

# Fracture dislocation of the elbow

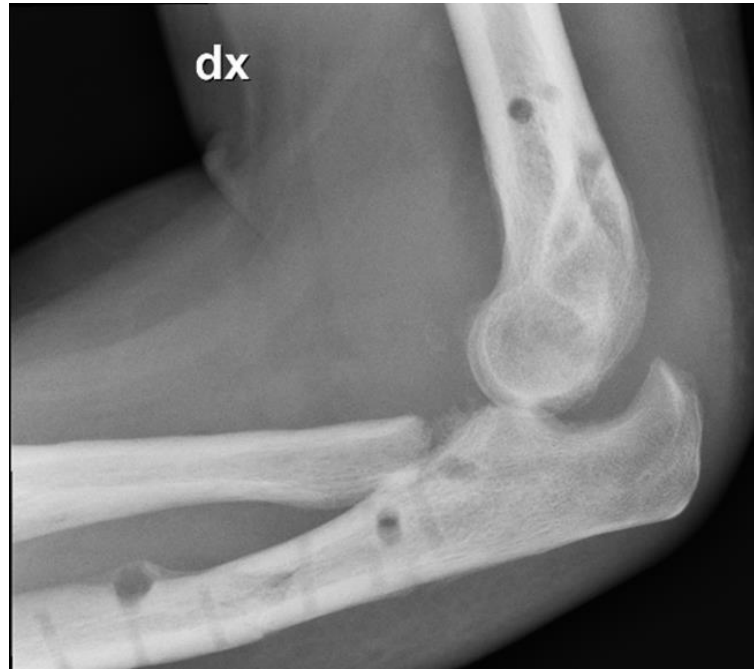


Johan Scheer

Linköping University hospital Sweden

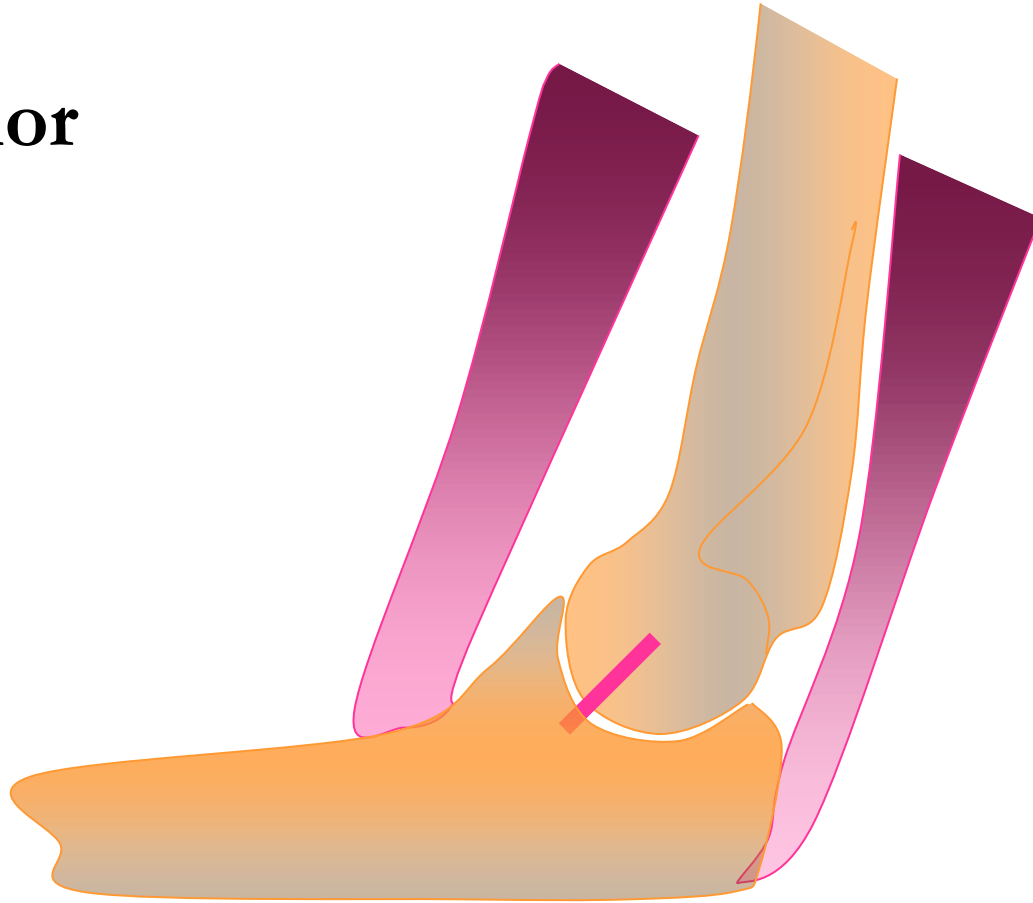
# Take home

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



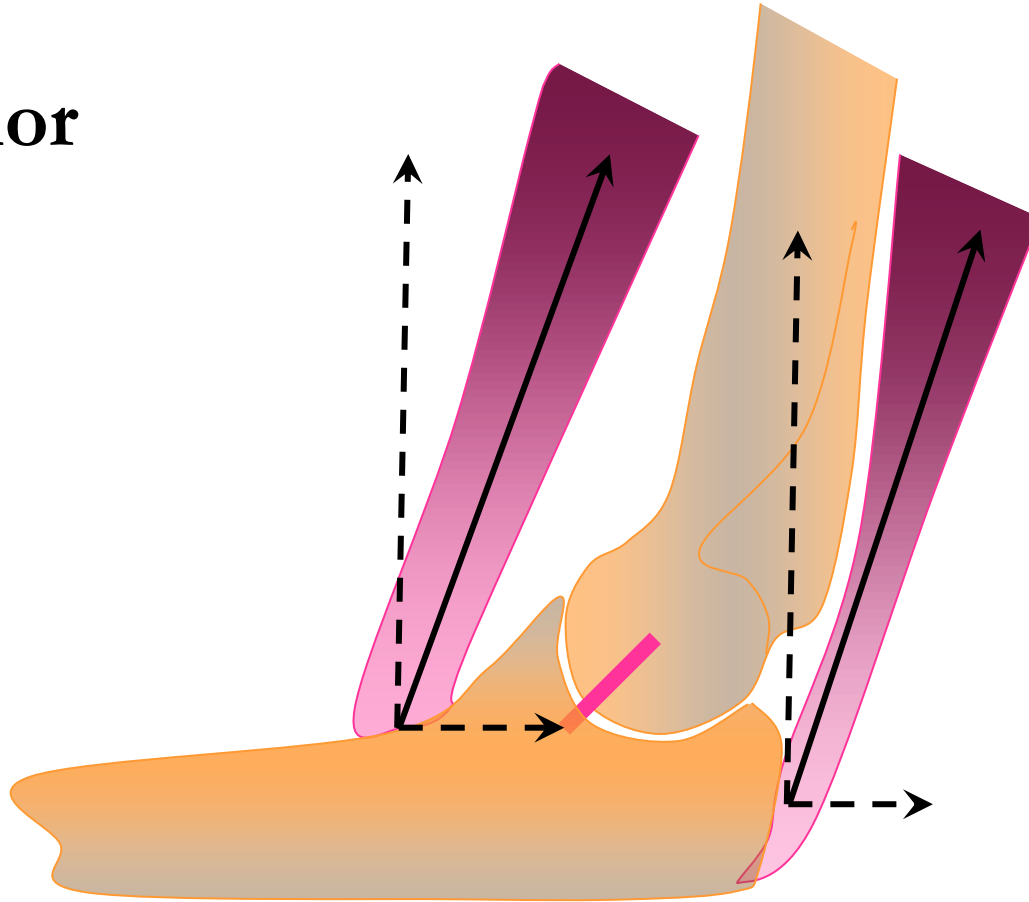
