MANAGEMENT OF TRAUMATIC HAND INJURIES IN SPORT

Katherine “Katie” Faust, MD
None
THE ATHLETE

- Children are hard to figure out
- Parents are not always better
- Don’t Assume
  - Maintain high index of suspicion for the worst
Fractures & Dislocations
Sprains & Strains
Wounds & Lacerations
Burns, Bites, & Infections

INTRODUCTION
FRACTURES AND DISLOCATIONS
FRACTURE MYTHS PART 1

‘All childrens fractures will remodel…’
“If they can move it, they didn’t break it…”

Always get the X-Ray!
FRACTURE MYTHS PART 3:
INITIAL XRAYS ARE THE WHOLE STORY

- Presentation – clinically+, XR-
  - Treatment - cast
FRACTURE MYTHS PART 3: INITIAL XRAYS ARE THE WHOLE STORY

3 weeks later…
FRACUTRES: INITIAL MANAGEMENT

• Make the diagnosis
• At least, appreciate the possibility
• Re-align if necessary
  – Visible deformities
  – Not true emergency
• Immobilize & protect
• Emergencies?
  – Open fractures
  – Ischemia
  – Compartment syndrome
IMMOBILIZATION

• Immobilize the bone above/below joint injuries
• Immobilize the joint above/below shaft injuries
FRACTURES:
PROVISIONAL IMMOBILIZATION

- Plaster splints or casts
- Must be more restrictive in children
  - Short or long arm splints/casts
  - Include adjacent digits or all fingers if easier
- Safe position for the hand: ‘intrinsic plus’
- Remember, this is temporary
  - Follow up within a few days
DIFFICULT FRACTURES: PERIARTICULAR FRACTURES

- Treated like any articular fracture
  - Displacement leads to arthritis
- Follow up should generally be within a few days

DIFFICULT FRACTURES:
DISTAL CONDYLAR FRACTURE
DIFFICULT FRACTURES: SEYMOUR FRACTURE

- Mistaken for a nail plate avulsion
  - Open peri-physeal fracture
- Consequences if maltreated
  - Osteomyelitis
  - Nail deformity
- X-Ray and suspicion are key
Matrix is lacerated at the fracture site under nailfold

Open treatment is required

- Nailplate is removed
- Nailfold is elevated
- Fracture is irrigated, then reduced
- Matrix is repaired
- Nailplate or other is replaced under the fold.
SEYMOUR FRACTURE: TREATMENT

- Pinning is optional
- Antibiotics for 48 hours
- Casted
Difficult Fractures: Scaphoid

- Possibility of the injury is not always appreciated
- When it is...
  - Lots of false positives (84%)
- Standard Xray...
  - 77% sensitive
  - 37% specific
- Real consequences when untreated
  - Non-union
  - Pediatric post-traumatic arthritis

CASE: 15 YO FOOTBALL PLAYER

Spring 2014

Fall 2014
No consistent mechanism of injury

Symptoms
- Epicenter of soreness is radial-carpal
- Distinguishable from distal radius

Findings
- Inconsistency is the norm
  - The hand/wrist is often visually unremarkable
- Maneuvers
  - Snuff box tenderness
  - Distal pole (tubercle) tenderness
  - Compression test

PEDS SCAPHOID: EVALUATION

PEDS SCAPHOID: FINDINGS

Snuffbox tenderness

Distal pole tenderness
Standard wrist Xrays are insufficient
   - 77% sensitive; 37% specific
   - Adding ulnar deviation views better
     - 83% sensitive; 70% specific
   - Adding pronated oblique even better
     - 94% sensitive; 100% specific
Fat pad sign completely unreliable
Still, up to 20% of scaphoid fractures present with negative initial x-rays

PEDS SCAPHOID: STUDIES

CASE: STANDARD SCAPHOID SERIES

PA

Lateral

PA – ulnar deviation

45° pronation oblique
All suspected or proven fractures are immobilized

Ongoing questions
- Long arm v short arm
- Thumb immobilized vs. free

Specifically suspected fractures
- Repeat radiographs in 2-3 weeks
  - Advanced imaging if still suspicious but Xrays negative
- Acute MRI or CT??????

