

Fracture dislocation of the elbow

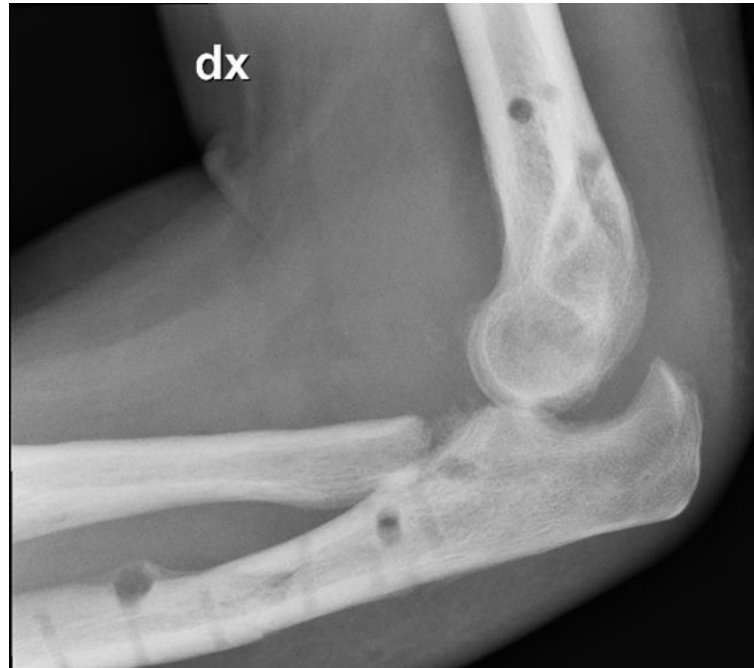


Johan Scheer

Linköping University hospital Sweden

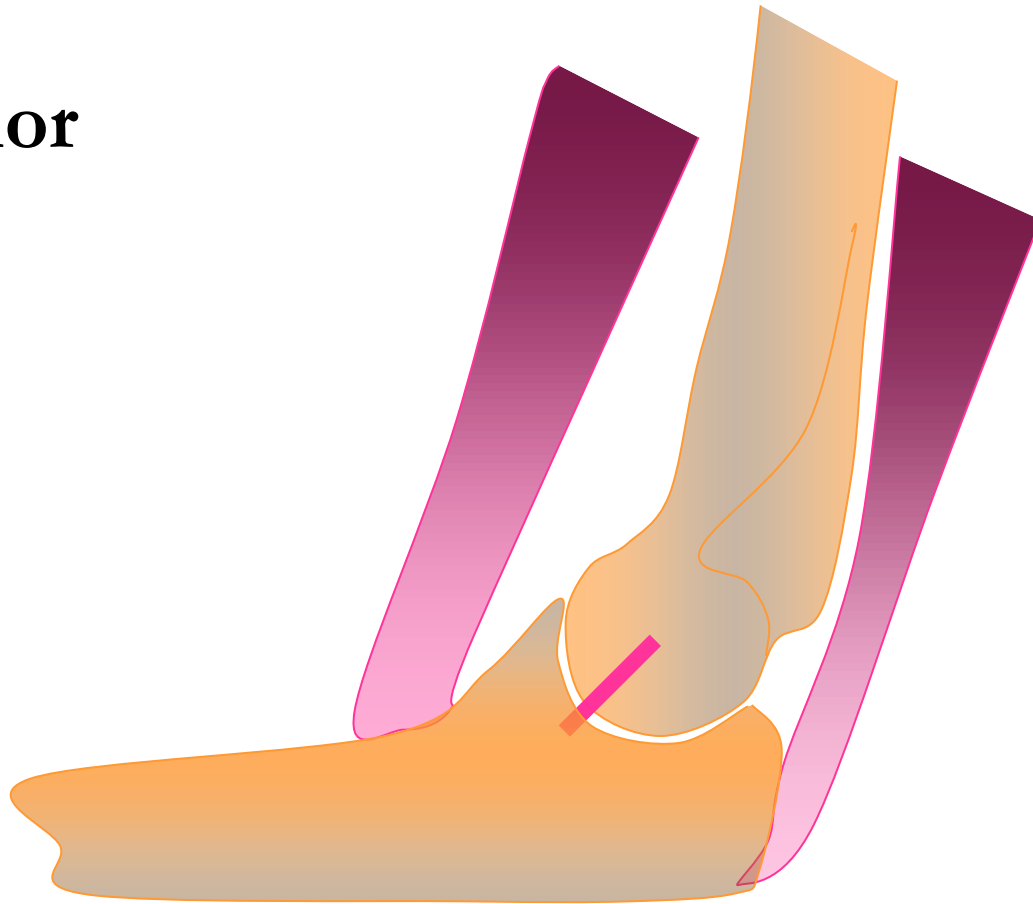
Take home

- Injuries to both bony and ligamentous structures need to be recognised and addressed
- The vast majority of cases (all) require surgery