# Displacing forces

1. **Posterior**
2. **Cranial**

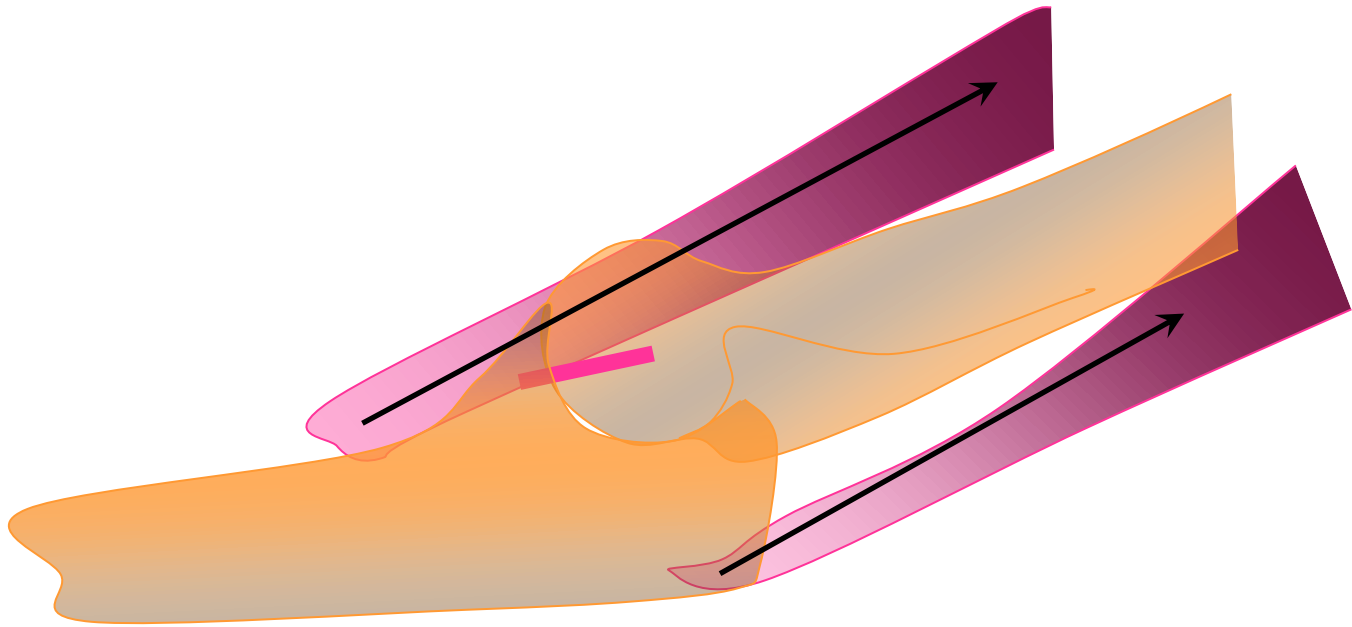


# Displacing forces

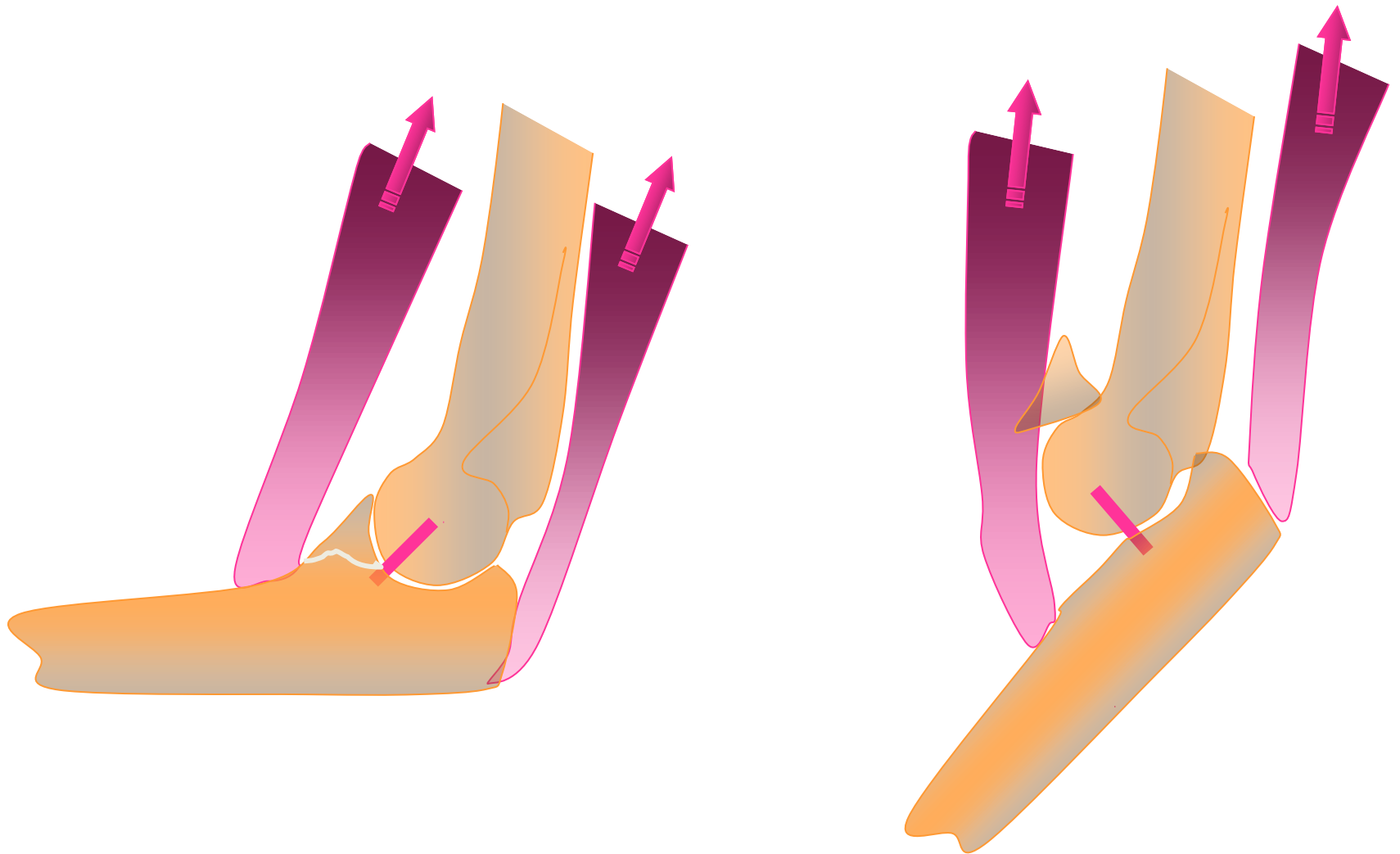
1. **Posterior**
2. **Cranial**



Most unstable in extension

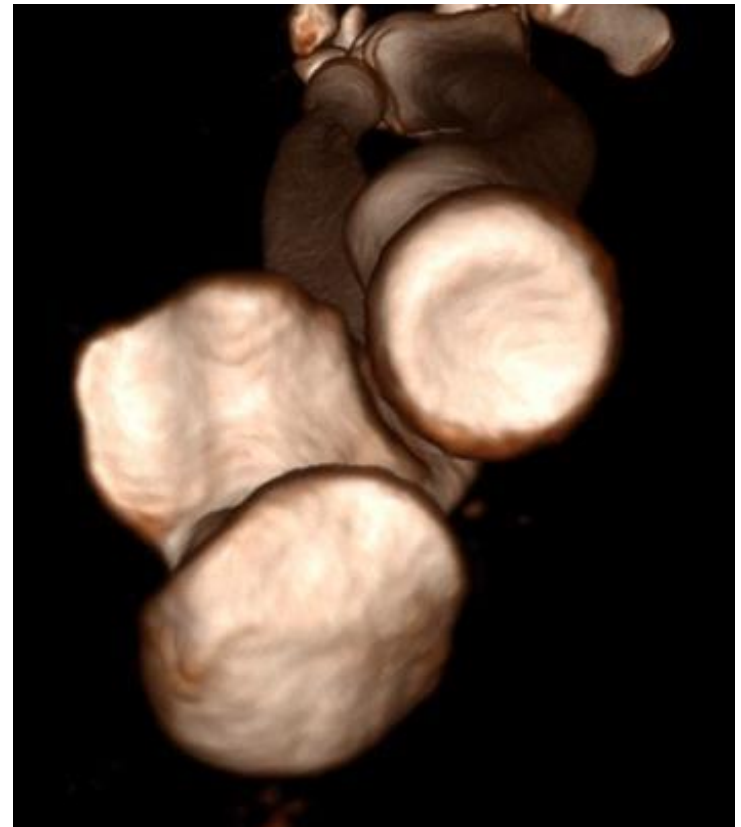


