

ADULT ELBOW INJURIES



DISCLOSURES

- Neither I, David Olson, nor any family member(s), have any relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation.

ELBOW INJURIES

- Numerous injuries from overuse to acute traumatic injuries
- Some unique aspects in Adults
- Variety of treatment options
 - Medication
 - Injections/Biologics
 - Rehab/PT
 - Bracing
 - Surgical

ELBOW ANATOMY

- Knowing the anatomy is often key in making our diagnosis in elbow injuries
- Will discuss some for specific injuries



ELBOW INJURIES

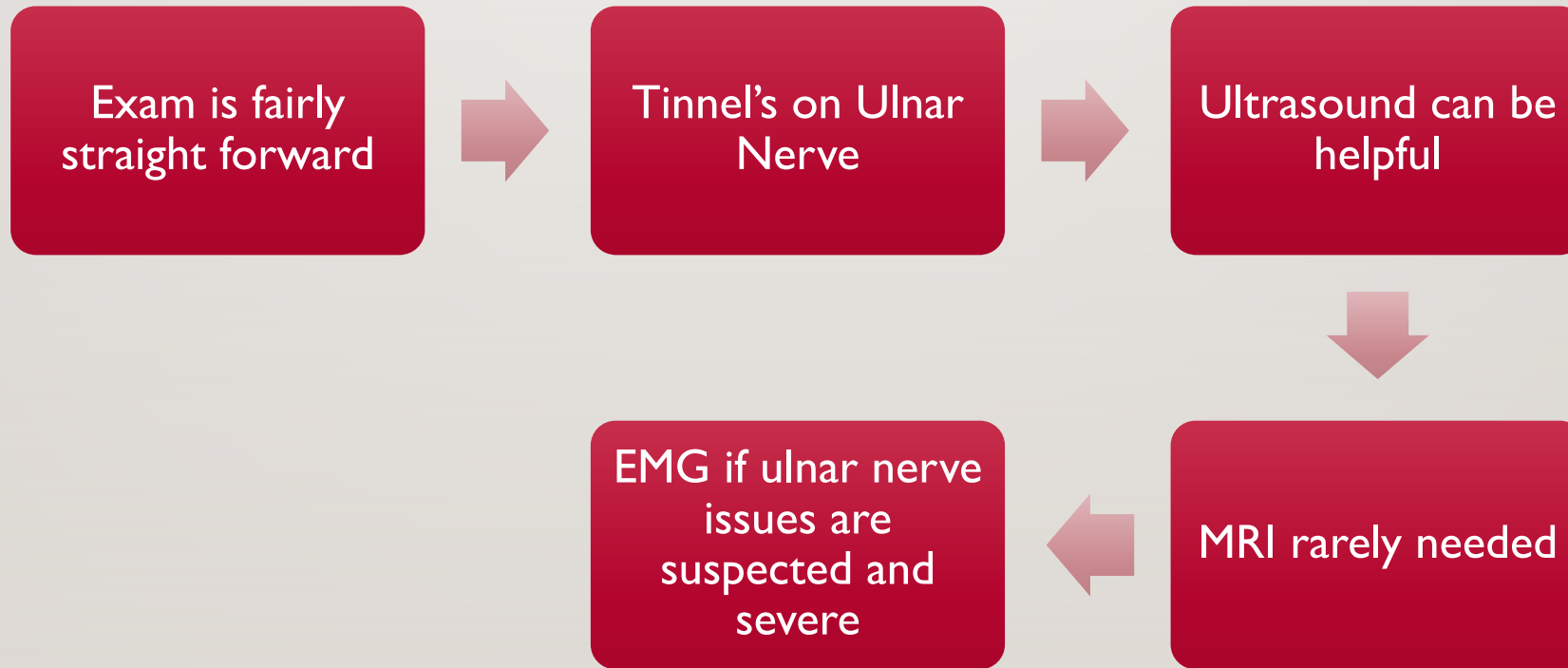
- Medial/Lateral Epicondylitis
 - Golfers/Tennis Elbow
- Olecranon bursitis
- Tendinopathy
- Dislocation
- Fractures
- Nerve Entrapments (Board Questions)
- Elbow OCD Lesions
- UCL Injuries (more to come)



MEDIAL/LATERAL EPICONDYLITIS

- Golfers and Tennis Elbow
- Overuse syndrome with from repetitive eccentric load to the flexor-pronator mass/extensor carpi radialis brevis at the epicondyles of the elbow
- Insidious onset of pain
- Diagnosis often clear with TTP at epicondyle and pain with wristed flexion or extension
- Medial is 5-10x less common than Lateral
- Dominant extremity 75+% of the time
- Middle age
- Racket sports (grip size)
- Check for Ulnar Nerve Symptoms

