
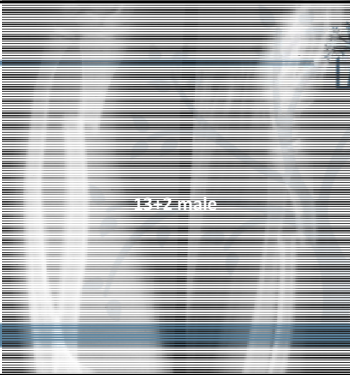



Atlanta Trauma Symposium 2017 


Pediatric Forearm Fractures: Cast, ORIF, What Bone, and How?

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Example



Quick PubMed Literature Search 

Results of Closed Management

- Thomas, et.al, 1975 93%
- Daruwalla, 1979 97%
- Creasman, et.al., 1984 95%
- Carey, Betz, et.al., 1992 94%
- Price, et.al.(non-anatomic)1990 92%

Diaphyseal Forearm Fractures



Principles

1. "The ulna shows you the angulation, the radius shows you the rotation"
2. Diaphyseal fractures **heal more slowly**
3. Malunion **is** a problem

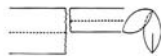


Diaphyseal Forearm Fractures

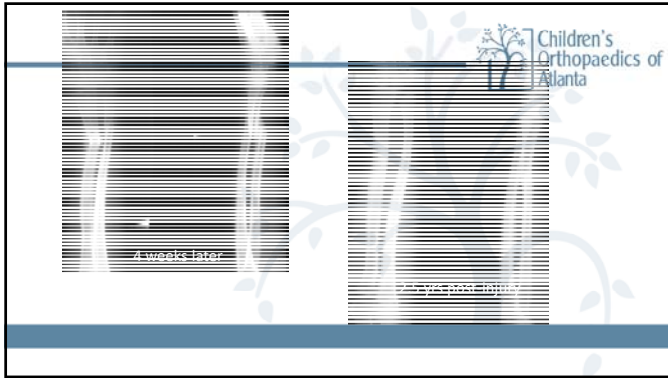


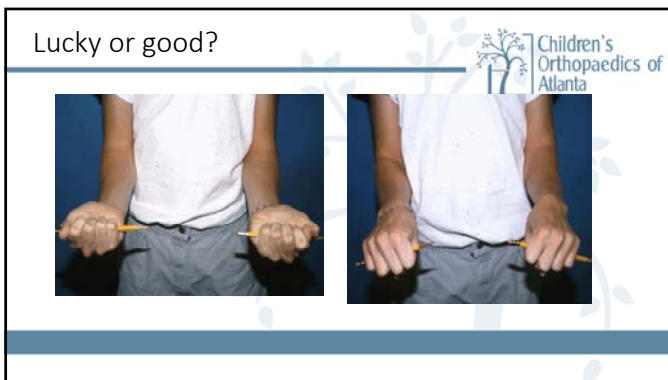
Analyze the rotation

- Demand good AP and lat radiographs
- Compare the width of the cortices




Cross-sectional incongruence






Why would anyone operate ?


- Closed management is difficult
 - Precise understanding of acceptable alignment
 - More explanation to parents
 - Frequent return visits
 - Difficult to change and mold casts in a busy clinic

Diaphyseal Forearm Fractures 

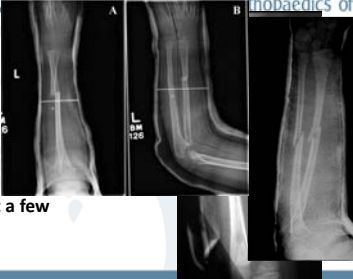
WHAT TO ACCEPT


- Up to 10-20° angulation in kids < 10 y/o
- No more than 10° angulation >10 y/o
- Complete displacement
- 30° malrotation
- Stabilize floating elbow
- Open Fractures
- Monteggia ??