# Axial stability – severe anterior wall injury



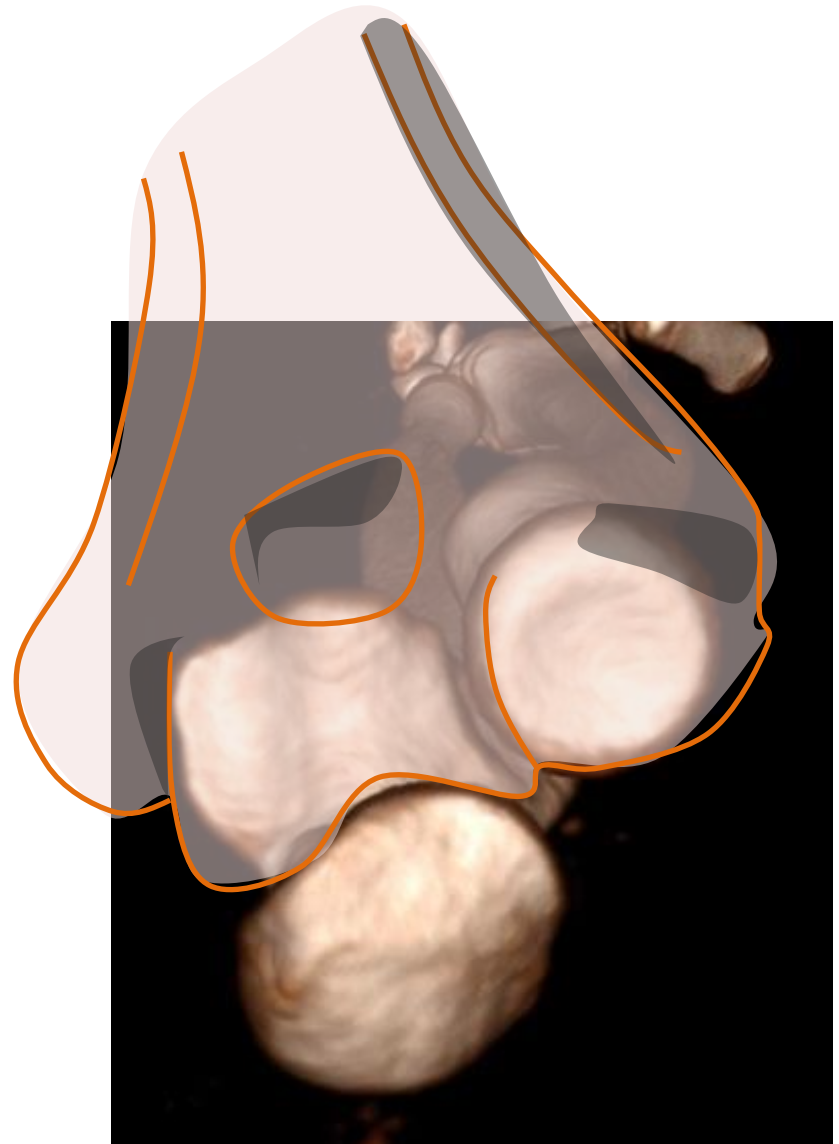
# Anterior wall

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



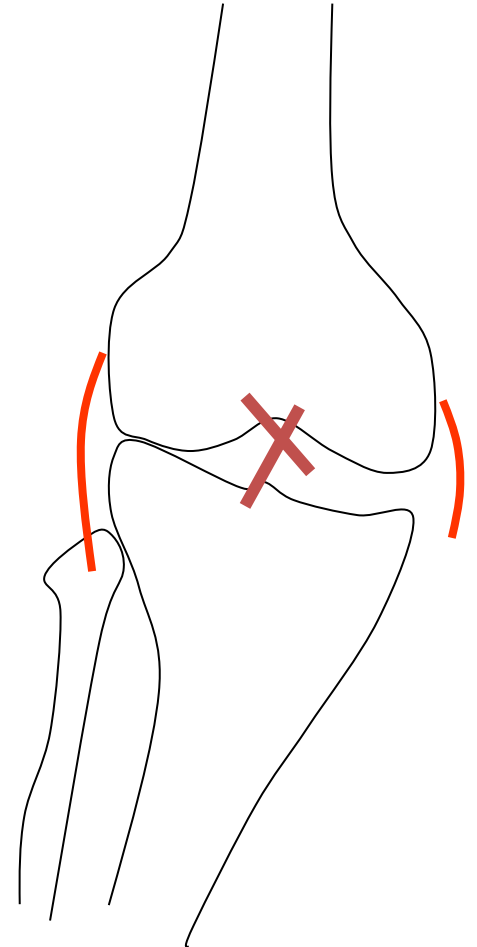
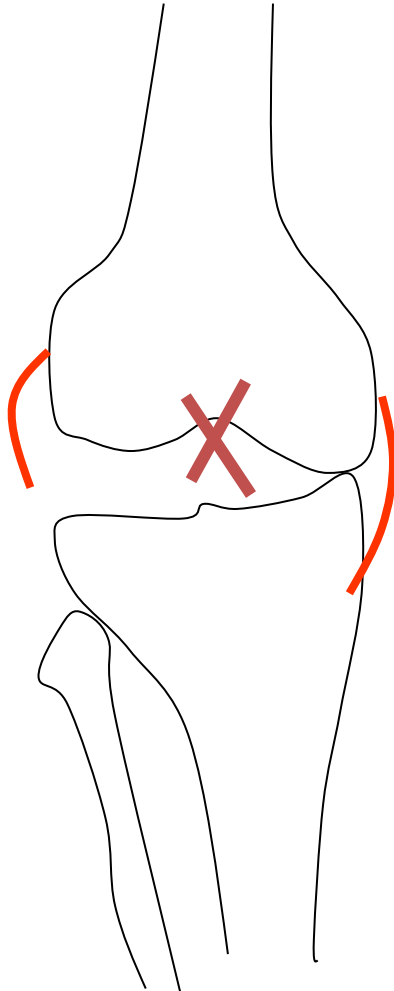