EVALUATION



TREATMENT

- Ice
- NSAIDS
- Bracing
- Sport equipment and technique eval
- PT
- Extracorporeal Shockwave Therapy
 - Not great evidence to support
 - Short term analgesia



TREATMENT

- Injections – often a discussion with this
 - Steroid Injections carry risk of skin bleaching, tendon weakening, tissue atrophy and ulnar nerve injury
 - Biologics
 - PRP or other blood injections
- Most studies done have shown intermediate improvement in pain and elbow function with blood products vs short term improvement with steroid
- Operative
 - Debridement sometimes considered if greater than 6 months of treatment fails
 - Outcomes worse if ulnar nerve issues are present as well

OLECRANON BURSITIS

- Inflammation and swelling of the bursae protecting the posterior elbow
- Acute trauma/direct blow
- Overuse/repetitive trauma
- Compression/ICE/NSAIDS/Padding-Protection
- Rarely Drain/Inject



TENDINOPATHY



Around the elbow can be:

Triceps
Biceps



Overuse/Overtraining

Lifting technique
Repetitive activity at practice

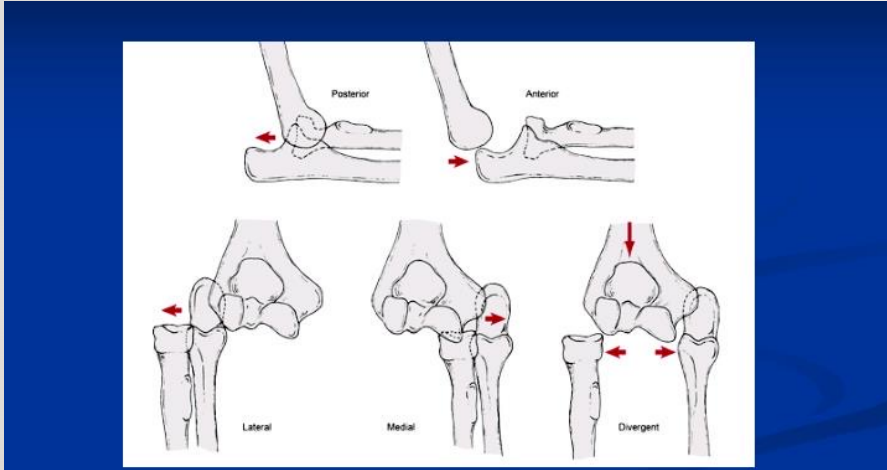


Treatment

Rest, Nsaids, Technique eval, PT/Rehab,
Biologics, Surgical

ELBOW DISLOCATIONS

- 3rd most common after finger/shoulder (20%)
- Posterior (80%)
- FOOSH with Elbow extended
- Can be perched (easy) or fully out (tricky) to relocate
- Always check neuro before and after reduction
 - 2 "gentle" attempts
 - Standing/Prone methods my favorites
- Xray when able for associated fractures
- Often get MRI to assess associated ligament/soft tissue injury
- Return to play
 - Depends on sport, function and ability to brace without allowing full extension