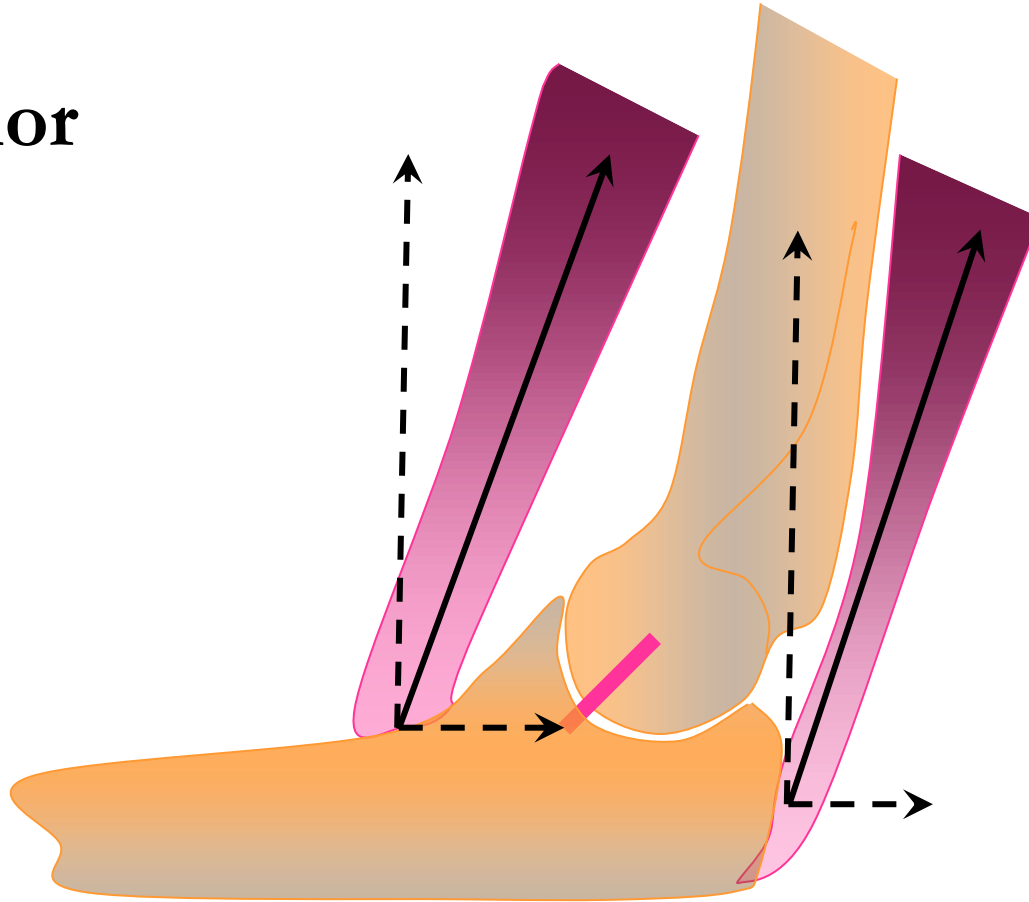
Displacing forces

1. **Posterior**
2. Cranial

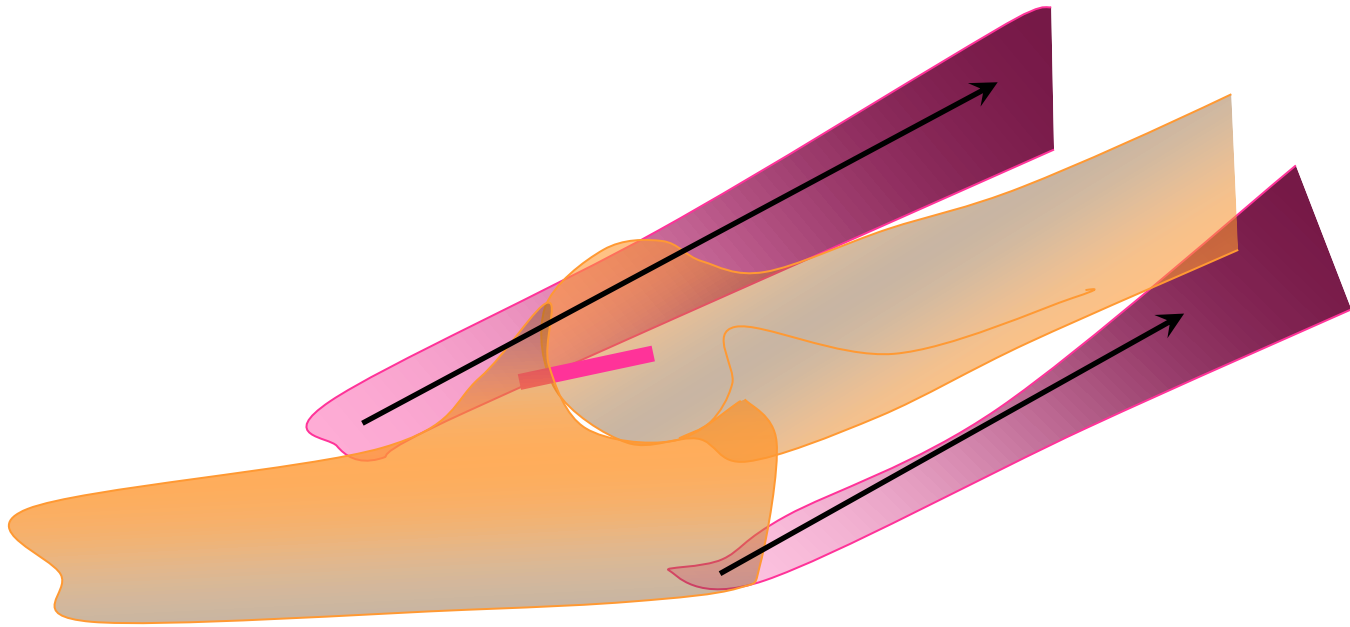


Displacing forces

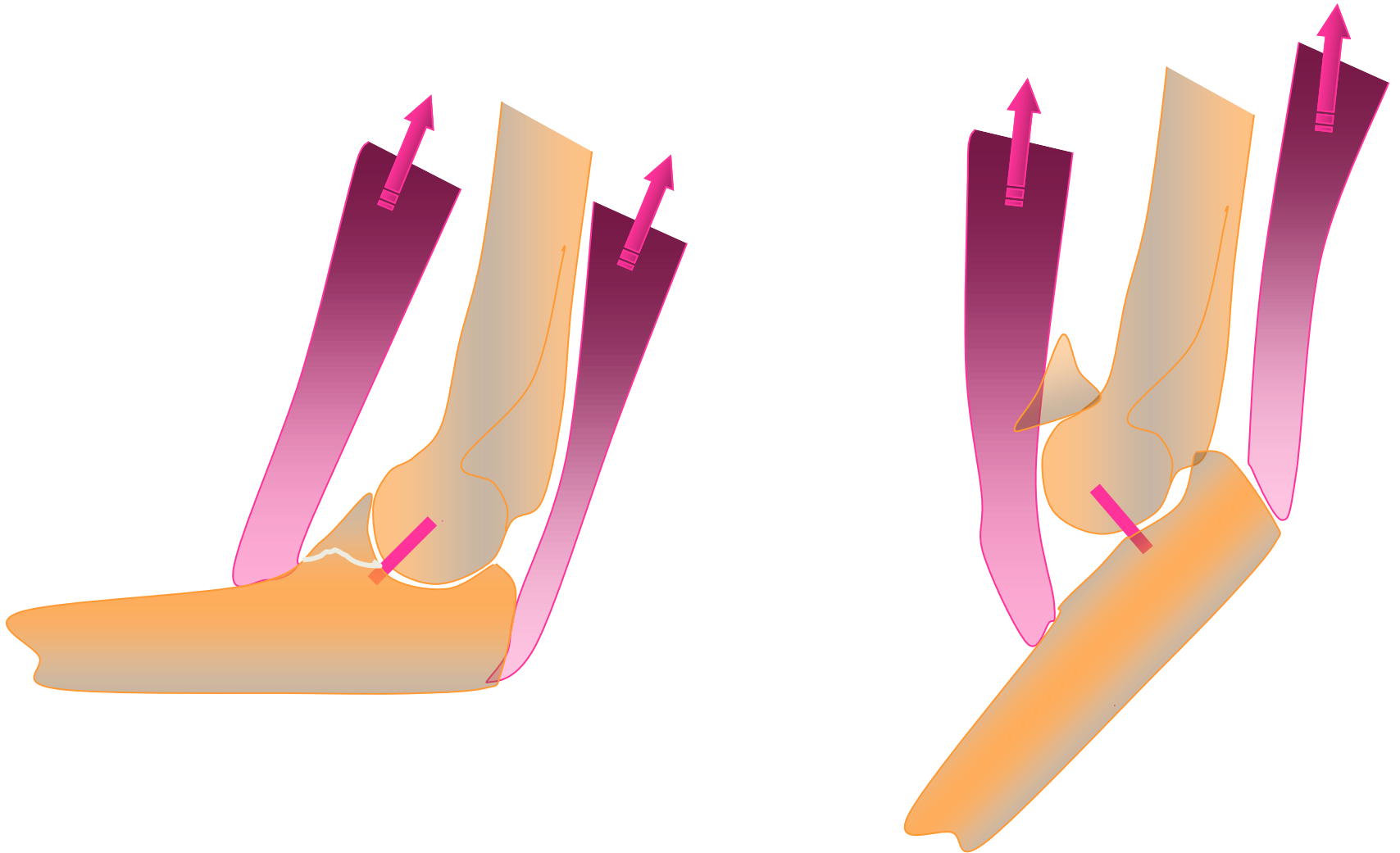
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2. Cranial



