

## Olecranon and Radial Head/Neck Fractures

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## Disclosures

- None pertinent to this presentation
- Journal Reviewer
  - Journal of Orthopaedic Trauma
  - Journal of American Academy of Orthopaedic Surgeons
  - Techniques in Orthopaedics

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## Olecranon Fractures

### Mechanism of Injury

- Rapid Tension Overload: Eccentric contraction of the triceps with flexion of the elbow
- Direct Trauma
- Chronic Overload: osteopenia, stress fracture

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## Olecranon Fractures

### Evaluation

- Skin Integrity
- Assess for active elbow extension
- Neurovascular exam
- Radiographs: AP, lateral, and oblique



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## Olecranon Fractures

### Treatment Goals

- Restore articular congruity
- Restore elbow extensor mechanism
- Rigid Fixation
- Achieve Stable arc of motion and prevent stiffness
  - Begin early range of motion
- Avoid Complications

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## Olecranon Fractures

### Indications for Operative Management

- Disruption of the Extensor Mechanism
  - Unable to actively extend
- Articular Incongruity
  - Any displaced fracture

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## Olecranon Fractures

### Treatment Options

- Open Reduction Internal Fixation
  - Tension Band
  - Plate Fixation
- Olecranon Excision and Triceps Advancement

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## Olecranon Fractures

### Positioning

- Lateral Decubitus
- Sterile Tourniquet
- Regional or General
- Direct Posterior Approach
- Padded Mayo



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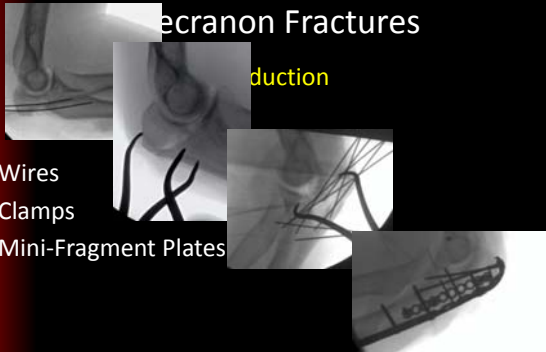
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## Olecranon Fractures

### Reduction

- Wires
- Clamps
- Mini-Fragment Plates



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### Olecranon Fractures

Simple Fractures

Tension band or Plate



The image contains four radiographic views of the elbow. The top-left shows a lateral view of an olecranon fracture with a tension band wire. The top-right shows an anterior view of an olecranon fracture with a tension band wire. The bottom-left shows a lateral view of an olecranon fracture with a locking plate. The bottom-right shows an anterior view of an olecranon fracture with a locking plate.

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### Olecranon Fractures

Comminuted Olecranon Fractures

Plate Fixation



The image contains four radiographic views of the elbow. The top-left shows a lateral view of a comminuted olecranon fracture. The top-right shows an anterior view of a comminuted olecranon fracture with a locking plate. The bottom-left shows a lateral view of a comminuted olecranon fracture with a locking plate. The bottom-right shows an anterior view of a comminuted olecranon fracture with a locking plate.

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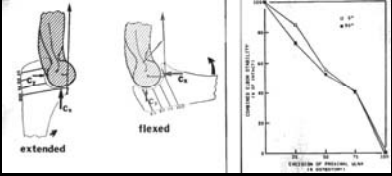
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### Olecranon Fractures

Olecranon Excision

- Olecranon critical in traumatic elbow instability
- Linear decrease in stability with incremental excision



The image contains two diagrams and a graph. The left diagram shows the olecranon in an extended position with labels  $L_1$ ,  $L_2$ , and  $L_3$ . The right diagram shows the olecranon in a flexed position with labels  $L_1$ ,  $L_2$ , and  $L_3$ . The graph plots 'Stability of the elbow' on the y-axis (0 to 100) against 'Percentage of olecranon excision' on the x-axis (0 to 100). The graph shows a linear decrease in stability as the percentage of olecranon excision increases. Two data series are shown: one for 0° and one for 90° of flexion.