CLASSIFICATION OF ELBOW DISLOCATIONS

REDUCTION OF POSTERIOR ELBOW DISLOCATIONS



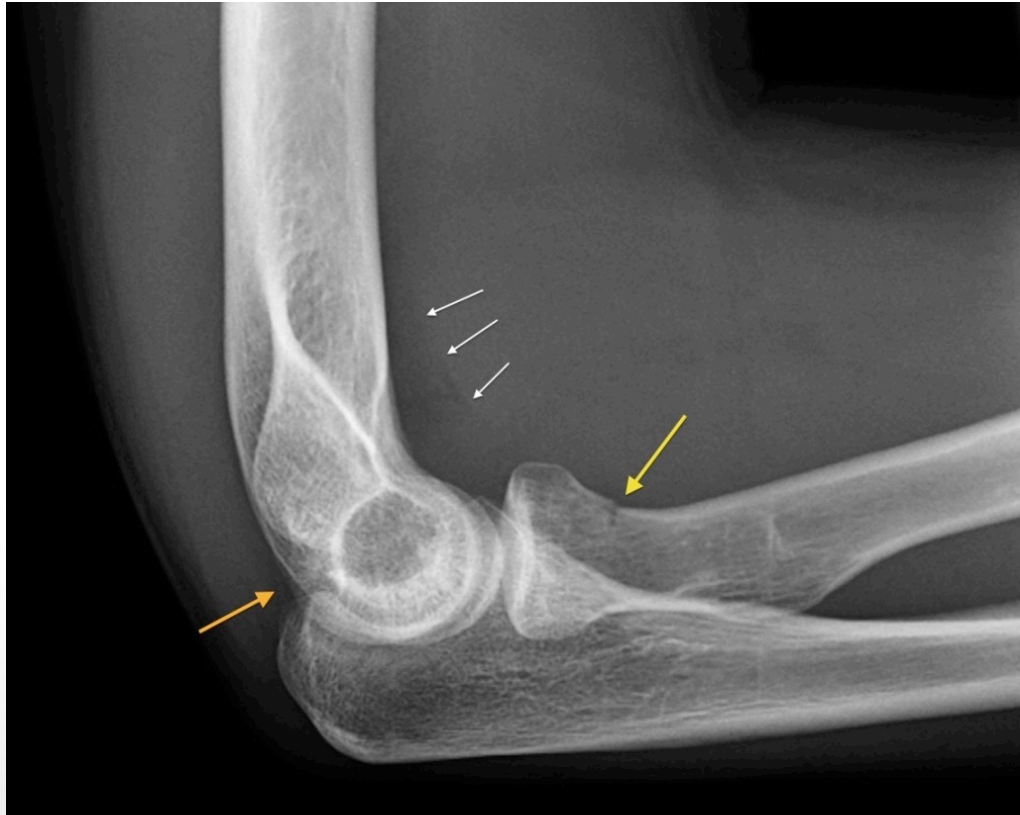
ELBOW FRACTURES

- Trauma from falls in sport with direct blow from another athlete, stick or playing surface
- MONITOR NEURO STATUS
- Evaluate and immobilize at event/game
- Transport for imaging and further management

ELBOW FRACTURES

- Capitulum Fractures
 - 3 types from minimal displacement to comminuted
- Humeral Fractures
- Radial Head Fractures
 - Often FOOSH injuries

RADIAL HEAD FRACTURE



- FOOSH
- Can be very subtle on x-ray
- Look for anterior “Sail” and Post Fat Pad (fluid in joint)
- Likely fracture with these, even if fracture not visualized

ELBOW NERVE ENTRAPMENTS

- Cubital Tunnel
- Posterior Interosseous Nerve Entrapment
 - Branch of radial nerve (post cord of brachial plexus)
 - Motor to the post forearm
 - Weakness in thumb and finger extension – spares wrist extension
 - Self limited
- Radial Tunnel Syndrome
 - Pain only – no motor. Dorsal and radial achy pain. Can mimic tennis elbow...

CUBITAL TUNNEL SYNDROME

- 2nd most common peripheral nerve entrapment
- Cubital tunnel is formed by the retinaculum which forms a small tunnel between it and the medial epicondyle and olecranon. The floor of the tunnel is the UCL
- 5 areas the ulnar nerve can be compressed about the elbow - cubital tunnel is most common
- Ulnar nerve symptoms are the result
 - Little and ring finger paresthesia and pain
 - Grip issues later
- Repetitive activities, diabetes, prolonged elbow flexion
- Froment's Sign – clawing of the ulnar digits
- Wartenberg's Sign – abduction of the little finger
- EMG helps confirm
- Avoid exacerbating activity, PT but surgery if severe on EMG/Exam