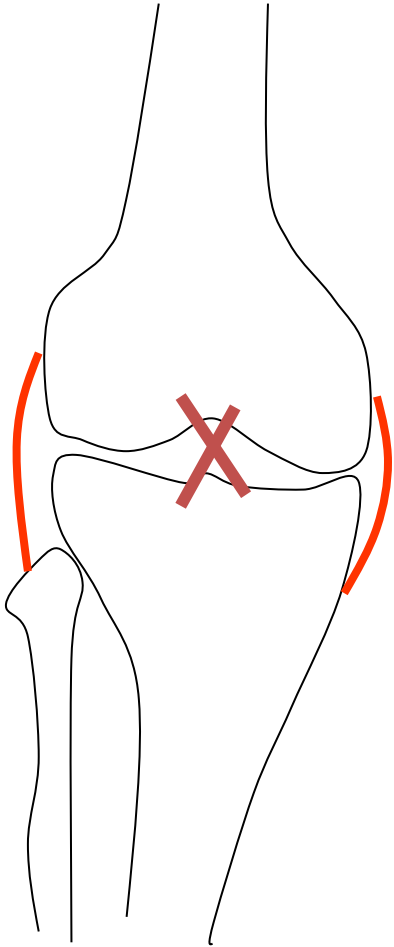
# Anterior wall

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



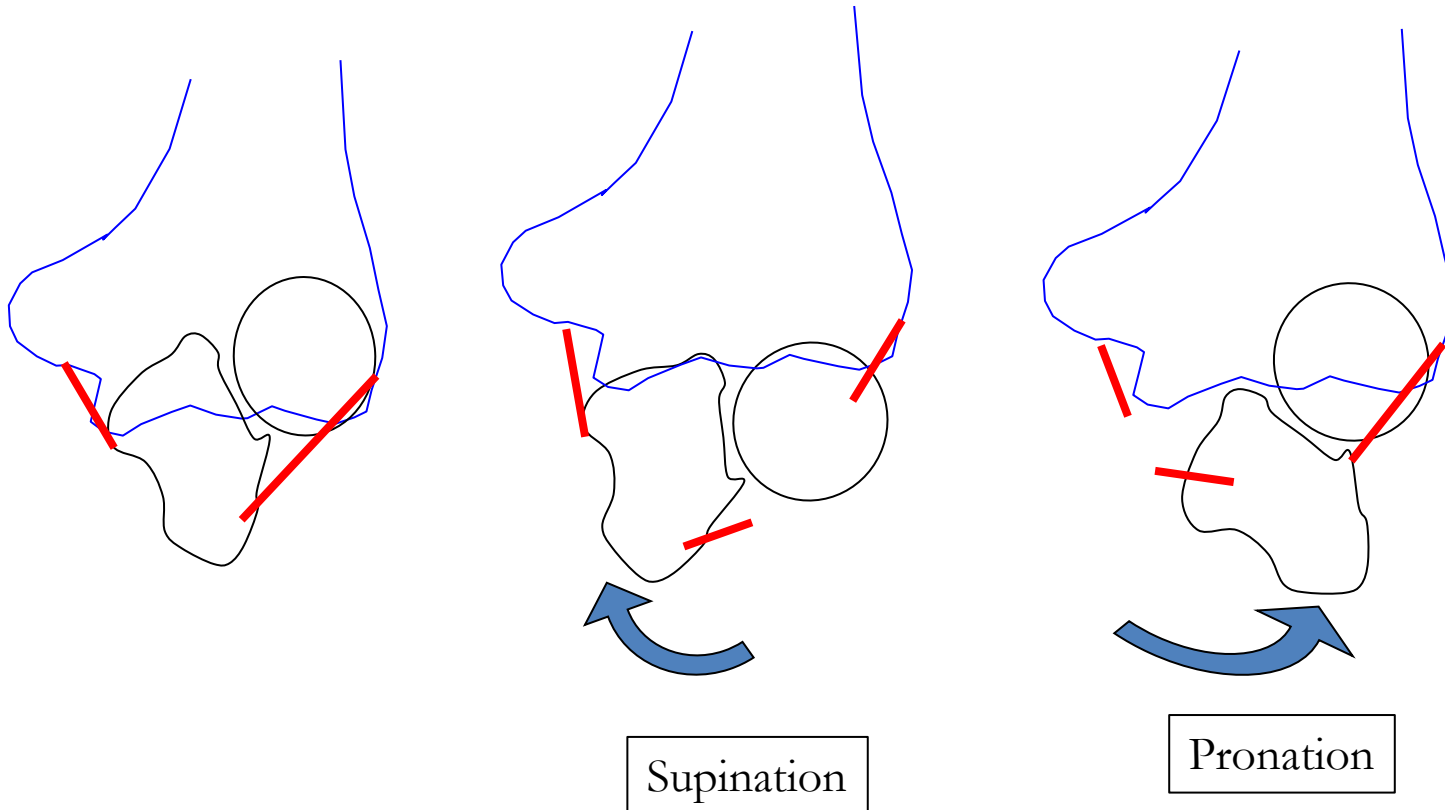


# The knee – stabilised by ligaments



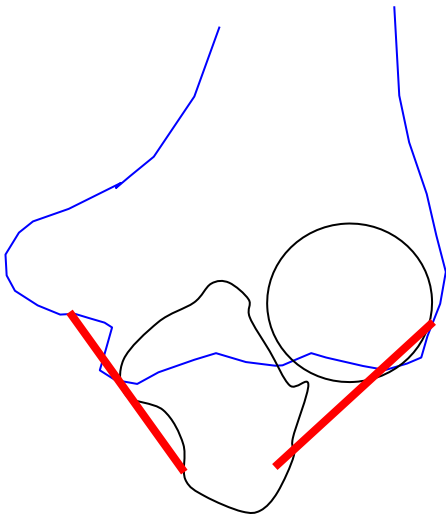
# Collateral ligaments – rotational stability

