

Paediatric Lateral Condylar & Supracondylar fractures

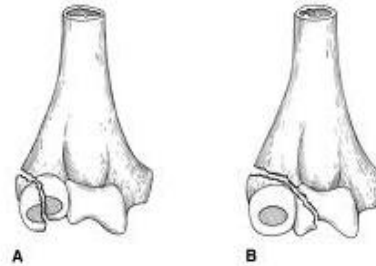
DOA MIDCON 2023

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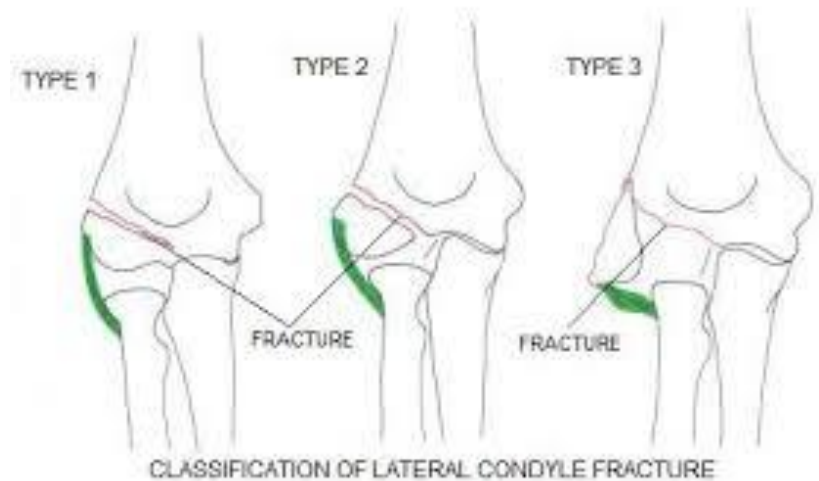
Anatomical Classification: Milch

- Milch I: # line through capitellar-trochlear groove; SH IV; stable; less common
- Milch II: # line extends into trochlea; SH II; unstable because the distal fragment may angulate as well as translate
- May not correlate well with intra-op findings



More useful classification: According to displacement

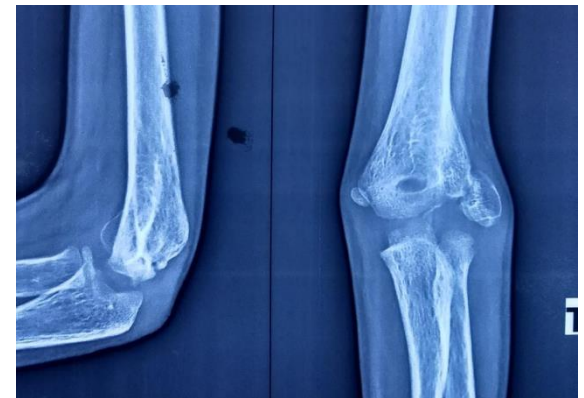
- Un-displaced/ minimally displaced
- Moderately displaced
- Completely displaced and rotated



Others: Jakob-Skaggs/ Song's classification

The Jakob-Skaggs Classification of Lateral Condyle Fractures

Type	Displacement	Treatment
I	Less than 2 mm	Casting
II	2 mm or more, with intact articular cartilage seen on arthrogram	Casting or closed reduction and percutaneous pinning
III	2 mm or more, with disruption of the articular surface	Open reduction and pinning



A Practical Chronological classification

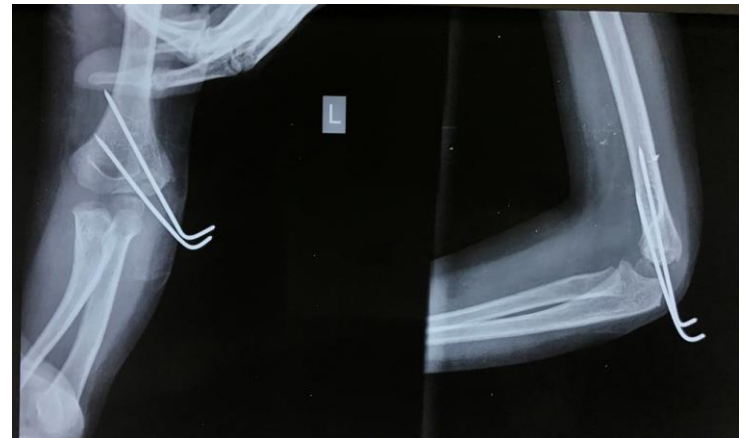
- Acute: reduction and osteosynthesis
- Late Presenting: osteosynthesis in situ
- Non-union: Treatment of non-union, instability, deformity and neurological signs (if present)