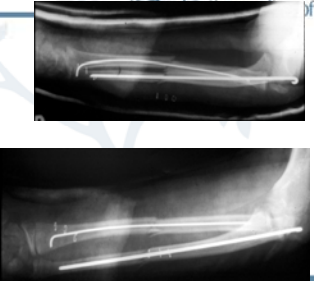
Diaphyseal Forearm Fractures 

- Don't accept a crooked arm
- Straight ulnar border
- Correct rotation /angulation
- Oval long arm cast
- Make a good cast
 - Cast Index <0.81
- Avoid re-fracture: splint or cast a few extra weeks if unsure




IM Fixation 

- Minimally invasive
- Easy
- Avoid multiple passes
 - 2-3
 - Increase risk of Compartment syndrome
- Near anatomic alignment
 - Loss of radial bow ??



Radial Fixation

- Small flexible nail
 - Usually 2.0
- Proximal to Lister's Tubercle
 - Beware of EPL rupture due to buried wire
- Radial insertion
 - Between 1st and 2nd Dorsal compartment
 - APL, EPB and ECRL, ECRB
 - Radial sensory nerve



Ulna fixation

- Proximal and lateral
 - Flexible nail
 - Smaller diameter
- Proximal
 - Flexible nail
 - K wire
 - Rush Rod
 - Locking nail
- Beware of FDP Entrapment



Single Bone Fixation

- BBFA with distal 1/3 fx radius
 - Avoid proximal radius fx
- Acceptable reduction
- Enough time to remodel
 - 8 to 12 year olds
 - At least 2 years of growth
- Older patients treat as adults

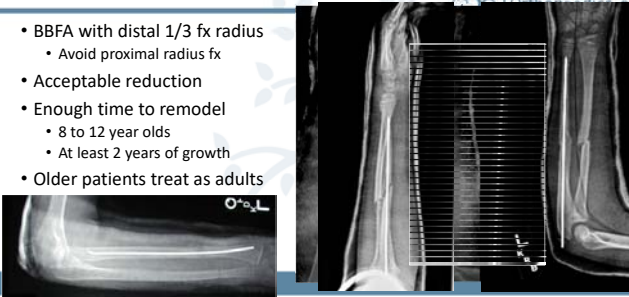



Plate Fixation

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- Advantage
 - Rigid Fixation
 - Complete correction of malrotation
 - Useful within 1-2 years of skeletal maturity
- Disadvantage
 - Larger incisions
 - Cost
 - Increase tourniquet time



Evaluation/Monteggia

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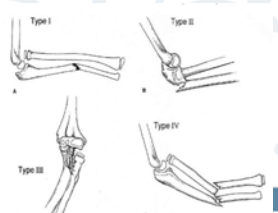
- Forearm views
- Dedicated elbow views



Management

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- Time from initial injury
- Fracture stability
- Age of patient
- Pattern of injury




Management

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Scenario #1

Acute fracture
Usually < 12 y/o
Greenstick ulna




Management

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Scenario #1

Acute fracture
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Management

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Scenario #2

Acute fracture
Unstable ulna
(often >10-12 y/o)



Management

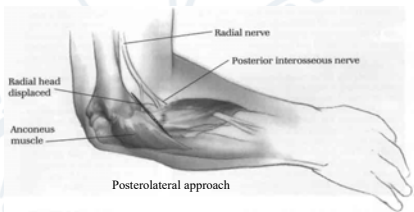
Scenario #2
Acute fracture
Unstable ulna
(often >10-12 y/o)



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Management

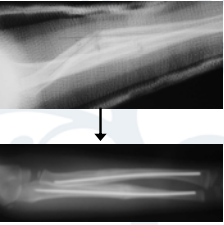
Scenario #3
Acute fracture
Irreducible radiocapitellar joint



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Forearm Fractures – Final Thoughts

- Malunion-most common
 - Loss pronation/supination
- Monteggia
 - Straight ulna/stability
- Refracture
 - 5% within 6 months
- Compartment syndrome 10%
 - Multiple passes
- Tethering of FDP
 - Ulna fx
 - Check rom of fingers intraop



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