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



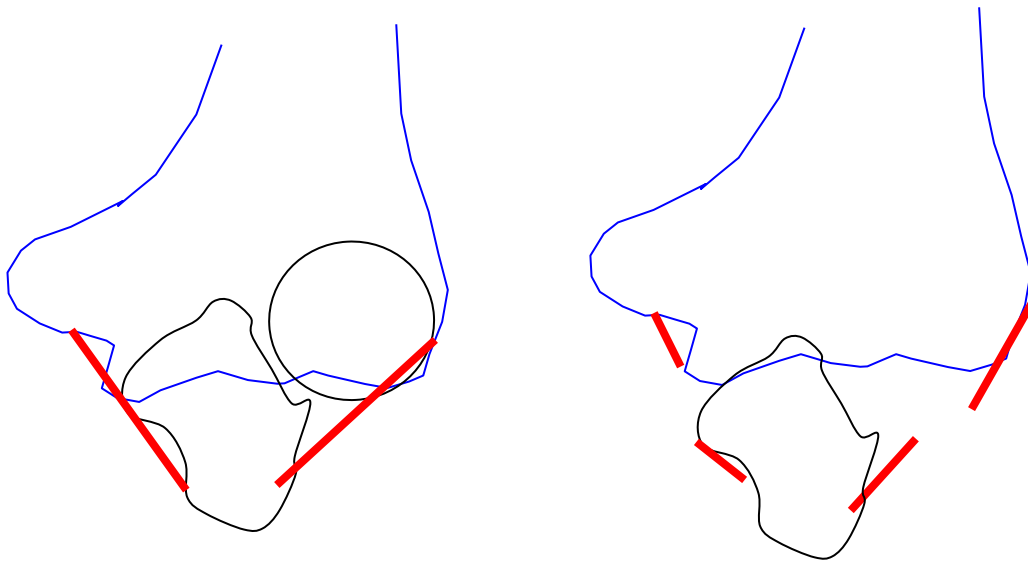
# Combination of injuries

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



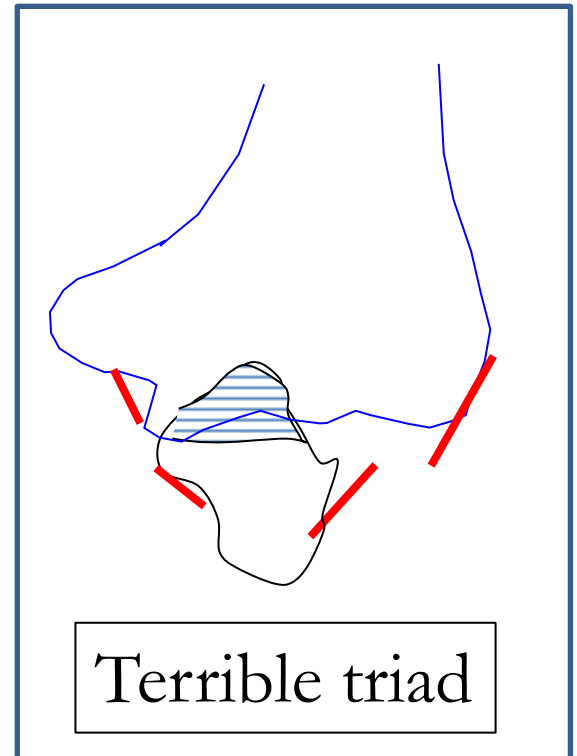
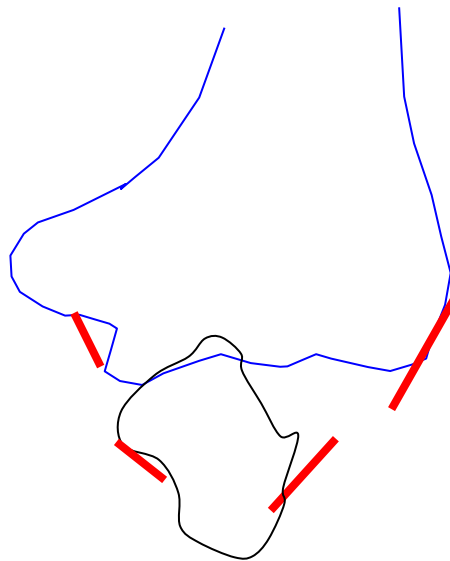
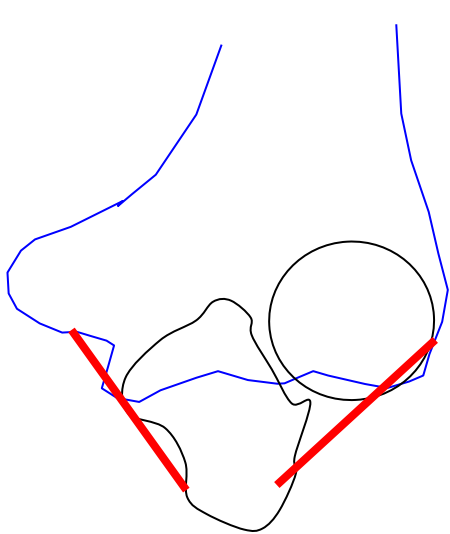
# Combination of injuries

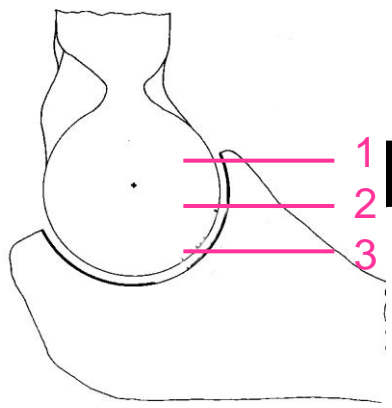
- Loss of both collateral ligaments and anterior wall result in severe axial instability