Acute (Early): Minimal/Un-Displaced Conservative Treatment: requires regular FU



Acute: Displaced

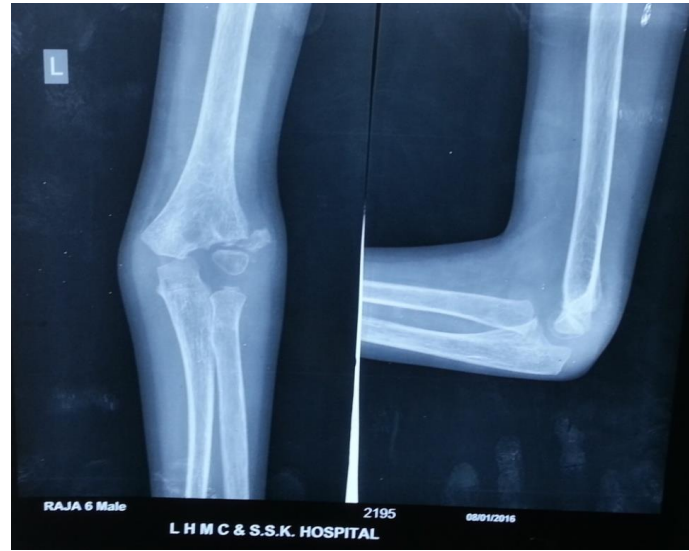
Treatment: Open reduction and Osteosynthesis



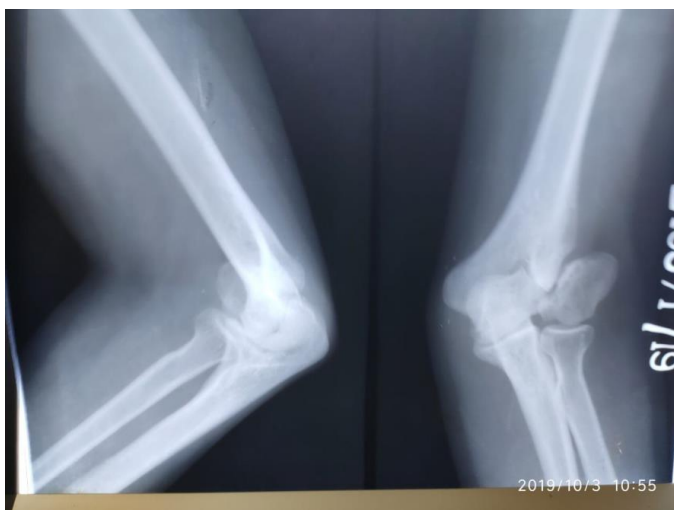
Late Lateral condylar fractures (Untreated/ neglected), 2-12 weeks

Treatment: Osteosynthesis in situ

- Osteosynthesis



Non-union (>12 weeks)