Most unstable in extension

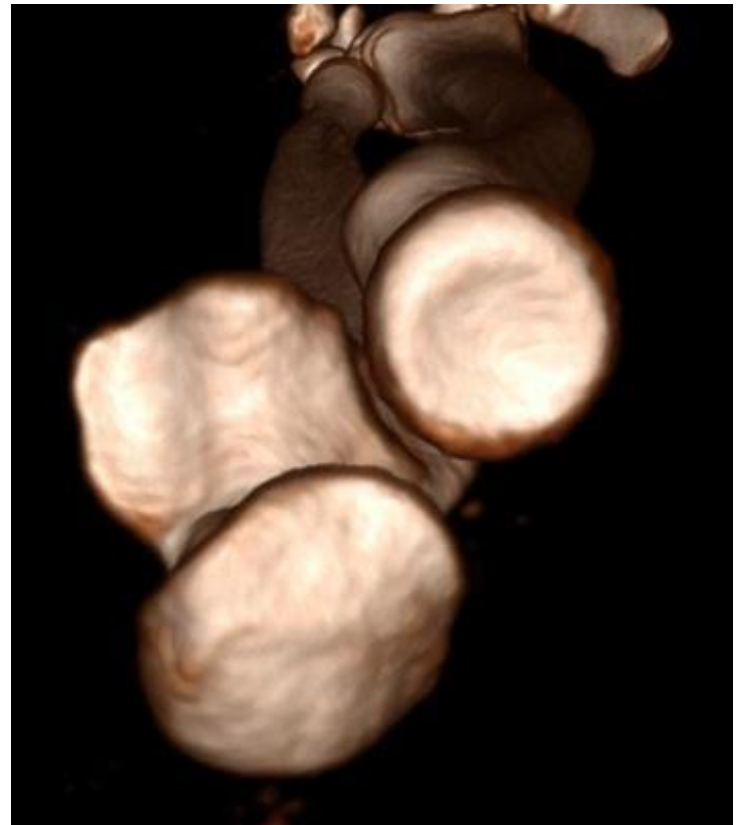


Axial stability – severe anterior wall injury



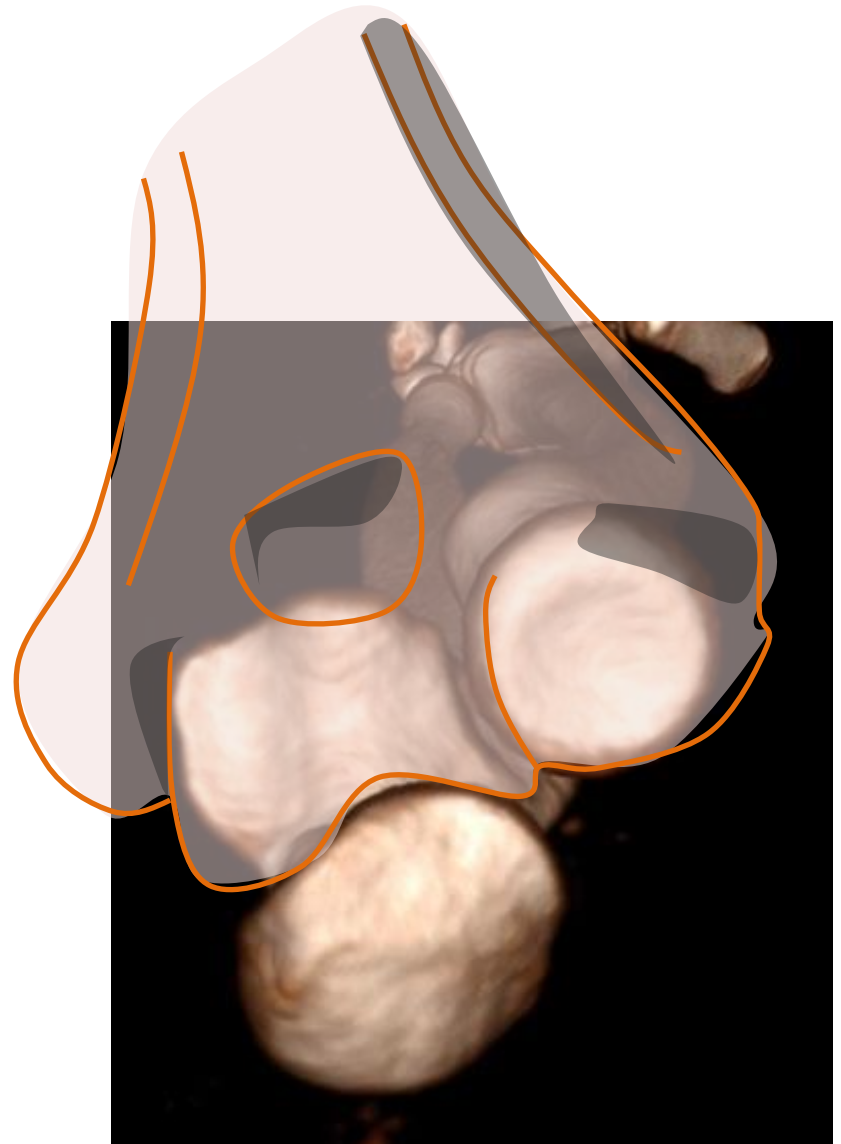
Anterior wall

1. **Coronoid process** –
single most important
stabiliser of the elbow
2. Radial head