An KN. Clin Orthop 209:270-279, 1986

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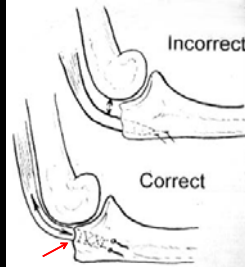
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## Olecranon Fractures

### Olecranon Excision

Osteoporosis  
<50% of the joint



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## Olecranon Fractures

### Post Operative Protocol

Non weight bearing for 6 weeks  
Splint 1 week to allow soft tissues to calm down  
Commence early PROM  
Progressive weight bearing after week 6

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## Radial Head Fractures



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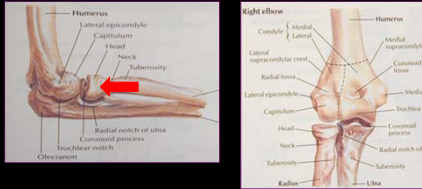
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# Radial Head Fractures

## Importance of the Radial Head

Strut to axial translation



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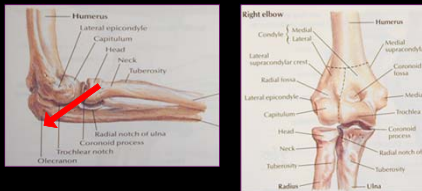
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# Radial Head Fractures

## Importance of the Radial Head

Resists posterior dislocation of the elbow



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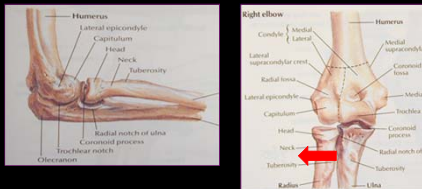
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# Radial Head Fractures

## Importance of the Radial Head

Provides Valgus Stability



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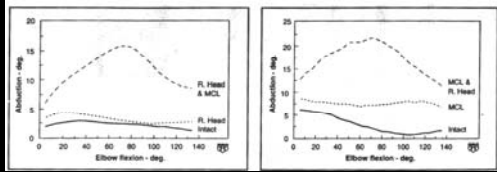
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## Radial Head Fractures

### Importance of the Radial Head

Radial head – 30% valgus stability with MCL intact (Hotchkiss et al. JOR, 1987)

Radial head important 2<sup>nd</sup> stabilizer to valgus stress without MCL



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## Radial Head Fractures

### Mechanism of Injury

- Typically Axial Load with combined valgus force
- Can be seen in high energy injuries
  - Elbow dislocation
  - Coronoid fracture
  - Collateral ligament injury

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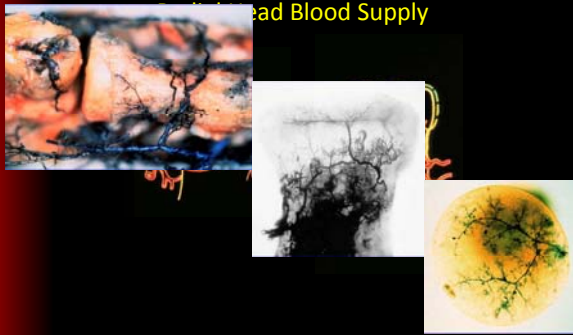
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## Radial Head Fractures

### Radial Head Blood Supply



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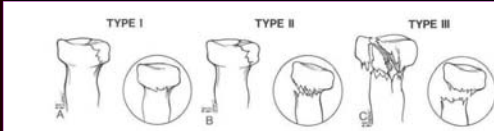
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## Radial Head Fractures

### Modified Mason Classification

- Type I: Nondisplaced  
No block to forearm rotation, displacement <2mm
- Type II: Displaced  
- Possible ORIF
- Type III  
- Irreparable  
- Replacement



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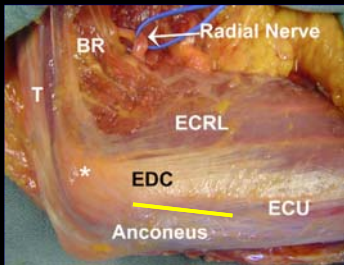
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## Radial Head Fractures

### Approaches

Kocher: Anconeus-ECU interval



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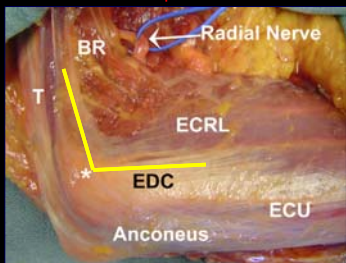
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## Radial Head Fractures

