Elbow Fracture Dislocations: My Algorithm

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Disclosures
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Definition: Fracture-Dislocation of the Elbow
• Dislocation
• Intra-articular fracture
Not All The Same!

Patterns of Elbow Instability with Fracture

Dislocation Injuries
- Radial Head Fracture
- Coronoid Fracture
- Transolecranion Fracture Dislocations

Disruption Injuries
- Anterior
- Anteromedial Facet Coronoid Fracture: Varus Instability
Dislocation vs. Disruption

Dislocation

Disruption

Disruption

Posterior Dislocation with Radial Head Fracture

Dislocations of the Elbow and Intraarticular Fractures

Per Oluf Jöfsson, M.D., Carl Fredrik Gentz, M.D., Olof Johnell, M.D., and Bo Wendberg, M.D.

23 patients

Excision of radial head and cast

INSTABILITY with CORONOID fractures (4 patients)
Terrible Triad
Posterior dislocation
Radial head fracture
Coronoid fracture

“Terrible Triad”
Ring, Jupiter, Zilberfarb JBJS 2002
11 patients
Regan and Morrey Type 2 coronoid fractures
7 redislocated in splint or cast
5 redislocated after operation
Only 4 patients with satisfactory results

Regan and Morrey
Terrible Triad

STANDARD SURGICAL PROTOCOL TO TREAT ELBOW DISLOCATIONS WITH RADIAL HEAD AND CORONOID FRACTURES

- fixation or replacement of the radial head
- fixation of the coronoid fracture if possible,
- repair of associated capsular and lateral ligamentous injuries,
- Select repair of the medial collateral ligament and/or adjuvant hinged external fixation

Terrible Trai

48 yo M

Terrible Trai

Closed reduction, unstable <60 deg extension
Type 2 Coronoid, Comminuted Radial Head

Terrible Triad Systematic Repair
1) Posterior Universal Incision (vs Lateral Incision)
2) Lateral Deep Interval (Kaplan vs Kocher)
   ...usually bare lateral epicondyle stripped of LUCL
3) Radial head fragment removal to access coronoid
4) Coronoid ORIF from lateral (screw, sutures, both)
   ... bail to medial coronoid approach if technical fail
5) Radial head ORIF vs replacement (commonly replaced)
6) LUCL repair (always)
7) Stability Assessment (repair MUCL if still unstable)
8) Static Ex-Fix if still unstable

4M ROM 10-135, 75/80
9 months Post-Op Terrible Traid

24 year old M– FOOSH, “no dislocation”, non-displaced coronoid fracture

24 year old M– FOOSH, “no dislocation”, MRI arthrogram OSH
90 deg Splint x 3 weeks

2 months after initial injury, FOOSH, now with dislocation requiring ER reduction
2 Months Post-Op

34 yo Male, skateboarding fall, AM Coronoid Fx
Varus posteromedial rotational instability

5 months, ROM 5-140
Varus Posteromedial Rotational Injuries

Inadequate Treatment

Olecranon Fracture-Dislocations/Disruptions

**Anterior:** Trans-Olecranon Fracture
**Posterior:** Posterior Monteggia Variant

**ANTERIOR:** Trans-Olecranon Fracture-Dislocation
Principles of Treatment – Trans-Olecranon Fx-Disloc

- Fixation of Coronoid Important
- Fixation of Sublime Tubercle (MCL) and Supinator Crest (LUCL)
- Restore olecranon articular surface to trochlea
- Contoured dorsal plate to match Proximal Ulnar Diaphyseal Angle “PUDA”
- Bridge comminution

Surgical Approach to Coronoid?
Posterior thru olecranon fracture (like osteotomy)
Surgical Approach to Coronoid?
Medial thru cubital tunnel floor or FCU split

15 yo Girl, Fall down 2 flights

Trans-Olecranon Fx-Dislocation (anterior)
Trans-Olecranon Fx-Dislocation (anterior)
Distal Humerus Trochlear Sheer Fx

Work thru Olecranon Fx
Repair Distal Humerus Fx
2 Years Post-OP: 5-145

52 yo Psychiatrist – fall in Amsterdam
Trans-Olecranon
Posterior Monteggia Variant

Ligaments Likely Intact
Comminuted Radial Head, Coronoid Intact, Supinator Crest Fracture

2.5 months post-op
ROM 25-130, 70/65

1.5 years
“...my arm feels normal, and I can do everything that I formerly was able to physically accomplish. I am working out on a regular basis...”
Summary - Trans-Olecranon Fx Dislocation

Fix Coronoid First thru Olecranon Fracture
Fix MCL/LUCL Fx Avulsions:
  Sublime Tubercle and Supinator Crest
Restore olecranon articular surface to trochlea
Contoured dorsal plate
to match Proximal Ulnar
Diaphyseal Angle “PUDA”
Bridge comminution

Patterns of Elbow Instability with Fracture

Dislocation Injuries
  Radial Head Fracture
  Coronoid Fracture
  Trans Olecranon Fracture-Dislocations

Disruption Injuries
  Anterior
  Posterior
  Varus posteromedial rotational instability

Summary: Elbow Fracture Dislocations

Fx-Dislocation different than Fx-Disruption (trans olec)
Recognize the various injury patterns
Systematic Approach to Terrible Triad
Appreciate Trans-Olec Fx Variants
LCL is more important than the MUCL
MUCL will heal if you keep joint concentric
Even small coronoid fractures can be a BIG problem
Watch out for AM coronoid facet fracture and fix LUCL if Varus unstable
Thank You!

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