# Combination of injuries

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



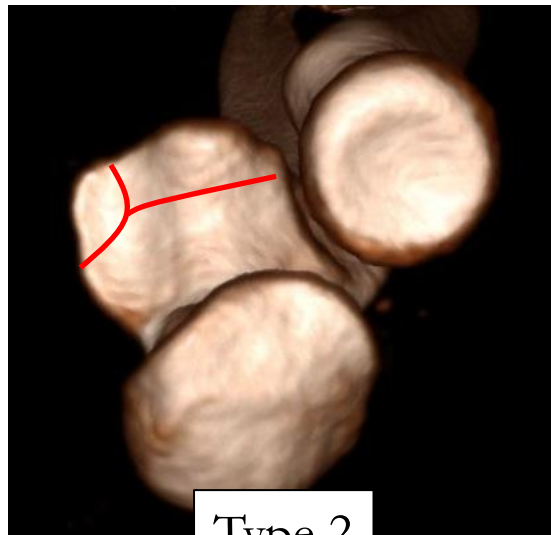


# Fractures of the coronoid process

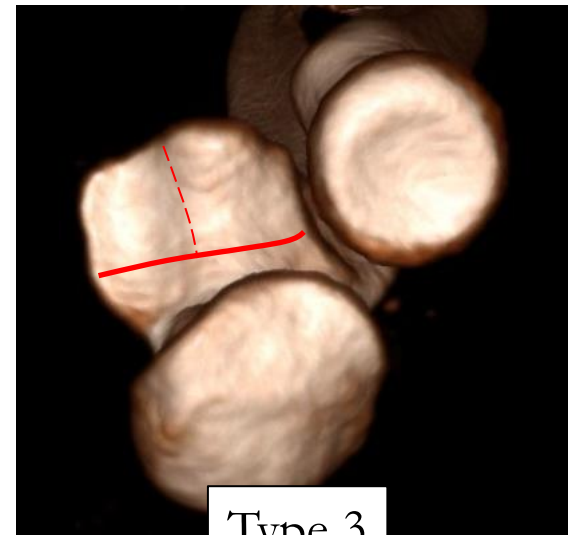
1. Type 1: Tip
2. Type 2: Intermediate
  - Different patterns
  - Anteromedial process
3. Type 3: Base



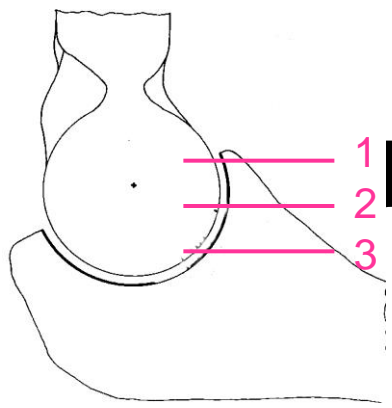
Type 1



Type 2

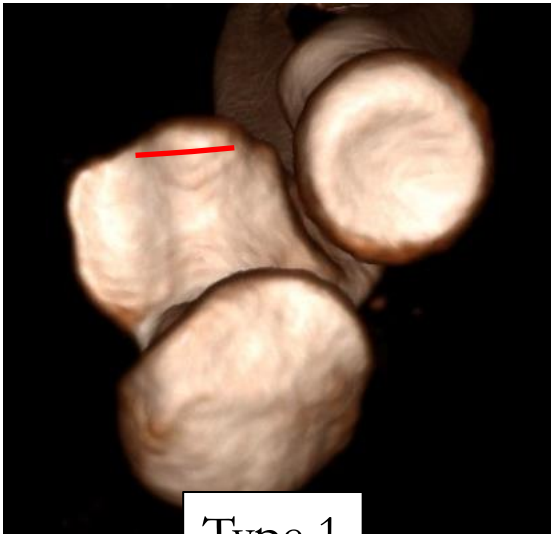


Type 3

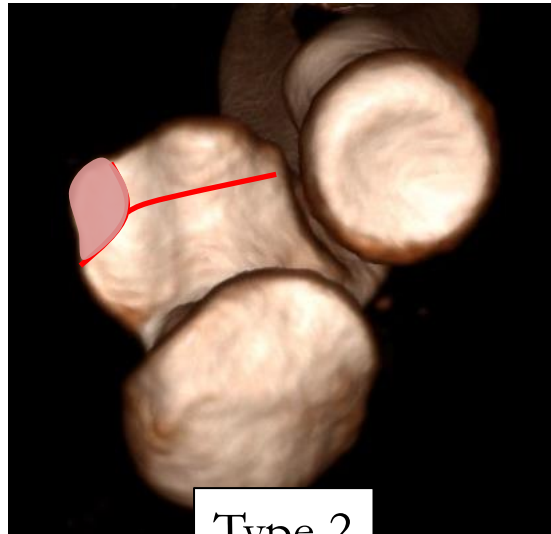


# Fractures of the coronoid process

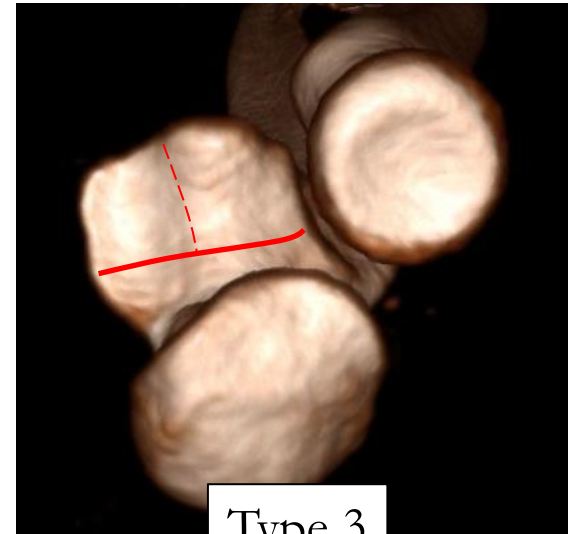
1. Type 1: Tip
2. Type 2: Intermediate
  - Different patterns
  - Anteromedial process
3. Type 3: Base