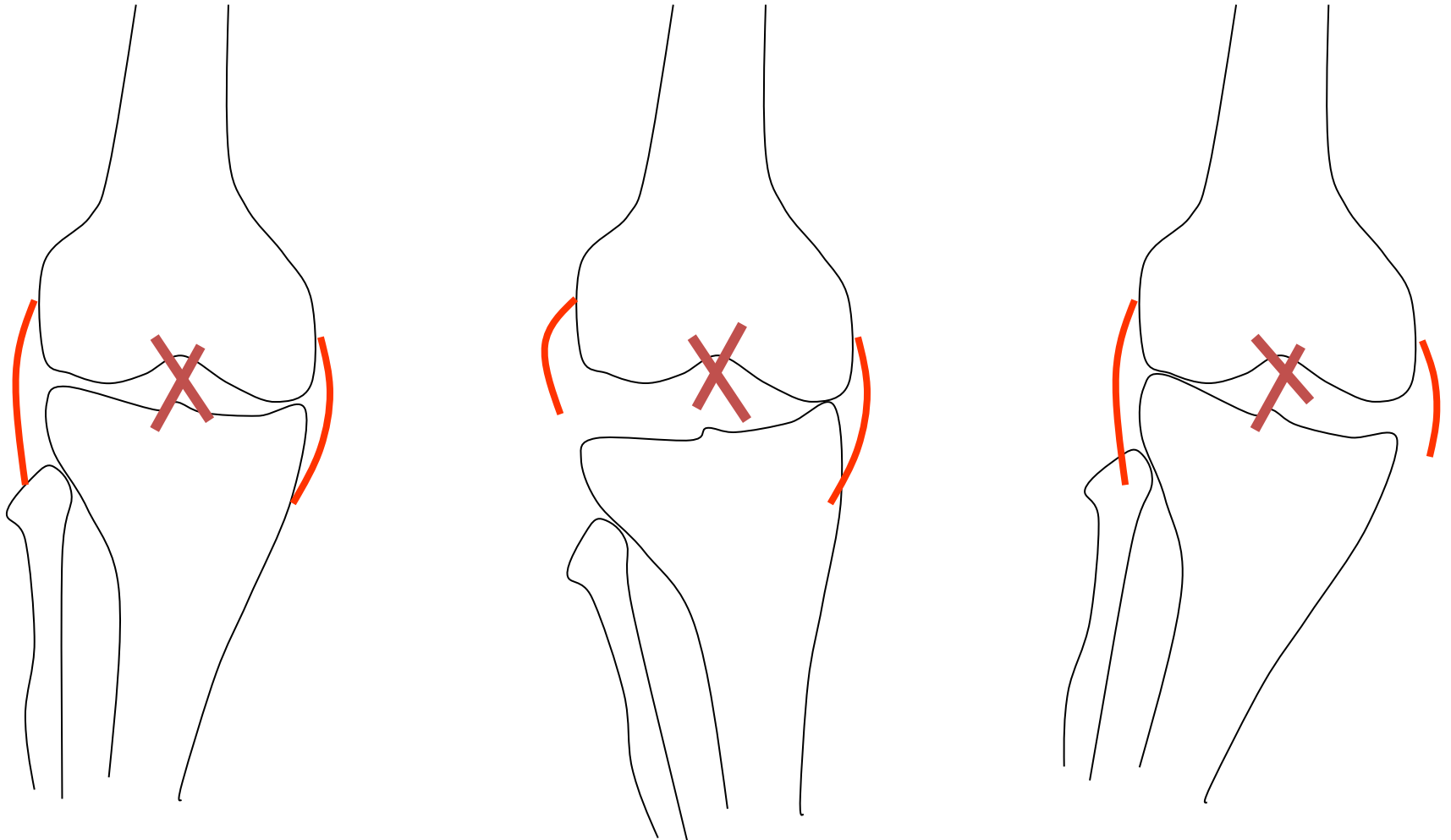


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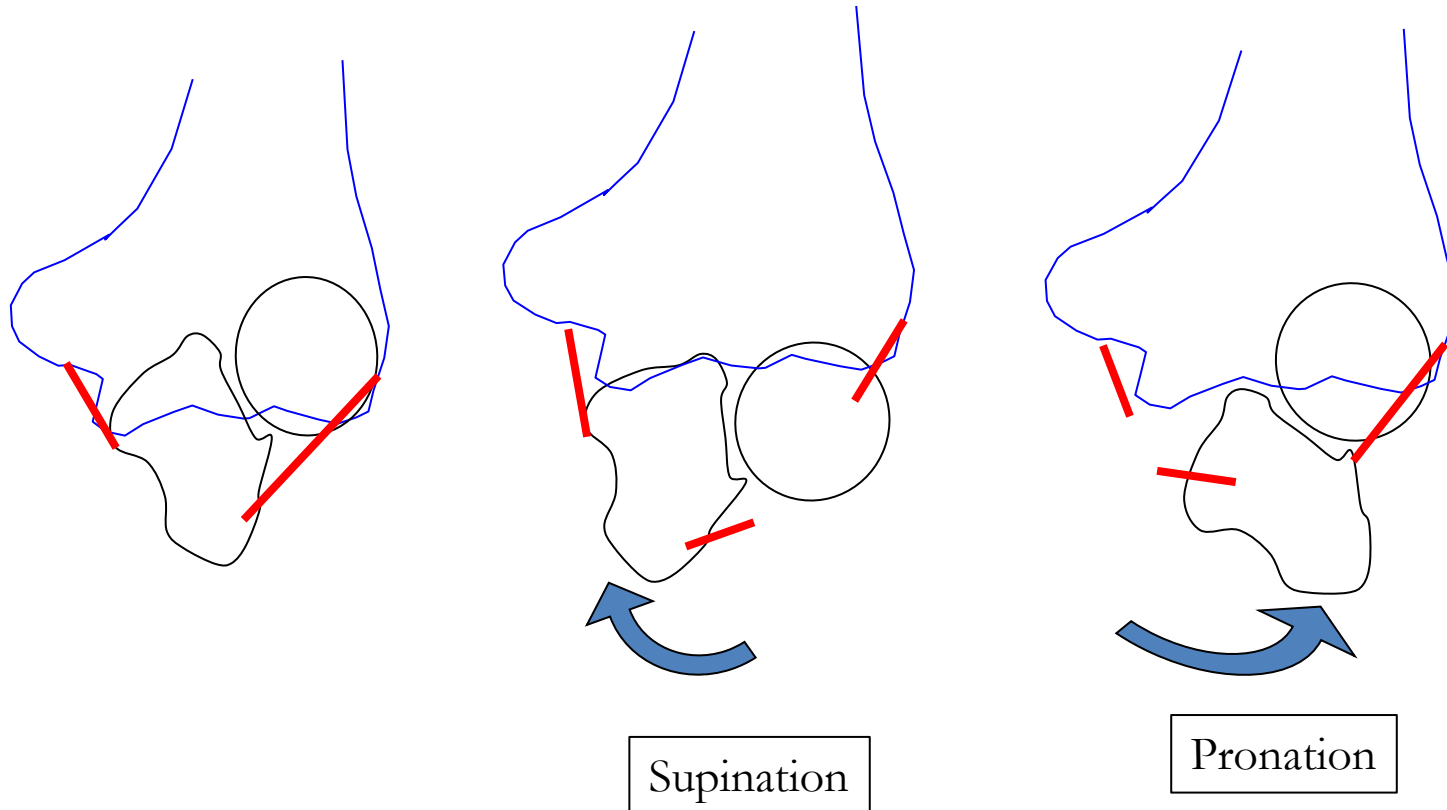


The knee – stabilised by ligaments



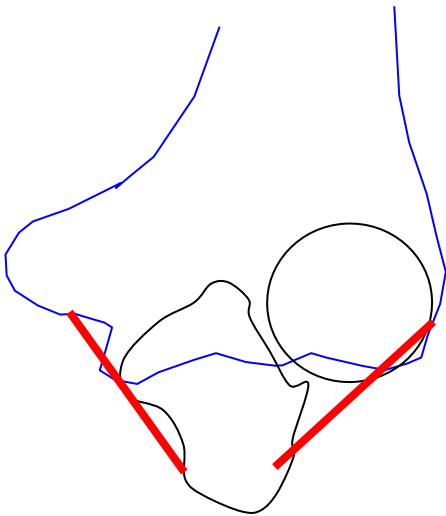
Collateral ligaments – rotational stability