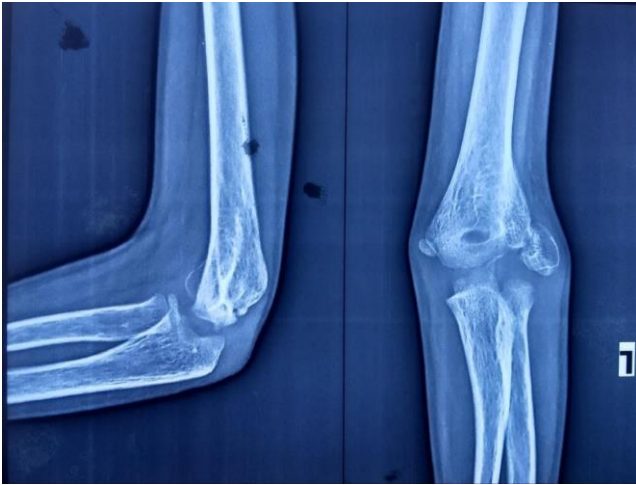


- Pain, Instability, Deformity, Neurology
1. Painless, stable, no deformity, no nerve deficit
 2. Painless, un-stable with apprehension, no cubitus valgus, no ND
 3. Painless, unstable, cubitus valgus, +/- ND

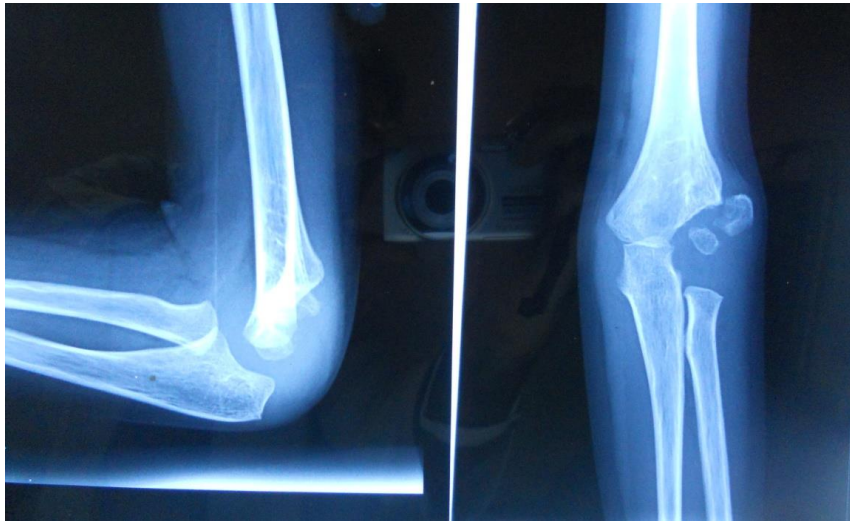
Non-union; painless, stable, no cubitus valgus