Type 1



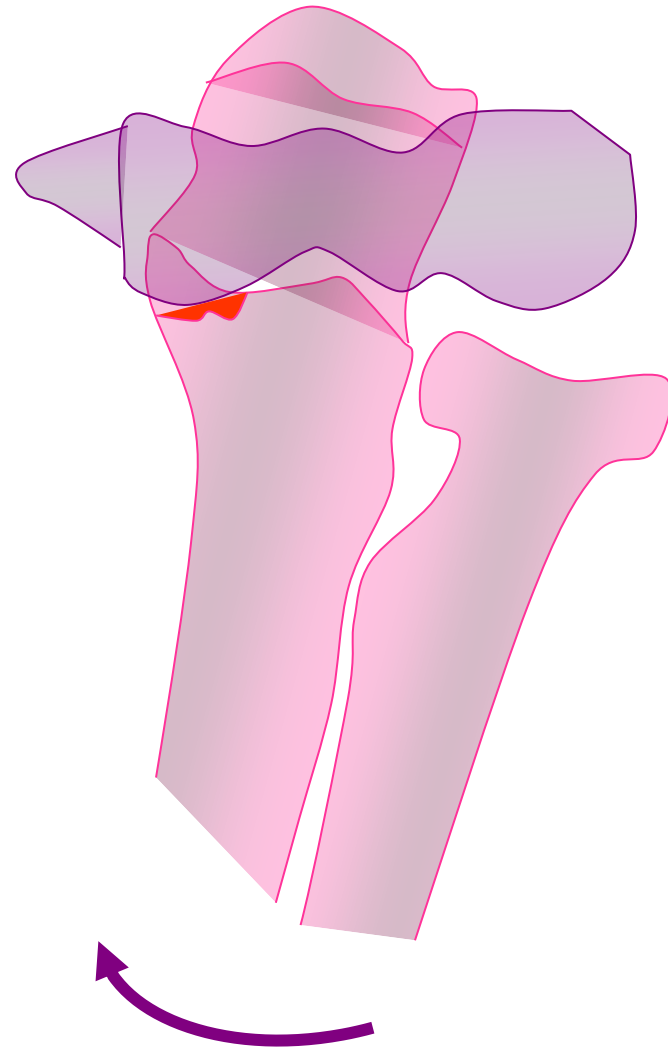
Type 2



Type 3

# Fracture of the anteriomedial process (sublime tubercle)

- Varus instability
- Medial collateral ligament insertion





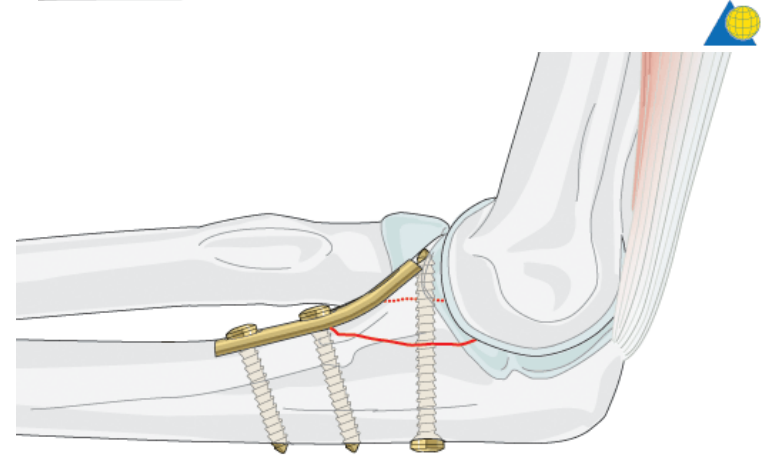
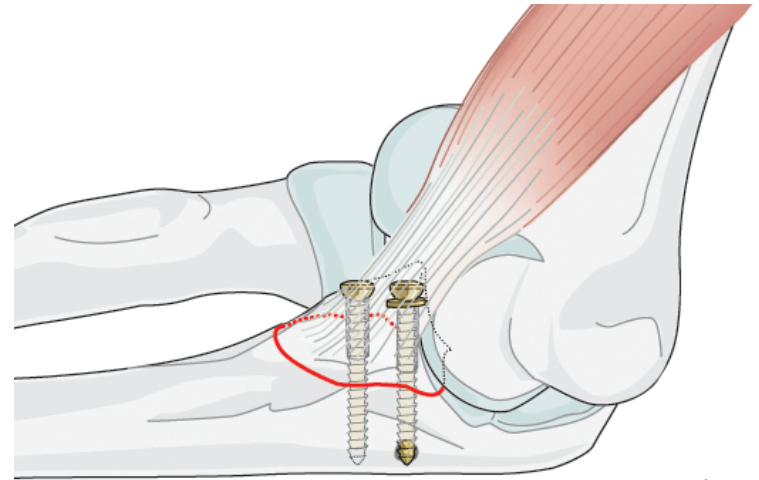
# Terrible triad

- 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



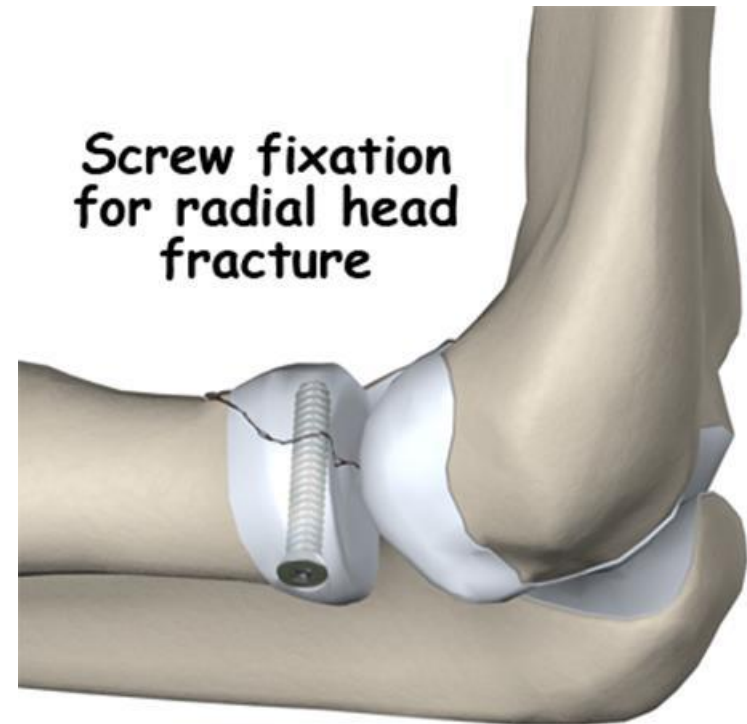
# Terrible triad

- 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



# Management of 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



# Radial head fractures

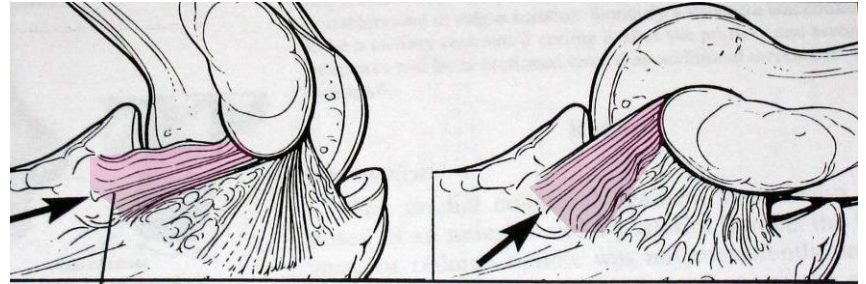
- If more than two fragments –  
ORIF is futile
  - Replace (or  
excise)