- Keep the (whole) forearm from rotating out of the trochlea



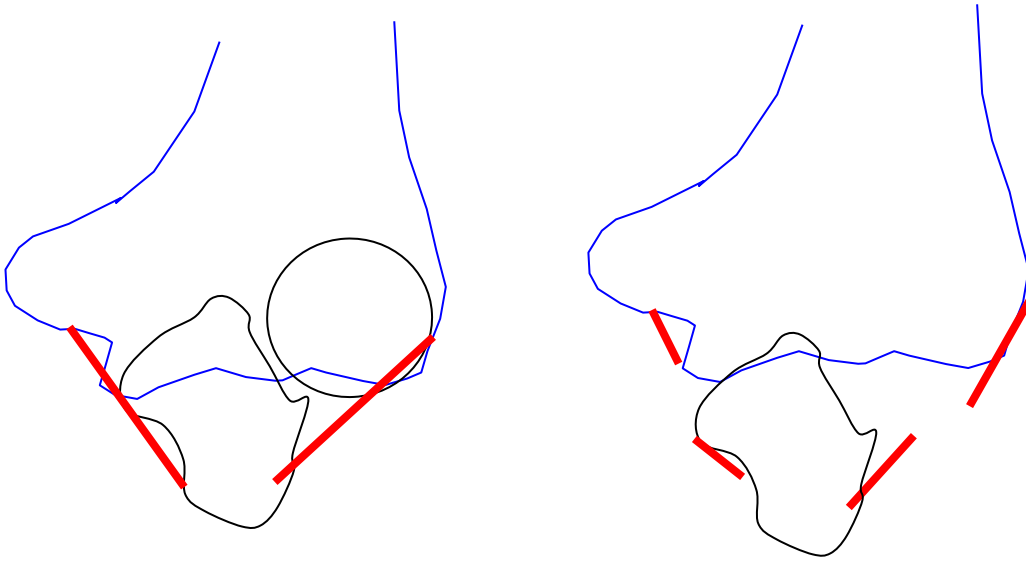
Combination of injuries

- Loss of both collateral ligaments and anterior wall result in severe axial instability



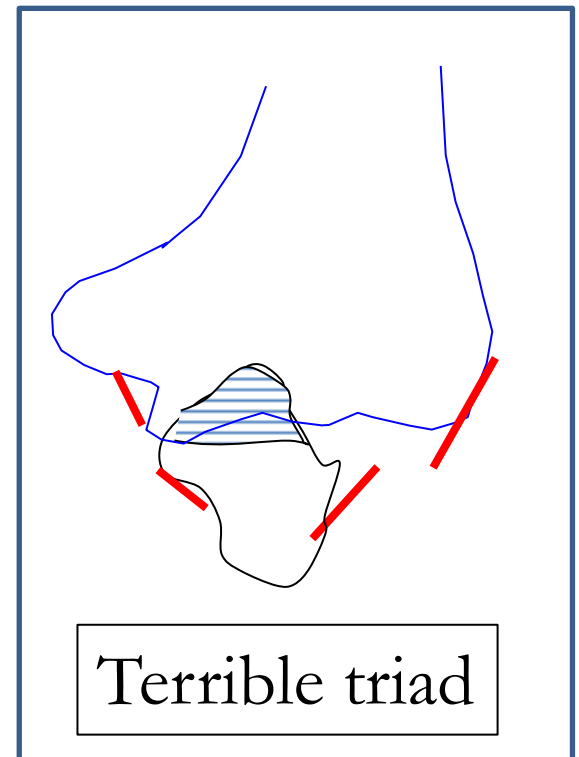
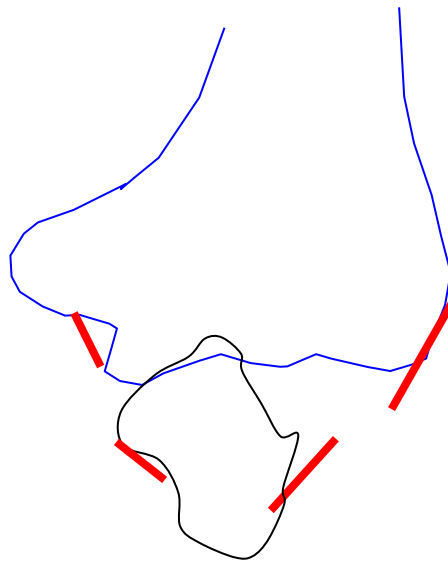
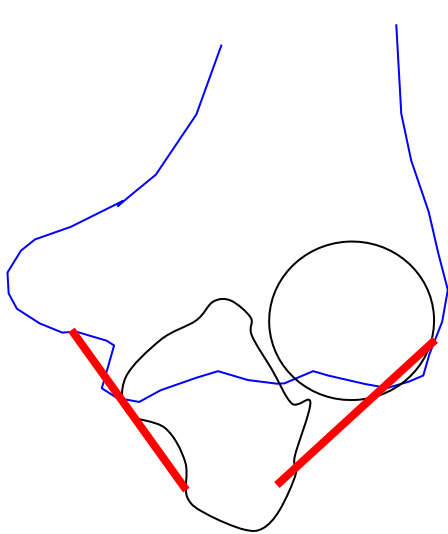
Combination of injuries

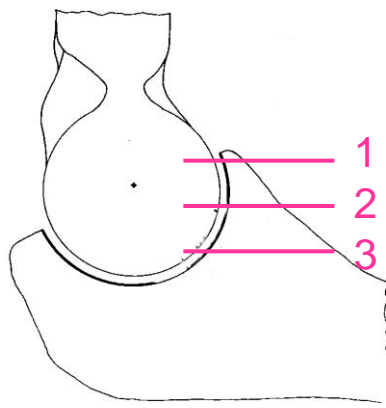
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Combination of injuries

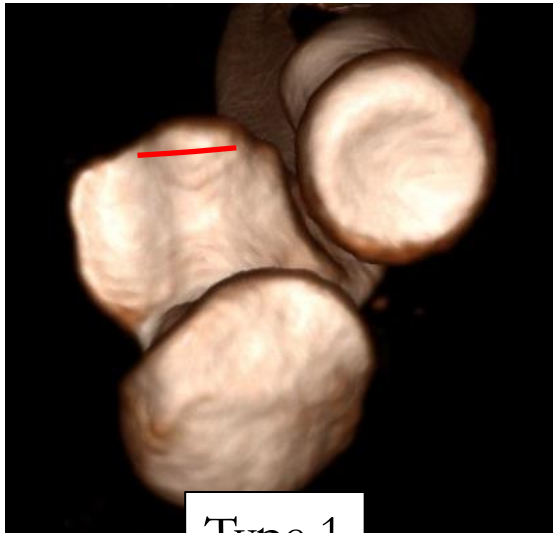
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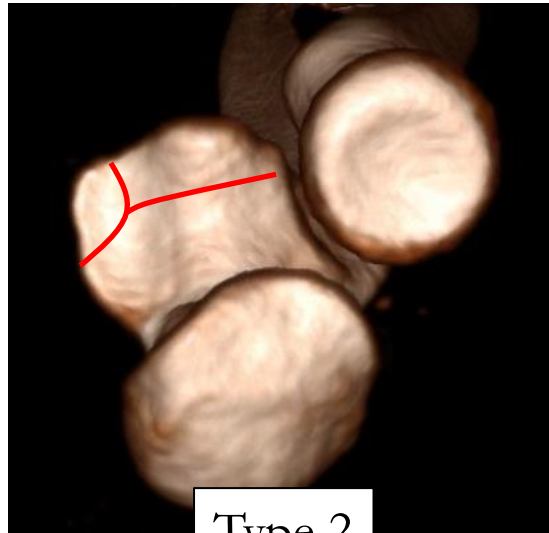