Non-union; unstable with apprehension; no cubitus valgus



Non-union; unstable with apprehension; no cubitus valgus



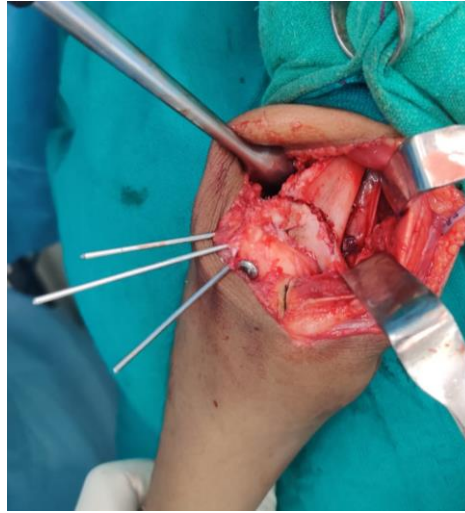
Non-union, with cubitus valgus

1. With Ulnar N palsy
2. Without ulnar N palsy

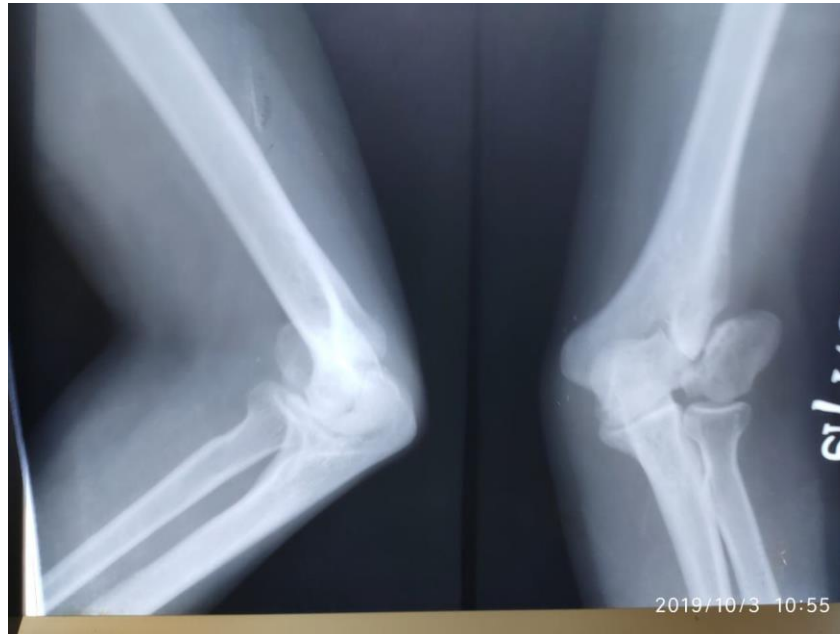


1. Corrective osteotomy+ anterior transposition
2. Osteosynthesis + corrective osteotomy + anterior transposition





Osteonecrosis; Fishtail deformity; non-union



Take home message

- If cast is applied: Close radiographic monitoring, preferably every week for at-least 4 weeks
- Displaced, unstable, un-definable risk: operate
- Late presenting fractures(2- 12 weeks): osteosynthesis
- Established Non unions: osteotomy +/- osteosynthesis +/- anterior transposition

Supracondylar fractures

Extension

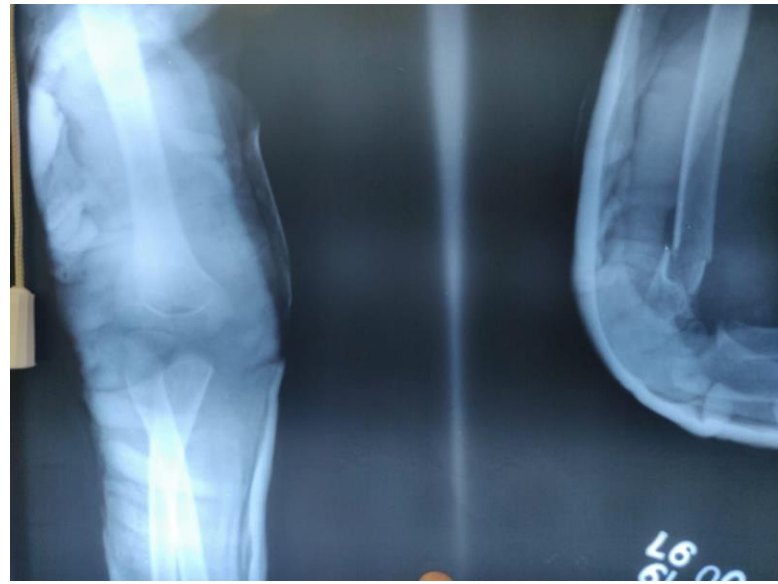
- I- Un-displaced
- II- extension with intact posterior periosteum
- III- complete periosteal disruption. 75%-postero-medial