### Approaches

Kaplan

- Suprcondylar Ridge
- Anterior to mid-axis of RC
- Use LCL tear if present
- Anterior Capsule



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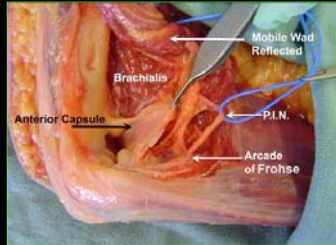
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## Radial Head Fractures

### Approaches

Arthrotomy: release visualized capsule and annular ligament



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## Radial Head Fractures

### Internal Fixation

- Repair radial head
- Secure radial head to radial neck
- Avoid impingement of plate with forearm rotation



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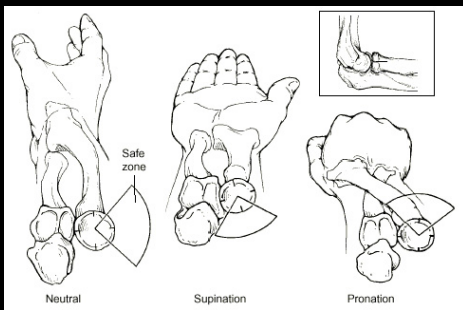
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## Radial Head Fractures

### Safe Zone for Fixation



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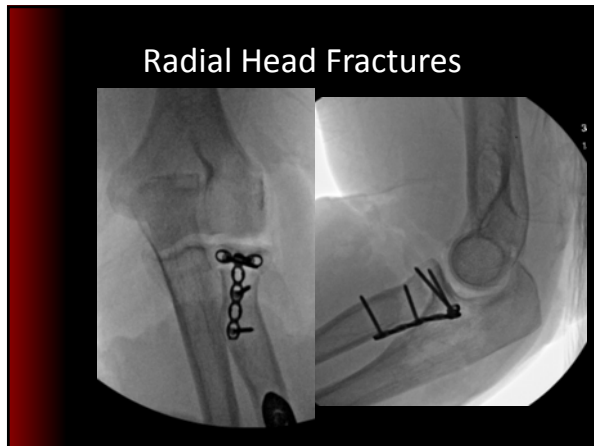
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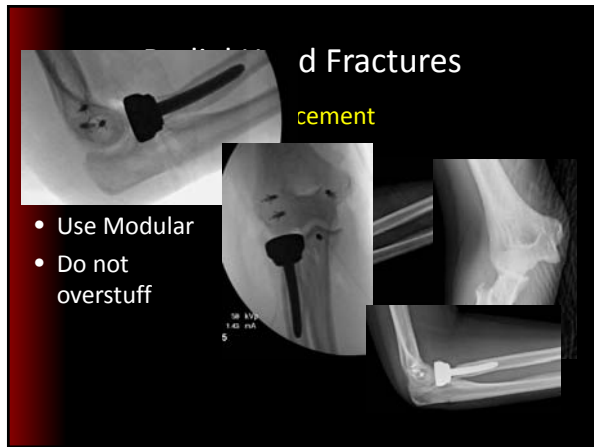
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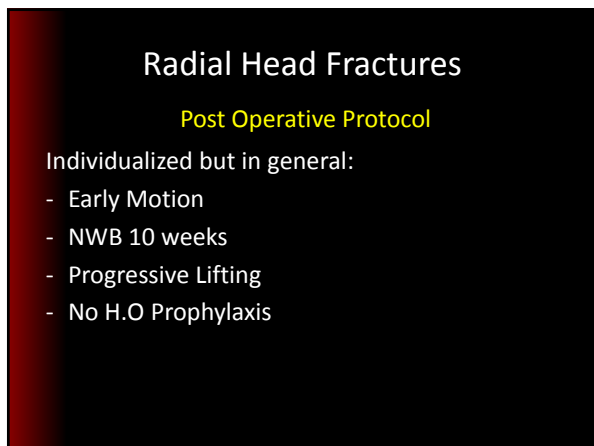
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# Radial Head Fractures

Thank You

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