Traumatic Elbow Instability

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Simple Elbow Dislocation

- No associated fractures
- Complete or near complete capsuloligamentous injury
- Extensive muscle injury
- Nearly always stable after reduction
- No advantage to surgery if stable
- No more than 2 weeks immobilization
Elbow Dislocation

- Usually posterolateral
  - Can dislocate with anterior band of MCL intact
- Posteromedial pattern
  - Less common
  - Possibly more unstable
Slight Subluxation

“Drop Sign”

• This is like pseudo-subluxation in the shoulder.
• The combination of extensive muscle and ligament injury and guarding due to pain create a slight sag.
• IMPORTANT: distinguish from subluxation that will cause articular damage.
Slight Subluxation

“Drop Sign”
Management:
• Avoid varus stress (shoulder abduction)
• Active flexion
• Overhead exercises
Unstable Simple Elbow Dislocation

- Uncommon
- Older women (simple fall)
- Young men (high-energy)
Unstable Simple Elbow Dislocation

- Ligament / muscle reattachment to epicondyles
- External fixation
- Cross pinning
Cross Pinning

- Useful bail out
- Stiff and located is preferred to subluxation
- Stiffness usually worked out easily
- 2.0mm pins exit proximally for retrieval in case of breakage
- Can be placed with local
- Only needed for 3 weeks. Bury if needed longer
Chronic Simple Elbow Dislocation

Jupiter and Ring JBJS 2002

Treatment: Open reduction and hinged external fixation
No ligament reconstruction

5 patients: dislocated for 2 to 9 months
Stable elbow, > 100 degrees motion in all patients
Medial Collateral Ligament Insufficiency

- Throwing athletes
- Chronic attenuation
- Inability to throw 95 mph fastballs
LCL Insufficiency

Recurrent Simple Elbow Dislocation

- Insufficiency of the lateral collateral ligament
- Adolescent elbow dislocation
- Iatrogenic
Traumatic Elbow Instability Associated with Fractures
Definition

Fracture-dislocation of the elbow

– Dislocation of the elbow

– Intra-articular fracture
Definition

Traumatic Elbow Instability
– Injury that destabilizes the elbow
  – With or without dislocation
Patterns of Traumatic Elbow Instability With Fracture

Dislocation with Articular Fracture

Dislocation + radial head fracture

Olecranon Fracture-Dislocations

Anterior

Terrible Triad

Varus posteromedial rotational instability

Posterior
Dislocation vs. Disruption
Dislocation vs. Disruption

Dislocation

Disruption
Dislocation vs. Disruption

Dislocation

Disruption

Ligaments Partially Spared
Disruption

Ligaments Partially Spared
Patterns of Traumatic Elbow Instability With Fracture

**Dislocation Injuries**
- Dislocation with Articular Fracture
  - Dislocation + radial head fracture
- Terrible Triad

**Disruption Injuries**
- Olecranon Fracture-Dislocations
  - Anterior
  - Posterior
- Varus posteromedial rotational instability
Posterior Dislocation + Radial Head Fracture
Posterior Dislocation + Radial Head Fracture

Results of Treatment of Fracture-Dislocations of the Elbow

MARK A. BROBERG, M.D.,* AND BERNARD F. MORREY, M.D.**

24 patients
Ulnohumeral dislocation with radial head fracture
Cast 1 month +/- radial head resection
“Results better than generally thought”
Secondary procedures for radial head
No problems with instability
Posterior Dislocation + Radial Head Fracture

23 patients
Excision of radial head and cast
INSTABILITY in patients with CORONOID fractures (4 patients)
Terrible Triad

Posterior dislocation
Radial head fracture
Coronoid fracture
Terrible Triad

Only patients with INSTABILITY had CORONOID fractures (4 patients)
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
Terrible Triad

Pugh DM, Wild LM, Schemitsch EH, King GJ, McKee MD

Standard surgical protocol to treat elbow dislocations with radial head and coronoid fractures.

Regan and Morrey

Based on single lateral radiograph

- Type 1: Tip avulsion
- Type 2: < 50% coronoid height
- Type 3: > 50% coronoid height
O’ Driscoll Classification
Olecranon Fracture-Dislocations

**Anterior** (trans-olecranon) fracture-dislocations

**Posterior** (posterior Monteggia) fracture-dislocations
Anterior (Trans-Olecranon Fracture-Dislocation of the Olecranon)
Anterior (Trans-Olecranon) Fracture-Dislocation of the Olecranon
Posterior Fracture-Dislocation of the Olecranon

POSTERIOR MONTEGGIA TYPE FRACTURE-DISLOCATION
Posterior Fracture-Dislocation of the Olecranon

POSTERIOR MONTEGGIA TYPE  FRACTURE-DISLOCATION
Principles of Treatment

Restore contour and dimensions of trochlear notch
Contoured dorsal plate
Fixation of coronoid
Bridge fragmentation
Treatment Tips

• Pin the olecranon to the trochlea
• Consider a temporary external fixator for a complex fracture
Coronoid Exposure

• Through an olecranon fracture
• Lateral
  • Kaplan interval with elevation of ECRL origin
  • Removal of radial head fragments
• Medial
  • Over the top (tip)
  • Split in FCU by ulnar nerve (medial facet)
  • Elevate entire flexor-pronator mass from dorsal (base fracture)
Coronoid Provisional Fixation

- Coronoid fixation with plate then reduce and fix olecranon
- Pin fragments to trochlea
  - Need to immobilize the elbow
Exercises During Recovery

• If the LCL is injured, avoid varus stress (shoulder abduction) for 3-4 weeks. Overhead exercises can be helpful.
• If fixation is tenuous a 3-4 week period of immobilization is acceptable
• Active, self-assisted elbow flexion and extension and forearm rotation are the key
• Encourage patients to get into a “healthy stretch” mindset. It hurts, but it helps.
Summary

The LCL is more important than the MCL.
The ligaments will heal if you keep the elbow concentric, even when treated late.
Active motion adds to stability (avoid varus stress).
Even small coronoid fractures can be a problem.
Patterns of Traumatic Elbow Instability With Fracture

**Dislocation Injuries**
- Dislocation with Articular Fracture
  - Dislocation + radial head fracture
- Terrible Triad

**Disruption Injuries**
- Olecranon Fracture-Dislocations
  - Anterior
  - Posterior
- Varus posteromedial rotational instability
Review Articles for Reference


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