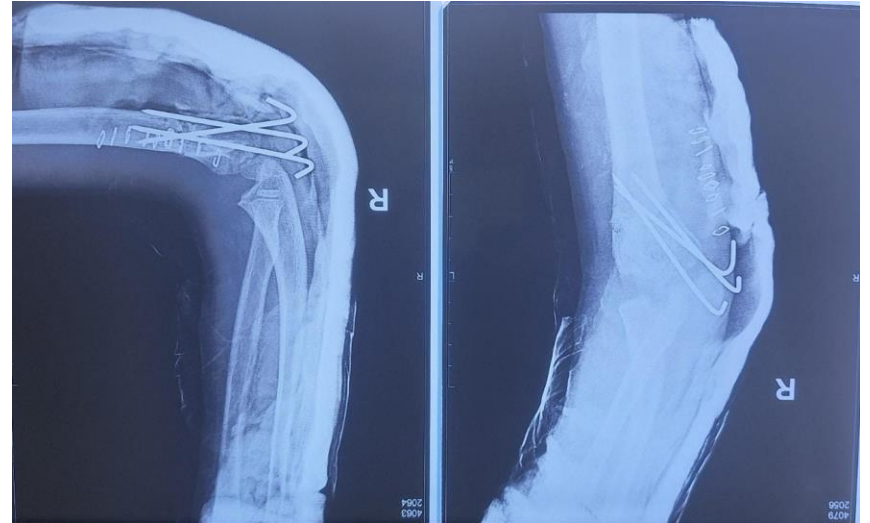
Flexion of distal fragment

Type I & II



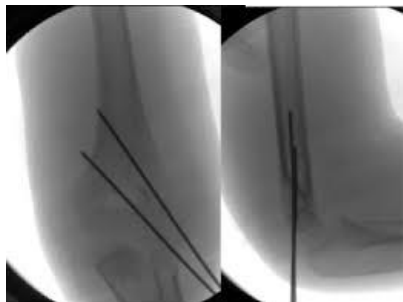


Type III





Pin configuration & Number



Tips for CR

- Elbow on table: not on Flouroscope
- Traction in some flexion: generally only this is required
- Take AP view on Traction (This avoids Jone's view)
- Translation corrected by moving the distal fragment directly
- Extension corrected by direct thumb pressure over olecranon and subsequent flexion
- Varus/ valgus alignment neutralized by forearm movement
- Pronation may assist reduction by placing tension on intact medial periosteum and closing the lateral column

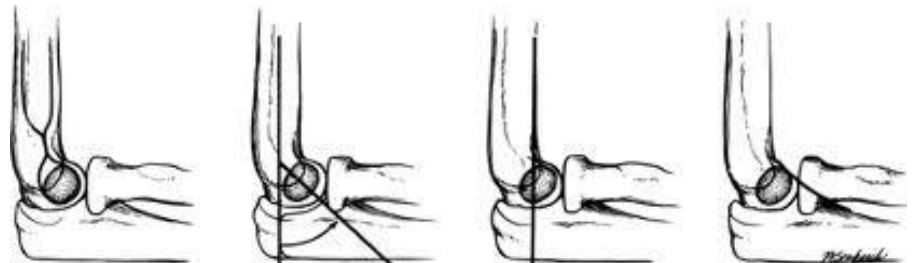
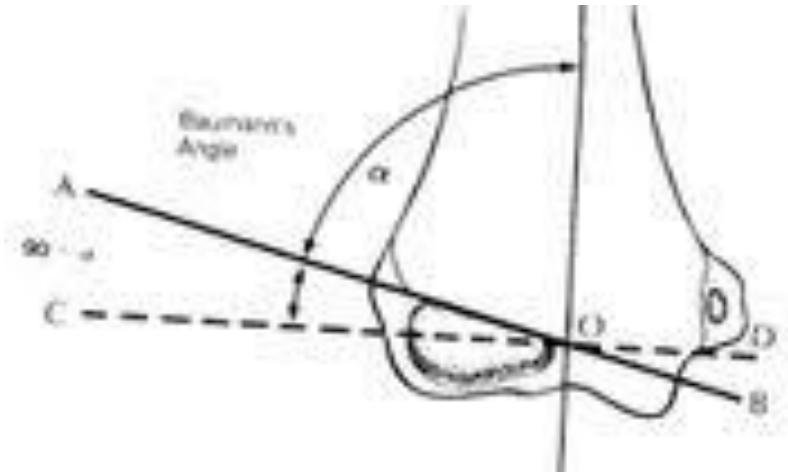
Assessment of reduction

Accuracy of reduction in lateral (sagittal) and AP (Coronal) views

Coronal:

- Baumann angle- (at least 10)
- Intact lateral & medial columns
- Metaphyseal- diaphyseal angle