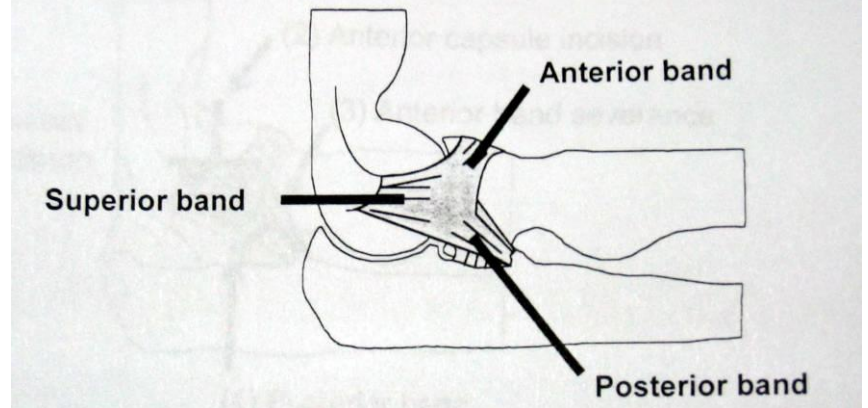
# Terrible triad

- 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



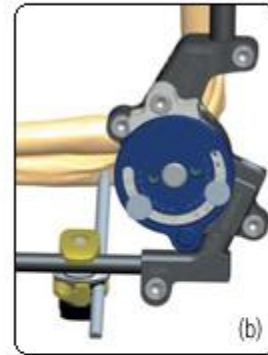
Medial collateral ligament



Lateral collateral ligament

# 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



# AP – instability (transolecranon fracture pattern)

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



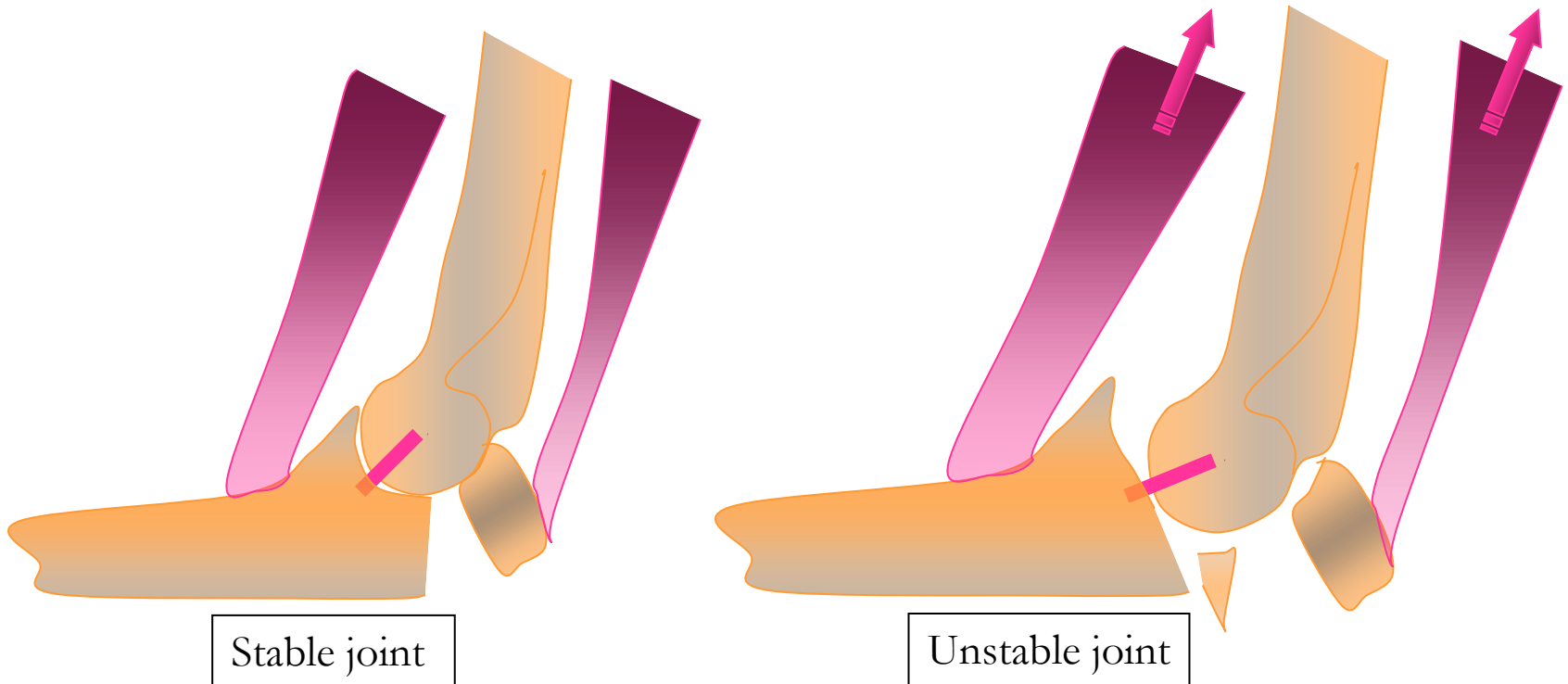
Simple pattern



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

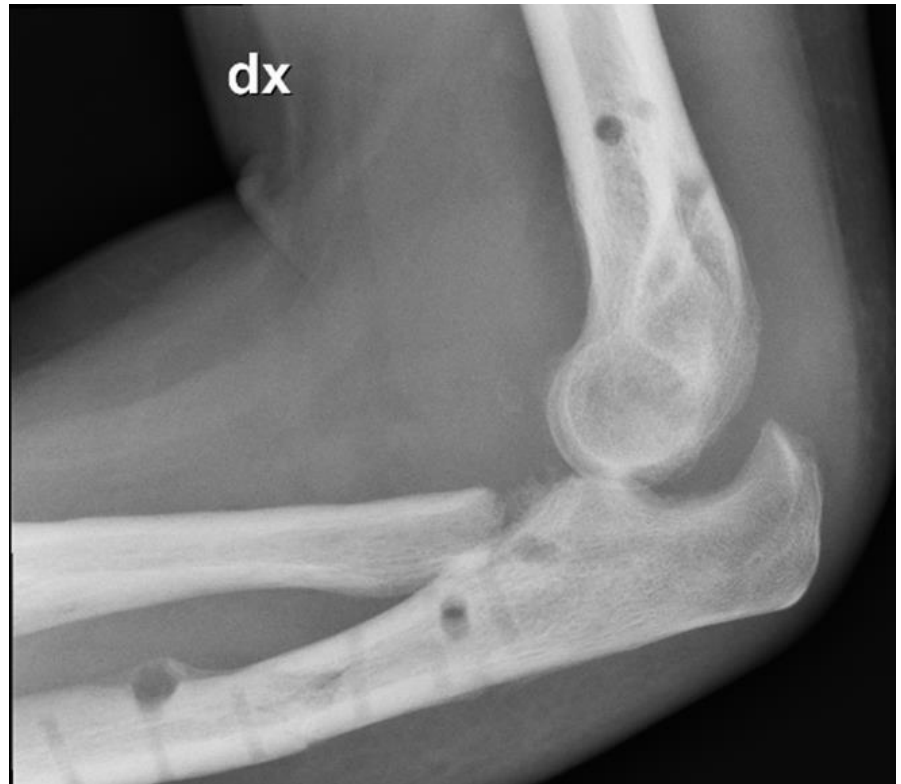




2 months later



- 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