Pediatric Injuries/Fractures

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INTRODUCTION

- Incidence
- Anatomy of the Growing Bone
  - Injury Patterns
- What can we X-ray
What makes children susceptible to fractures?

Children tend to participate in spontaneous exercise...
PEDIATRIC FRACTURES INCIDENCE

• Approximately 20% of children who seek attention for injury = FRACTURE

• From birth – 16 years, chance of fracture
  – Boys 42%
  – Girls 27%

• Most commonly involved sites:
  – Distal radius, Hand, Elbow, Clavicle, Radius, Tibia
INJURY PATTERN IN GROWING BONES

- Bones tend to BOW rather than BREAK
- Compressive force = Torus/Buckle fracture
- Force to one side of bone = Greenstick Fracture
GREENSTICK FRACTURE
X Ray – Expanded practice
If Point tenderness and/or clear deformity of limb with significant swelling & decreased ROM.

- Clavicle
- Humerus
- Elbow
- Radius/ulna
- Wrist
- Hands/fingers
- Tib/Fib
- Ankle
- Foot/toes
CLAVICLE FRACTURES

• Most occur in the middle third of the bone – 80%
• HISTORY – Generally FOOSH, fall on shoulder, direct trauma
CLAVICLE FRACTURE
EXAMINATION

• Compare with unaffected side
• Mechanism of injury –
• Pain with any shoulder movement, holds arm to chest
• Point tenderness over fracture
• SubQ crepitus
• Often obvious deformity
Shoulder Dislocation
Humerus Fracture

- Humerus bones thick – less likely to break
- Mid shaft fractures are rare in kids
- Generally caused by a fall
- More likely to see fracture round an elbow
ELBOW

- 10% of all fractures in children
- Most are supracondylar fractures
- Ensure not a pulled elbow
ELBOW FRACTURE EXAMINATION

- Compare with uninjured elbow
- Mechanism of injury
- Gently palpate around elbow – Check limbs above & below
- Check neurovascular status
- **Immobilize elbow before radiographs to avoid further injury from sharp fragments**
  - Flexion 20-30 degrees = least nerve tension
Radius/Ulna Fracture

- Childhood forearm fractures very common following a fall onto outstretched hand
- Young children – Likely to have sustained greater injuries
Distal Radius

- Peak injury time coincides with peak growth time
  - Boys 13- 14
  - Girls 11- 12
DISTAL RADIUS
Examination

- Mechanism - Most injuries result from FOOSH
- Compare with unaffected limb
- Check sensation: CWSP
- Examine elbow (supracondylar) and wrist (scaphoid)
Wrist Fractures

- 8 small carpal bones in the wrist
- Rare in children under 12 years
- Scaphoid fractures most common wrist fractures in adolescents
SCAPHOID FRACTURE
Hand injuries

- Occur in small bones fingers (phalanges)
- long bones (metacarpals).
- Caused from a twisting injury, a fall, a crush injury, or direct contact in sports.
Hand Injuries Examination

- Swelling
- Tenderness
- Deformity
- Inability to move the finger
- Shortened finger
- Form a fist
- Depressed knuckle
TIBIA/FIB INJURY

- Tibia and fibula fractures often occur together
- Mechanism: falls and twisting injury of the foot
TODDLER’S FRACTURES

- Children younger than 3 years old learning to walk
- No specific injury notable most of the time
- Child refuses to weight bear on affected leg
Ankle Injuries

• Typically occur during sports or vigorous play
• Sports involving lateral motion and jumping like basketball = higher risk for ankle injuries.
• Inversion & Eversion injuries
OTTAWA ANKLE RULES

A series of ankle X-ray films is required only if there is any pain in malleolar zone and any of these findings:
- Bone tenderness at A
- Bone tenderness at B
- Inability to bear weight both immediately and in emergency department

A series of foot X-ray films is required only if there is any pain in mid-foot zone and any of these findings:
- Bone tenderness at C
- Bone tenderness at D
- Inability to bear weight both immediately and in emergency department
5th Metatarsal Fracture
Foot Injuries

• Most foot fractures in kids are minor
• Calcaneal fractures - after falls
• Tarsal fractures – ? X-Ray
• Site of pain- point tenderness
Examination of the injured child
The Basics

• History of Trauma?
• Look – Swollen, Red,
• COMPARE TO OTHER SIDE
• Check limbs above & below
• Feel- CWSP? Tenderness? Specific point?
• Move – able to move Active/Passive
• Does the story fit the injury?
Xray Requests

- Mechanism & Injury
- Point Tenderness?
- Previous injury
- Rule out fracture
- Biggest error on x-ray requests?
XRAY REQUESTS

- REMEMBER - Anatomically and radiographically, the forearm is not the wrist and the wrist is not the hand
- STATE – The precise anatomical part to be examined radiographically.
- Do not use an X-Ray as a substitution for a proper & thorough examination.
CONCLUSIONS

- Nearly 20% of children with injury have a fracture
- Most important factors: patient age / mechanism of injury / associated injuries
Apprehensive/questions?