

Controversies in the Care of the Pediatric Wrist Fracture

Mark Perlmutter MS MD FICS FAANOS

Katayoun Madani MS MD FICS(Jr)



American Academy of
Neurological and
Orthopaedic Surgeons



XD

Agenda

- Incidence
- Conventional Thinking
- Current thinking
- The Problem
- Importance of Consensus



Incidence



- Most common fracture in children (20-36%)
- 36 fractures per 1000 children per year
- Risk for sustaining a wrist fracture birth – 16yo:
 - Boys: 42 – 64%
 - Girls: 27 – 40%
- > 2,000,000 fractures / year in the US

Conventional Thinking



MMW
ER

- Distal radial physal growth = 75%
- Extensive remodeling potential exists
 - Age until maturity
 - Displacement
- A greater initial deformity can be accepted the longer the physis is open
- Full dorsal displacement in a child <10 can be treated with only immobilization

Current Trends - Treatment Variables

Dependent variables

- Age to maturity and the fracture displacement
- The indications for CR, pinning or ORIF in the context of remodeling are sources of debate

Confounding Variables

- Child's *short term* functional needs
- Parental perceptions and wishes
- Surgeon perceptions
- Risk acceptance

Changing Surgeon Perceptions

Training

- General Ortho v. Ped. Ortho
- General Ortho v. Hand Surgeon
- Hand Surgeon v. Ped. Ortho

Country

- UK:
90% adhere to 1998
- EU:
83% reduce all kids
77% with anesthesia
54% pin even if stable
- US:
71% accept no overlap

The Problem

Historic trends

- Angulation, overlap and rotation <8 yo and >8 yo have been defined
- Mal-rotation limit:
 - < 9yo: <45°
 - >9 yo: <30°

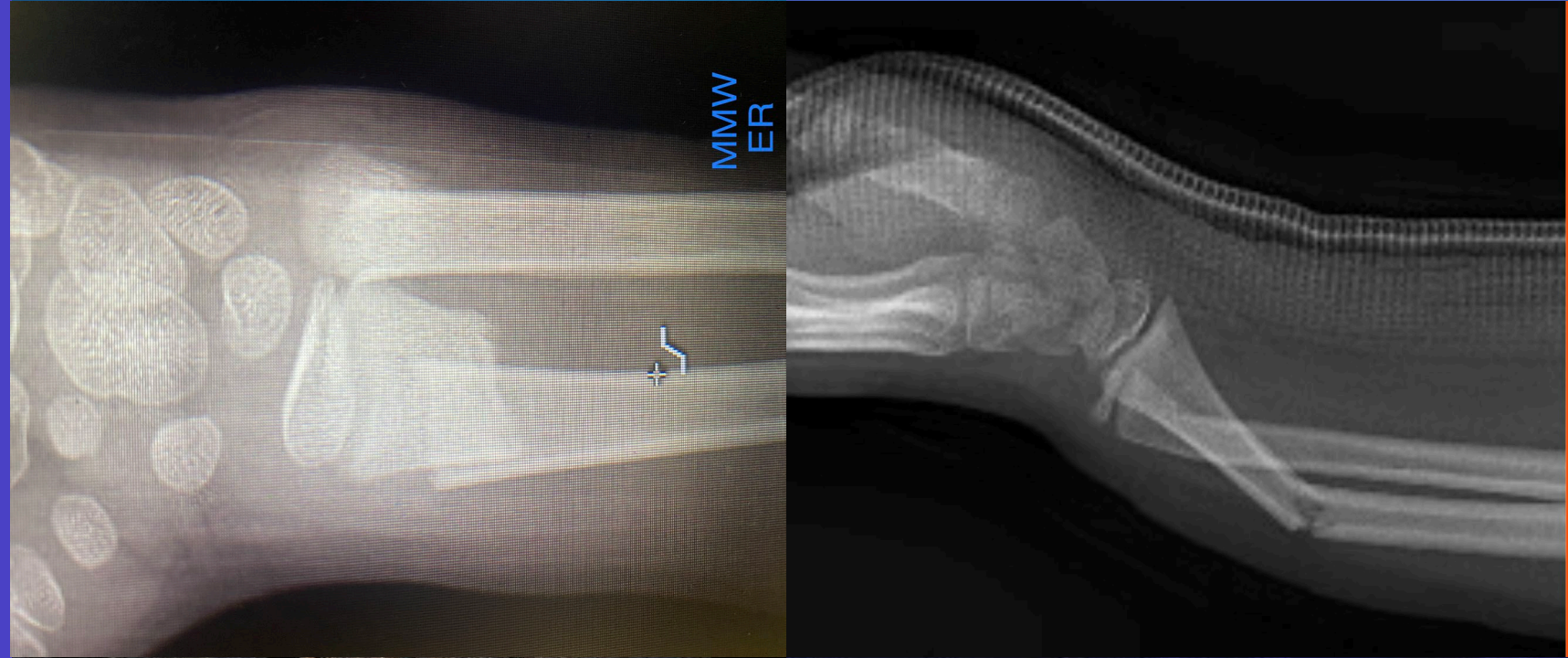
Current thinking

- Mal-angulation accentuates the effect of mal-rotation
- Mal-rotation *never* remodels and is permanent
- < 9yo: <30°
- Mal-rotation progresses w/o fixation

Missing data

- No accurate way to measure mal-rotation pre or post reduction
- **100%** of literature does *not* quantitate supination and pronation in defining “acceptable” outcomes

Fractures with Enhanced Failure Risk



- More likely to undergo instrumentation
- Increased obliquity
- Complete initial displacement
- Radius and ulna fx. at the same level
- Suboptimal reduction (Think DRUJ)

Mal-rotation



- CT: 75% rotated appreciably after the injury was stabilized
- Only a 45° pronation view shows mal-rotation if >5mm cortical step off
- Neither short nor long term compromise has been accurately assessed
- Increasing as a leading cause for closed and open instrumentation

Importance of Consensus



- All specialties are governed by Clinical Practice Guidelines (CPG)
- Mandatory 1st step in developing a CPG

Clinical Practice Guidelines

STRENGTH	STRENGTH OF EVIDENCE	DECISION AIDS	LEVEL
STRONG	2+ HIGH STRENGTH STUDIES ^c CONSISTANT FINDINGS	LEAST IMPORTANT	1
MODERATE	1 HIGH OR 2 MODERATED STRENGTH STUDIES		2 - 3
LIMITED	1+ LOW STRENGTH STUDY ^c CONSISTANT FINDINGS INCONSISTANT EVIDENCE		3 - 4
CONSENSUS	EXPERT OPINIONS ^c NO SUPPORTING EVIDENCE	MOST IMPORTANT	5

Summary

1. There is no consensus, and therefore defining a CPG is impossible.
2. No consensus is a function of lack of meaningful evidence.
3. We need Level 2 or 1 evidence to determine appropriate care.
4. Multi-center prospective data assimilation is required in a RCT.