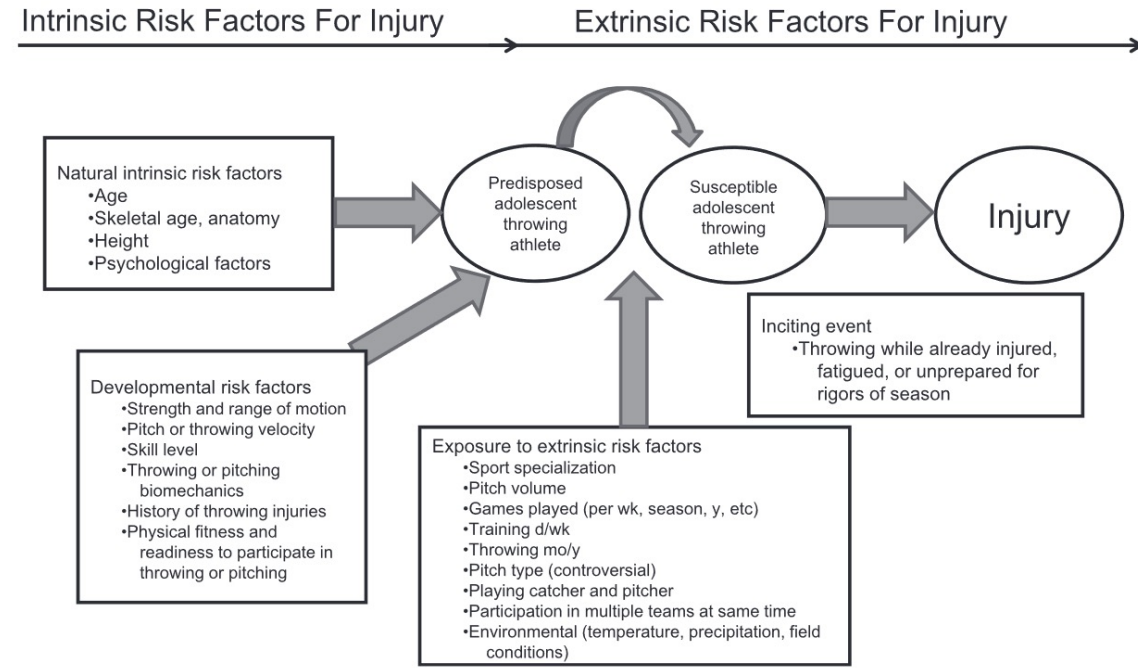
ELBOW OCD LESIONS

- Inflammatory pathology of the bone and cartilage
- Can result in localized necrosis and fragmentation
- Most common in capitellum of the dominant arm
- Throwers and gymnasts
- Kids often do better than adults

ULNAR COLLATERAL LIGAMENT INJURIES

- Always a hot topic in sports medicine
- Common issue in baseball pitchers and other throwing athletes
- Non-Surgical vs Surgical management options
- Whole conferences are dedicated to this topic!

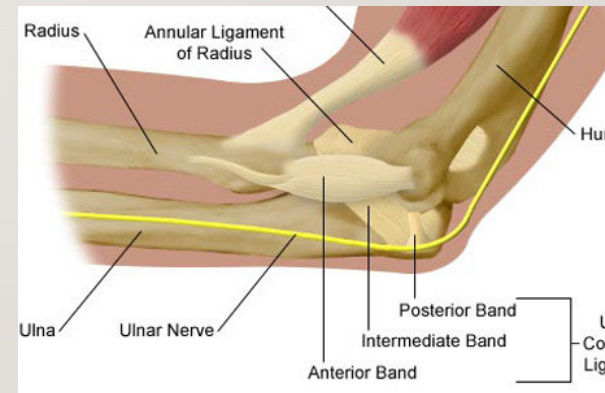
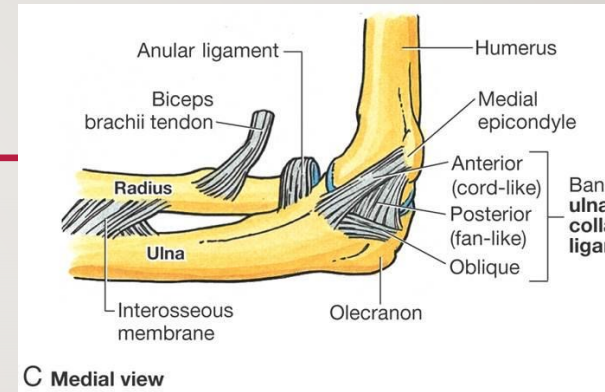
A Model for Injury Causality in Adolescent Throwing Athletes



INJURY IN THROWERS

UCL ANATOMY - REVIEW

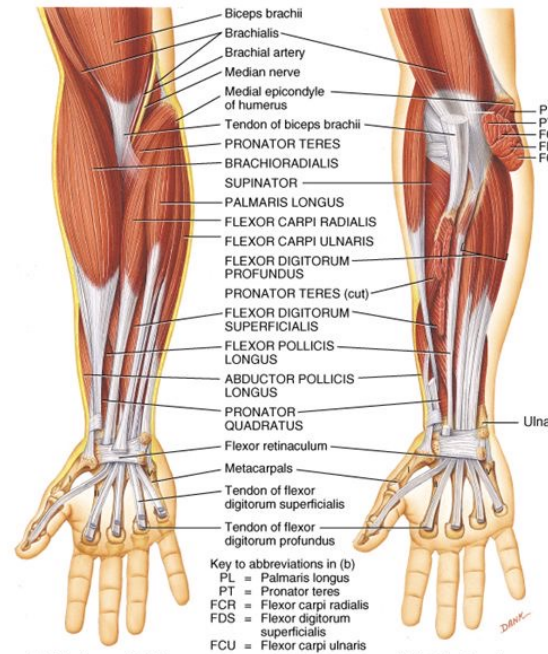
- 3 Bands: Anterior, Oblique, and Posterior
- Anterior Band typically most affected
- Oblique/Intermediate Band unites the Anterior and Posterior



FLEXOR-PRONATOR MASS

- After the UCL bundle, the flexor-pronator mass absorbs the highest amount of valgus force across the elbow during throwing activities.
- Dynamic stabilizers and help prevent injury to the ligaments through repetitive contraction, predominantly during the acceleration phase of throwing and in wrist flexion during ball release.