Fractures of the coronoid process

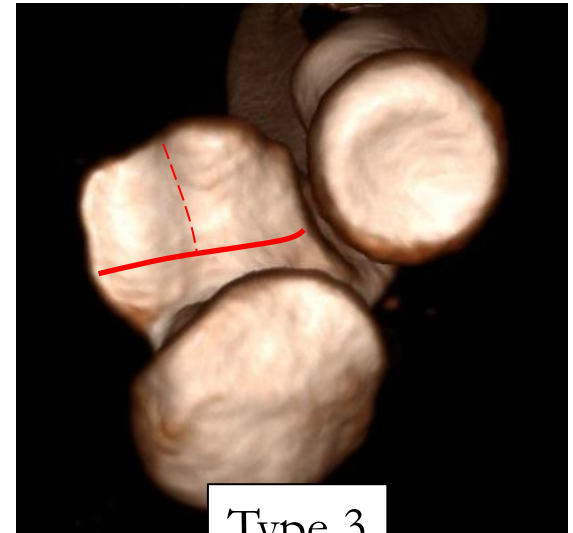
1. Type 1: Tip
2. Type 2: Intermediate
 - Different patterns
 - Anteromedial process
3. Type 3: Base



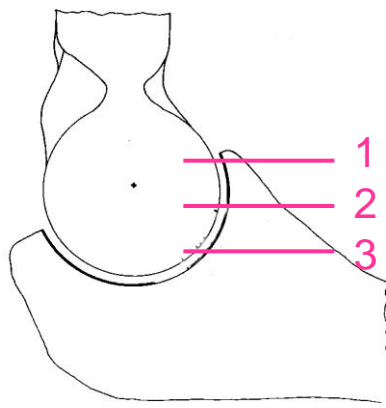
Type 1



Type 2

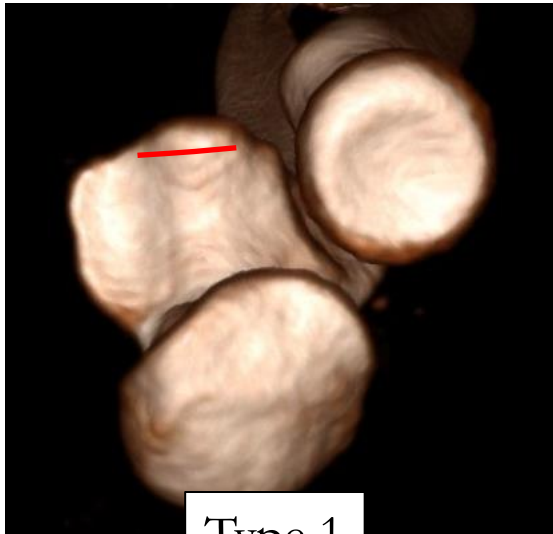


Type 3



Fractures of the coronoid process

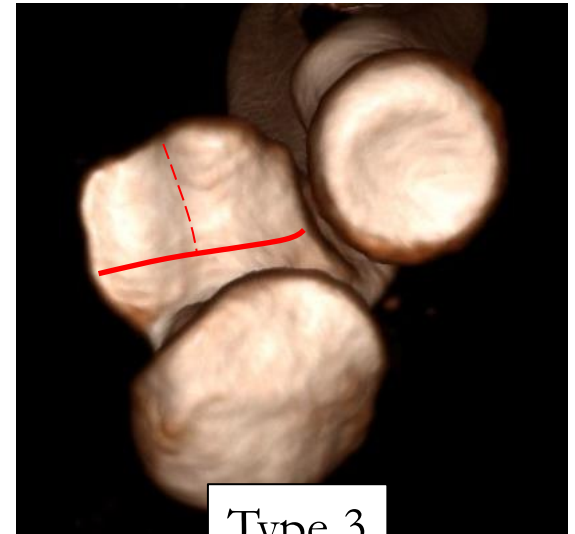
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Type 1



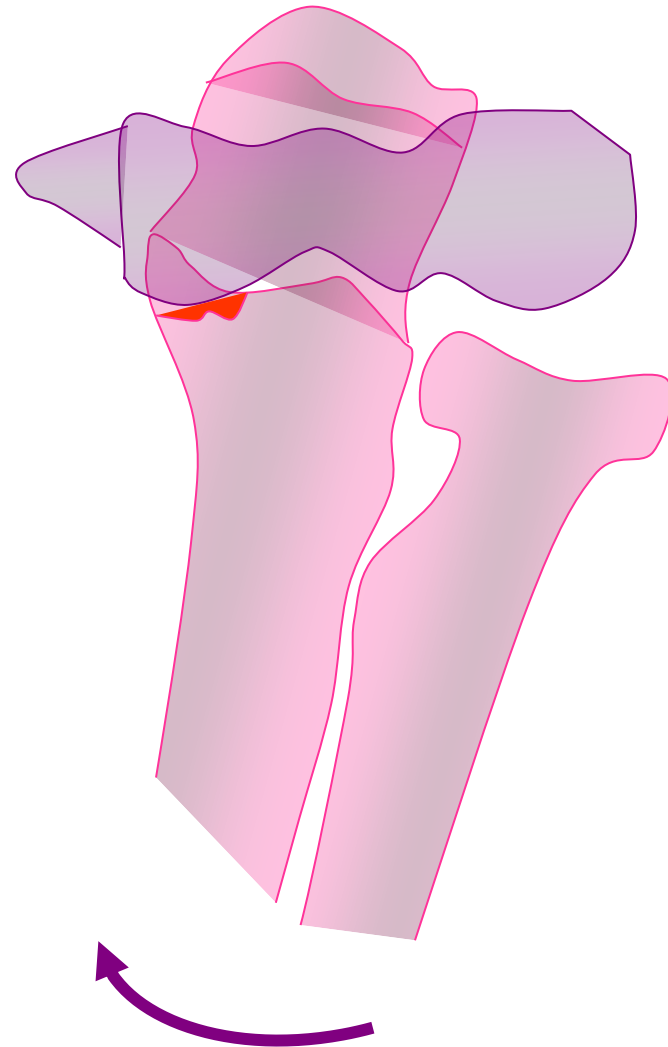
Type 2



Type 3

Fracture of the anteriomedial process (sublime tubercle)

