Is that Bad? What PCPs (& Parents) Need to Know about Fractures

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Practice Changes I Hope You Make

1. X-ray entire bone and adjacent joints
2. Refer fractures needing surgery to pediatric orthopaedists/ a children’s hospital
3. Consider managing selected fractures in your office
Common FOOSH Fractures

- Image entire bone and adjacent joints
- Can get both wrist and elbow fractures at same time

Children Under 10 Years Rarely Get Sprains

- Ligaments usually attached to epiphysis on at least one side of joint
- Virtually as strong as those in adults
- Excessive force usually results in fracture
Failure to make diagnosis

- Failure to promptly recognize complications
- Failure to communicate adequately with parents

Case #1 Julia

Julia is 10 years old. Her mom calls and says, “Julia just fell off the balance beam at gymnastics practice and hurt her elbow.”

What should I do?

What should you tell her?
You Tell Mom

a) Put some ice on it and see how it is tomorrow
b) Come to the office for examination and possible X-rays
c) Go to the closest urgent care/emergency room
d) Go to a children’s hospital emergency room

What Questions Might You Ask Before Making Recommendations?

- How much pain is she in?
- What does the elbow look like?
- Can she move her elbow on her own?
- Can she move her fingers?
Suspect Possible Fracture

- Pain
- Swelling
- Loss of function

Beware Delays in Seeking Treatment

- Could be tip off to non-accidental nature
- Make sure story is consistent
Evaluation of Possible Fracture

- Kneel down
- Child on parent’s lap
- Encourage active motion
- Inspect and palpate opposite extremity first
- Palpate area of concern last
- Neurovascular check

Who Needs X-rays?

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>Obvious deformity?</td>
<td>Yes</td>
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<tr>
<td>Loss of function?</td>
<td>Yes</td>
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<tr>
<td>Still hurts next day?</td>
<td>Yes</td>
</tr>
<tr>
<td>Every bump and bruise?</td>
<td>No</td>
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Radiographic Evaluation

Get perpendicular views of entire bone and adjacent joints

Comparison Views

• Weigh risk and cost vs. benefit
• Sometimes helpful at elbow
• Try to review initial images with someone else before ordering them
Referring a Child with a Fracture

• Try to keep NPO if reduction or surgery may be needed
• Try to send copies of X-ray films (or CD), not just report
• Local ER vs. children’s hospital

Fractures Needing Emergent Referral

• Open fractures
• Abnormal neurovascular findings
• Severely displaced fractures tenting skin
Where to Refer?

- Urgent care center
- Local hospital emergency room
- Children’s hospital emergency room

Where to Refer Considerations

- Convenience: proximity, waiting time
- Facilities: child friendly (attitude, resources-imaging, soft goods)
- Personnel
  - Knowledge of and experience with children
  - Pediatric injury assessment – exam and imaging
  - Pediatric injury management – splinting, sedation
Emergency Room

- Julia is initially seen in the local hospital ER
- Found to have an elbow dislocation with an intra-articular fragment
- Transferred that night to a children’s hospital for care

Surgery

- Surgery for her broken elbow at the children’s hospital the next morning
- Sent home that evening in a cast
2AM – Julia’s Mom Calls

Julia won’t stop crying.
I’ve given her the dose of pain medicine her doctor said to take.
I can’t reach her orthopaedic surgeon.
What should I do?

What Should You Tell Mom?

a) Give Julia a bigger dose of her pain medicine
b) Add a second over the counter pain medication such as ibuprofen
c) Go to the nearest urgent care/emergency room
d) Go back to the children’s hospital ER
What questions might you ask mom before making your recommendation?

- Can she move her fingers?
- Can she straighten them out all the way?
- What color is her hand compared with the other one?
- Does her hand look swollen?
- Does she cry more if you try to straighten her fingers out?
Failure to make diagnosis

Failure to promptly recognize complications

Failure to communicate adequately with parents

Compartment Syndrome
Compartment: anatomic space of limited volume

Extremity Compartments
- Forearm
- Hand
- Leg
- Foot
- Thigh

- Swelling or edema leads to increased pressure
- Increased pressure reduces perfusion
- Ischemic tissue swells
Compartment Syndrome

Tight splint or cast can convert injured limb into a compartment!

- Treatment is immediate surgical decompression
- Six hours of warm ischemia = dead muscle

Compartment Syndrome: What to Look For

Severe pain on passive stretch

Firm feeling of region on palpation not accurate

May still have distal pulses and capillary refill
Increasing Pain in Cast

- Don’t wait until morning
- If in doubt, have someone bivalve or remove cast
- Can always re-reduce fracture later

Other Less Dangerous Cast Problems

Cast Is Cracked or Broken

- Is the child comfortable?
- If yes, then wrap it with duct tape (!) and come in the next morning
Failure to make diagnosis

Failure to promptly recognize complications

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Case #2 Dmytro

After the doctor took the cast off Dmytro’s arm, it’s still crooked. I can’t believe he left it like that.
Fracture Remodeling

- Best in plane of motion
- Better when fracture close to joint
- Better in younger children
Case #3 Zikrullah

The orthopaedic surgeon didn’t even put Zikrullah’s broken leg in a cast, just a boot with Velcro. You could have done that yourself and then I wouldn’t have had to take another morning off from work. What’s with that?

Unique Fractures in Children

Incomplete Fractures

- Plastic deformation (bend)
- Torus (buckle) fracture
- Greenstick (incomplete) fracture
Toddler’s Fracture

- Variable tenderness and swelling
- Inspect both AP and lateral radiographs carefully

Torus (Buckle) Fracture

- Failure of bone in compression
- Occurs in metaphysis (most porous)
Buckle Fracture Management

- Wrist splint x 4 weeks
- No need for follow up visits or X-rays
- Validated in multiple studies

Buckle Fracture Distal Tibia

- Can also be managed with a splint
- Leg splints not always as available as wrist splints
Children vs. Adults

Fracture Management

- Faster healing
- Immobilization better tolerated
- Greater remodeling potential
- Less able to use aids

Fracture Assessment

- Inspect opposite extremity, palpate towards suspicious area
- Record neurovascular status when possible
- Get X-rays of entire bone and adjacent joint in 2 planes
- Consider comparison views
Common Pitfalls in Pediatric Fractures

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