PEDS SCAPHOID: INITIAL TREATMENT

CASE: 9 YO WITH SNUFFBOX TENDERNESS

Initial Xray
CASE: 9 YO WITH SNUFFBOX TENDERNESSNESS

Initial Xray

Initial MRI
MCP DISLOCATIONS

- **Anesthesia, not analgesia**
  - Local block
  - Sedative if necessary

- **Reduction**
  - Insufflate joint with fluid
  - flex the ray
  - don’t pull… do push

- **May require surgery**
  - Urgent
SPRAINS & STRAINS

If they cannot move it, think about a tendon injury.
VOLAR PLATE AVULSION FX

- ‘...intra-articular fx of the base of the middle phalanx...displaced...’
  - In reality...a sprain
- The ‘jammed finger’
- Rx: buddy straps
COLLATERAL LIGAMENT AVULSION
CENTRAL SLIP AVULSION-FRACTURE – “BOUTONNIÈRE”

- Looks like any other sprain, but
  - Tendon injury
- Requires PIP extension splinting or pinning for 4-6 weeks
‘JERSEY’ FINGER
Avulsion of the deep flexor tendon from its distal phalanx insertion

- Reaching, grabbing, pulling
  - Football, rugby, wrestling
- Ring finger typically

‘JERSEY FINGER’
A laceration does not have to go deep or be large to injure a critical structure

- Flexor tendons lie along volar ½ of the digit, and within 1 cm of the palmar surface
- Extensor tendons are within mm’s of the dorsal surface
- Nerves/arteries lie just lateral to the tendons in the palm and hand
LACERATION MANAGEMENT

- Assess for injury to critical structures
  - Examination is sufficient!!!
- Infection prophylaxis
  - *Thorough* wound irrigation & debridement
    - Typically accomplished in ED unless contamination is severe
  - Antibiotics for approximately 48 hours
  - Td prophylaxis as required
- Wound management
  - Simple closure with *absorbable* suture
  - Immobilization in splint or cast
ASSESSMENT OF TENDONS

- Maintain high index of suspicion
  - It's NEVER pain that prevents mobility
  - There is little role for formal exploration in the emergency department
- Not sure?
  - Refer PROMPTLY to specialist
  - Do not explore unless prepared to do a definitive surgical repair
IS THE NERVE CUT?

- Are nerves near the wound?
- 2-point discrimination best test
  - Not practical in young children
- “Wrinkle test”
  - Immerse hand/finger for several minutes
  - Absent wrinkling, especially if over the ‘finger(s)’ or side of the ‘finger’ is a positive test
- Explore in OR
  - UNLESS there is an easy to reach foreign body

Phelps & Walker, 1977
THE OCCULT LACERATION

- Lacerations near major nerves
- Underappreciated
  - Viable, moving
  - Avoidance activity mistaken for pain
The hand and digits have many ‘pathways’ bringing perfusion

Ischemic hands/digits require
- BOTH digital arteries transected
- BOTH radial and ulnar arteries transected

Assessing circulation
- Color, temperature, capillary refill and compare to neighboring digit or hand
- Pulse oximetry on injured finger or hand/forearm
Compromised circulation is a true emergency

Clear or possible evidence of injury to tendons & nerves should be definitively addressed with 3-10 days

Foreign body?
- Do not advise routine exploration
  - If the FB is easy to remove, then can proceed in ER
- Associated infections require prompt treatment
- It is removed electively when not infected
AMPUTATIONS!!!

First things first… don't freak out
AMPUTATIONS: TREATMENT

- Depends upon:
  - Level of amputation
  - Extent of cleanliness/neatness
  - Soft tissue damage
  - Ischemic time
    - 8-12 hours warm
    - 12-24 hours cold
- Wrap in saline moistened gauze
- Minimize ischemic trauma
  - cool, but not in direct contact with ice
    - place gauze/part in plastic bag
    - place plastic bag in ice bath
- Do not get too caught up in sterility – everything should be clean
AMPUTATIONS: TREATING THE PATIENT

- Standard infectious prophylaxis
- Analgesia/Anxiolysis
- Control bleeding
- Moist dressing on stump
Time is a factor in success of replant
- Transport should be rapid
- Ambulance, air
- Accepting facility/hand surgeon *must clear* prior to transfer!
FINGERTIP CRUSH INJURIES

Composite tissue injury
- nail and nail matrix
- distal phalange
- pulp and skin
FINGERTIP CRUSH TREATMENT

- Local anesthesia & sedation
- Repair
  - Remove nail plate
  - Irrigate wounds/bone
  - Repair skin first
    - Absorbable 4-0 or 5-0
    - This usually realigns bone
  - Repair nail matrix
    - Absorbable 6-0
    - Fast absorbing gut
  - Replace nailplate or stent
    - Absorbable 4-0 or 5-0
- Infection prophylaxis
- Immobilize
FINGERTIP INJURIES: WHAT’S WRONG HERE?
SUBUNGUAL HEMATOMA

- < 50% & nail intact
  - No treatment
- > 50% & nail intact
  - Drain only, regardless of extent
  - Abx if there is fracture
- Nail not intact
  - Fingertip crush repair

Roser & Gellman, 1999
THANK YOU!

- Office: 2633 Napoleon Ave, Suite 600
  New Orleans, LA 70115

- Appointments: (504) 899-1000