- Varus instability
- Medial collateral ligament insertion



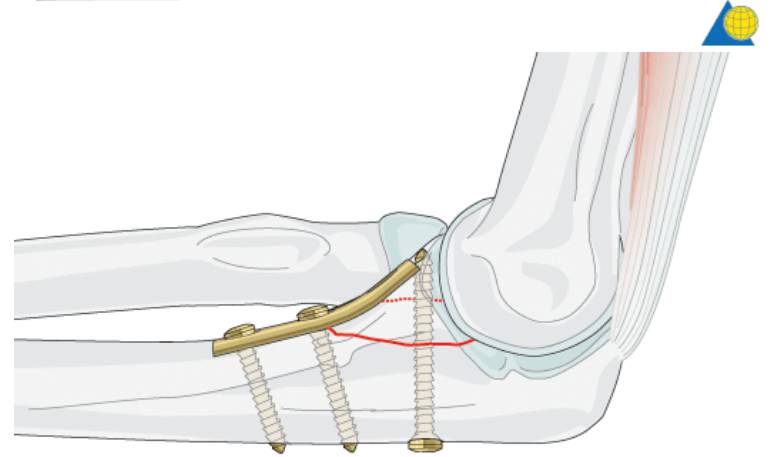
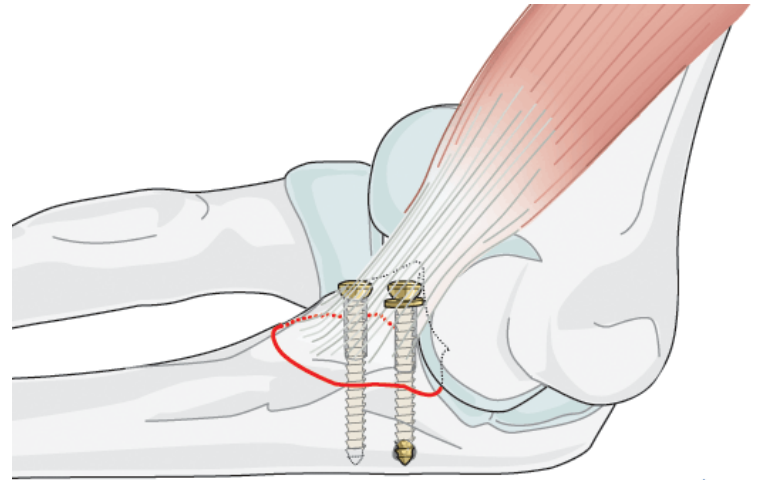
Terrible triad

- Treatment workup:
 1. Reduce and scan (CT)
 2. Restore coronoid
 3. Radial head – fix or replace
 4. Repair collateral ligaments
 5. Apply (hinged) x-fix if still unstable



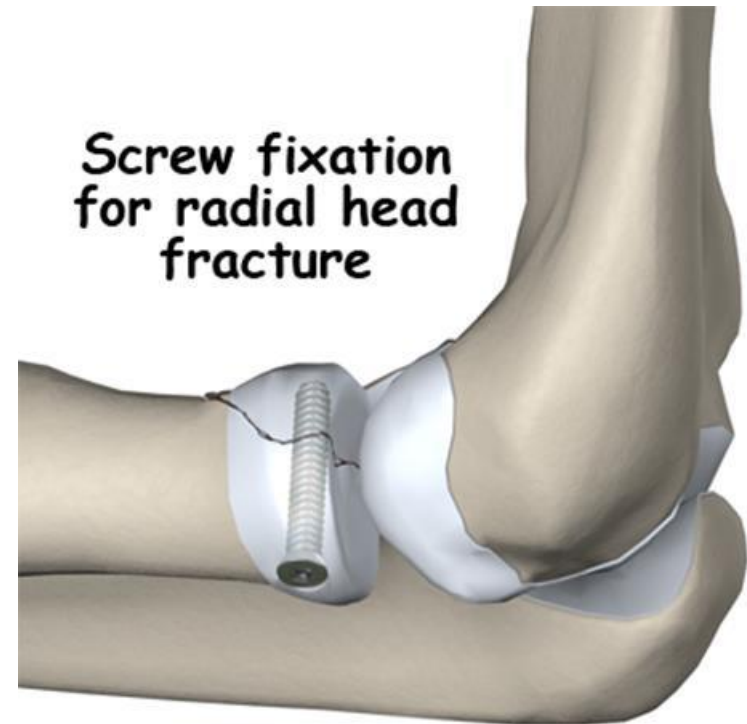
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Management of terrible triad

- Treatment workup:
 1. Reduce and scan (CT)
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Radial head fractures

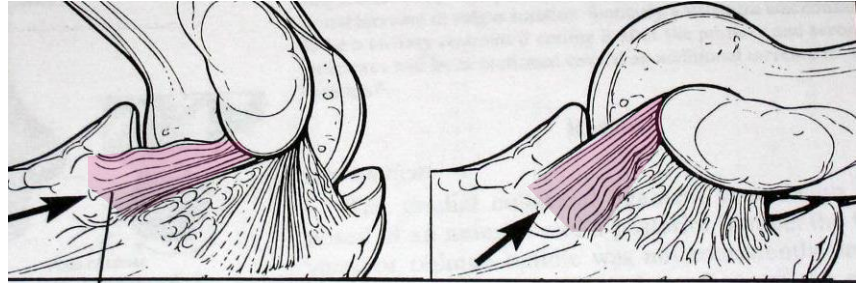
- If more than two fragments –
ORIF is futile
 - Replace (or
excise)



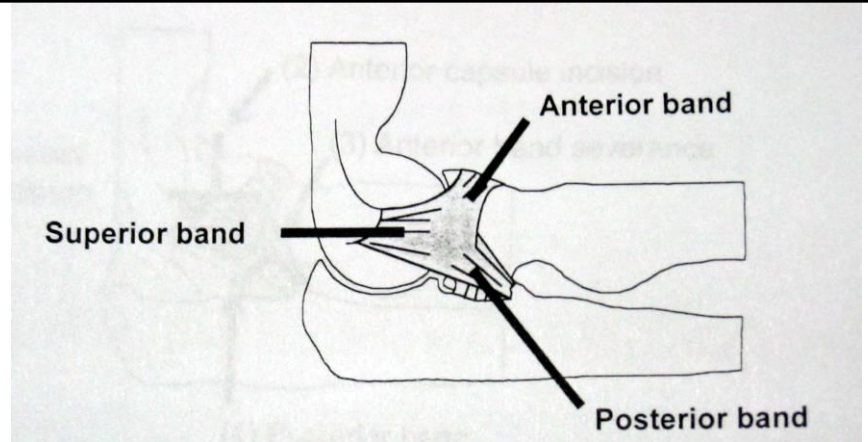
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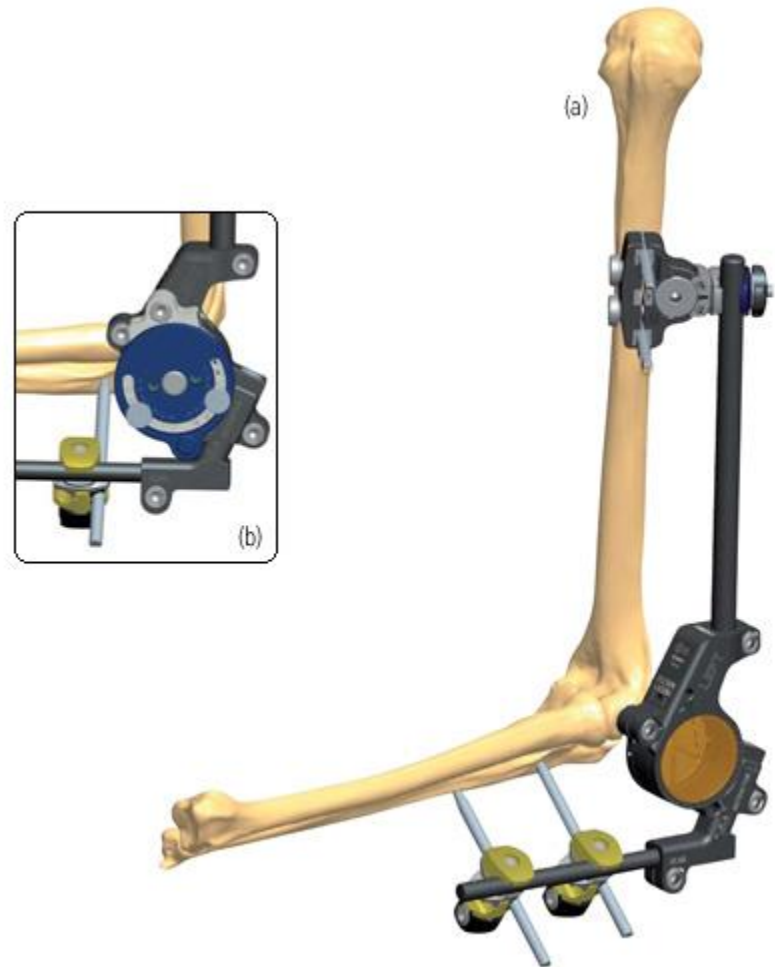
Medial collateral ligament