Sagittal: Anterior humeral line



Open Reduction

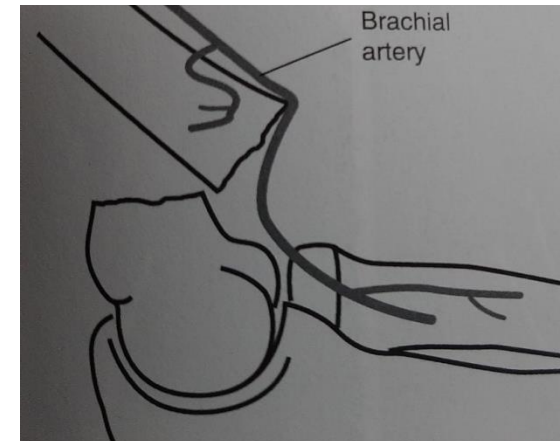
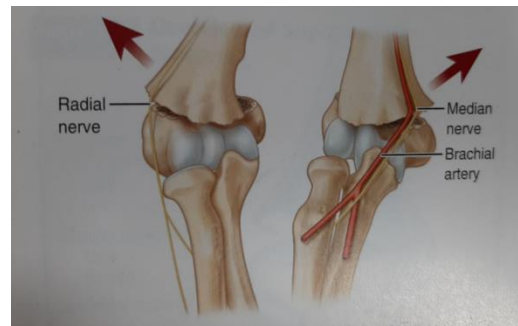
- When the surgeon is not able to reduce the fracture by closed means
- When there is soft-tissue entrapment (i.e. muscle, median nerve, brachial artery) or
- When a cold hand remains without perfusion after an attempt at closed reduction has been performed.

Flexion type



Vascular & N assessment

- Class I - well perfused (warm and red) with radial pulse
 - Class II – well perfused but radial pulse absent
 - Class III – poorly perfused (cool and blue or blanched) and radial pulse absent: reduce flexion to < 45 and observe for 5 minutes
- Median; Anterior interosseous; radial or ulnar: generally neurapraxia
 - Complete return of function is usual
 - Indication for exploration- nerve dysfunction after intervention



Elbow stiffness and Myositis Ossificans

- Reduced flexion-
 1. Posterior tilt
 2. Medial rotation of distal fragment with protruding metaphyseal spike



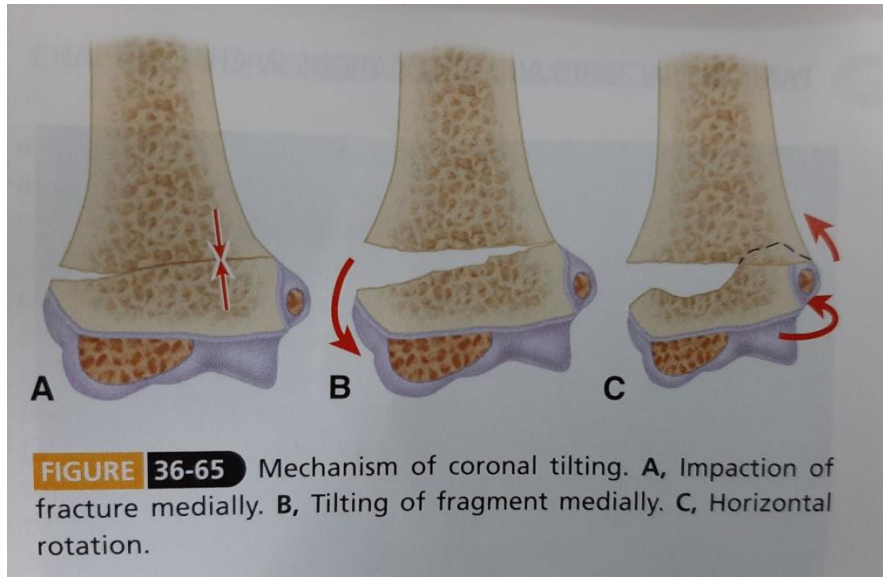
THANK YOU

Neuro-vascular issues

- Brachial artery injury:
normal perfusion, no
pulses –no need to
panic
- Pulseless, cold, pale
hand- Compartment
syndrome

Cubitus Varus

- Mechanism



- Posterior displacement/tilt causes minimal deformity
- Horizontal rotation with medial impaction encourages lateral opening and development of cubitus varus

Unstable #: Medial comminution; distal extension of fracture





Neuro-vascular issues

