given and she is taken to X-ray

From Radiopedia

Questions:
What type of fracture has occurred?
How would you manage this fracture?

QUIZ (5 MINUTES)

Question 1.

Which of the following is false?

A: A buckle fracture occurs due to longitudinal force along long bone
B: Greenstick fractures do not have any breach in the bone cortex
C: A buckle fracture will have an intact cortex
D: A torus fracture is always circumferential

Question 2.

Which nerve is most likely to be affected by a lunate dislocation?

A: Radial nerve

B: Ulnar nerve

C: Median nerve

D: All of the above

Question 3.

Which statement is true?

A: A Galeazzi fracture-dislocation is one in which the radius is fractured and also dislocated from the radioulnar joint.

B: Scaphoid fractures always require surgical intervention

C: The ulnar nerve may be affected following a Galeazzi fracture-dislocation

D: Bayonet apposition is when the two portions of a fracture are aligned end to end with some angulation

Finish – Infographic of take home tips (5 minutes)

1. Varius wrist fractures are unique to the paediatric population including buckle, Torus and greenstick fractures. Clinical examination determines the appropriate imaging (a wrist or a scaphoid series).

2. Start examinations with the unaffected side. This not only acts as a comparison but also to minimise fear and establish rapport.

3. Rock paper scissors, ok sign and turn the key always helps its fun and quickly assesses function and neurovasculature

4. Plain radiographs miss up to 25% of scaphoid fractures across all age groups. If the scaphoid views appear normal it is mandatory that the patient is followed up.

5. Urgently refer to ortho when:

- open fracture
- signs of neurovascular compromise
- over 10 degrees of angulation of the fractured segments
- Any difficulty in reduction
- Associated fractures in the same or opposite limb

REFERENCES

1. https://litfl.com/bscc/clinical-anatomy/hand-anatomy/ video series on hand and wrist injuries

2. https://teachmeanatomy.info/upper-limb/joints/wrist-joint/

3. https://teachmeanatomy.info/upper-limb/vessels/arteries/

4. https://www.nysora.com/techniques/upper-extremity/wrist/wrist-block/

5. https://geekymedics.com/hand-examination/

6. https://radiopaedia.org/cases/buckle-fracture

7. Slaar A, Walenkamp MM, Bentohami A, et al. A clinical decision rule for the use of plain radiography in children after acute wrist injury: development and external validation of the Amsterdam Pediatric Wrist Rules. Pediatr Radiol. 2016;46(1):50-60. doi:10.1007/s00247-015-3436-3

8. Davidson AW. Rock-paper-scissors. Injury. 2003;34(1):61-63. doi:10.1016/s0020-1383(02)00102-x

9. https://www.peminfographics.com/infographics/rock-paper-scissors-ok

10. https://force.octru.ox.ac.uk/

11. https://www.rch.org.au/fracture-education/growth_plate_injuries/Physeal_growth_plate_injuries/

12. https://www.rch.org.au/clinicalguide/guideline_index/fractures/Distal_radius_and_or_ulna_metaphyseal_fractures_Emergency_Department_setting/

13. https://first10em.com/ebm-lecture-handout-6-salter-harris-1-injuries/

14. https://www.researchgate.net/figure/Salter-Harris-type-III-fracture-in-a-15-year-old-male-patient-Frontal-radiograph-of-the_fig11_260716406

15. Elvey M, Patel S, Avisar E, White WJ, Sorene E. Defining occult injuries of the distal forearm and wrist in children. J Child Orthop. 2016;10(3):227-233. doi:10.1007/s11832-016-0735-7

16. http://gppaedstips.blogspot.com/search/label/Injury
17. https://www.rospa.com/leisure-safety/Advice/Trampoline

18. Little, Jason & Klionsky, Nina & Chaturvedi, Abhishek & Soral, Aditya & Chaturvedi, Apeksha. (2014). Pediatric Distal Forearm and Wrist Injury: An Imaging Review. Radiographics : a review publication of the Radiological Society of North America, Inc. 34. 472-90. 10.1148/rg.342135073.

19. https://litfl.com/bscc/clinical-anatomy/hand-and-wrist-injuries/

20. https://pedemmorsels.com/scaphoid-fracture/

21. Shaterian A1, Santos PJF1, Lee CJ1, Evans GRD1, Leis A1. Management Modalities and Outcomes Following Acute Scaphoid Fractures in Children: A Quantitative Review and Meta-Analysis. Hand (N Y). 2019 May;14(3):305-310. PMID: 29078712.

22. Porter J, Porter R, Chan KJ. Scaphoid Fractures in Children: Do We Need to X-ray? A Retrospective Chart Review of 144 Wrists. Pediatr Emerg Care. 2018 Mar 12. PMID: 29538268.

23. https://www.orthobullets.com/hand/6034/scaphoid-fracture

24. Al-Ajmi TA, Al-Faryan KH, Al-Kanaan NF, et al. A Systematic Review and Meta-analysis of Randomized Controlled Trials Comparing Surgical versus Conservative Treatments for Acute Undisplaced or Minimally-Displaced Scaphoid Fractures. Clin Orthop Surg. 2018;10(1):64-73. doi:10.4055/cios.2018.10.1.64

25. https://www.rch.org.au/clinicalguide/guideline_index/fractures/Galeazzi_fracturedislocations_Emergency_Department_setting/

26. https://www.paediatricpearls.co.uk/wp-content/uploads/minor-injuries-series-wrist.pdf

27. Clinical Anatomy –hand, wrist (palmar aspect/flexors) Armando Husudungan https://www.youtube.com/watch?v=3aIHxXqKzcU

28. http://www.emdocs.net/hand-expedited-examination-key-points-regarding-ed-diagnoses/

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