Lateral collateral ligament

Terrible triad

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AP – instability (transolecranon fracture pattern)

- Fracture pattern of the coronoid variable
- With or without radial head fracture



Simple pattern

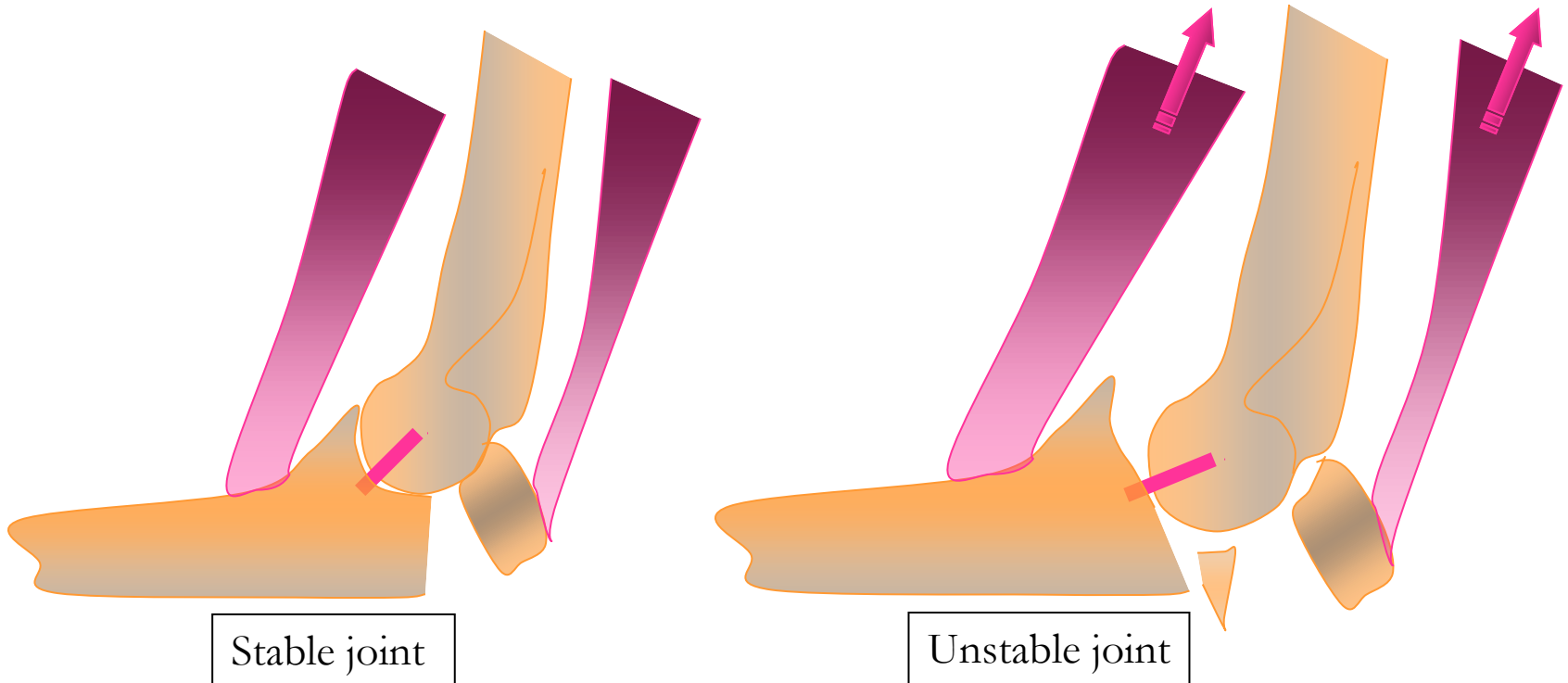


Complex pattern

AP instability

(transolecranon fracture patterns)

- Proximal ulna fracture distal to the "equator"



AP instability – key points

- They can never be treated with tension band wiring
- The **coronoid** is the key – it must be **restored and stable**



Case

- 25 y o man
- Motocross accident
- Closed injury right elbow
- NV intact

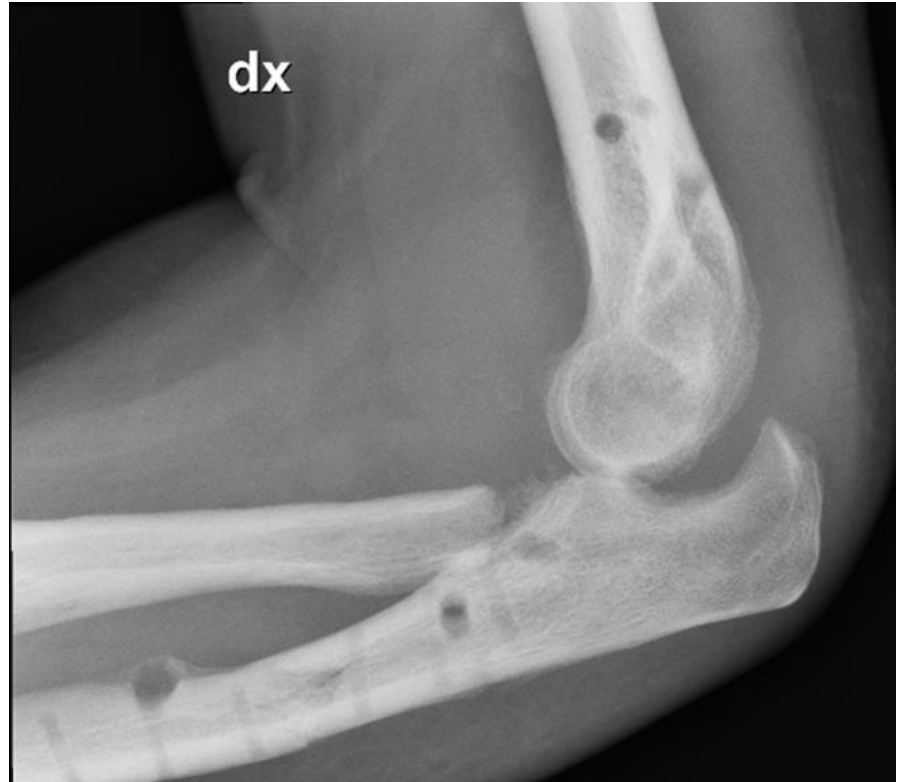




2 months later



- Another 3 mo later
- Multiple attempts of closed reduction and x-fix



Summary

- Instability of the elbow can be:
 - Axial
 - Anteroposterior
- Both bony and ligamentous structures contribute to stability and must be addressed in complex injuries