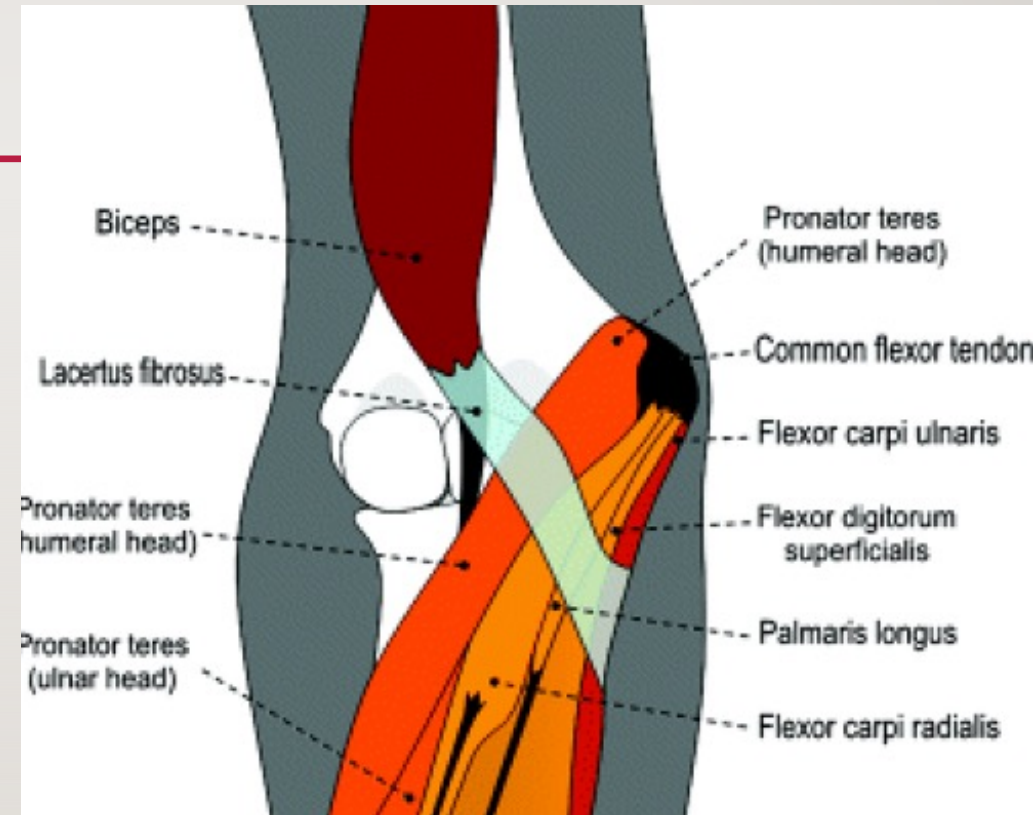
Muscle that Pronate & Flex



- **Pronator teres**
 - medial epicondyle to radius so contraction turns palm of hand down towards floor
- **Flexor carpi muscles**
 - radialis
 - ulnaris
- **Flexor digitorum muscles**
 - superficialis
 - profundus
- **Flexor pollicis**
 - longus
 - brevis

FLEXOR-PRONATOR MASS

- If the UCL is compromised, the flexor-pronator mass becomes the primary dynamic valgus stabilizer of the elbow.
- Combined UCL and flexor-pronator mass injuries are a subset of medial elbow injuries sustained by overhead throwing athletes.



ANATOMY REVIEW

- **Anterior band** = chief restraint to valgus stress up to 90° of flexion.
 - Any flexion beyond 90° renders the anterior band's role secondary in resisting valgus stress.
- Posterior band = function in resisting valgus stress is most important between 60° and full flexion
 - Posterior band is more important in the overhead-throwing athlete due to the fact its primary role in resisting valgus stress occurs at **higher degrees of flexion.**
- The oblique bundles of the UCL complex have lesser roles in maintaining elbow stability

PURPOSE OF THE UCL

Resistor of valgus loads

Elbow joint stability by slowing elbow extension during the deceleration phase

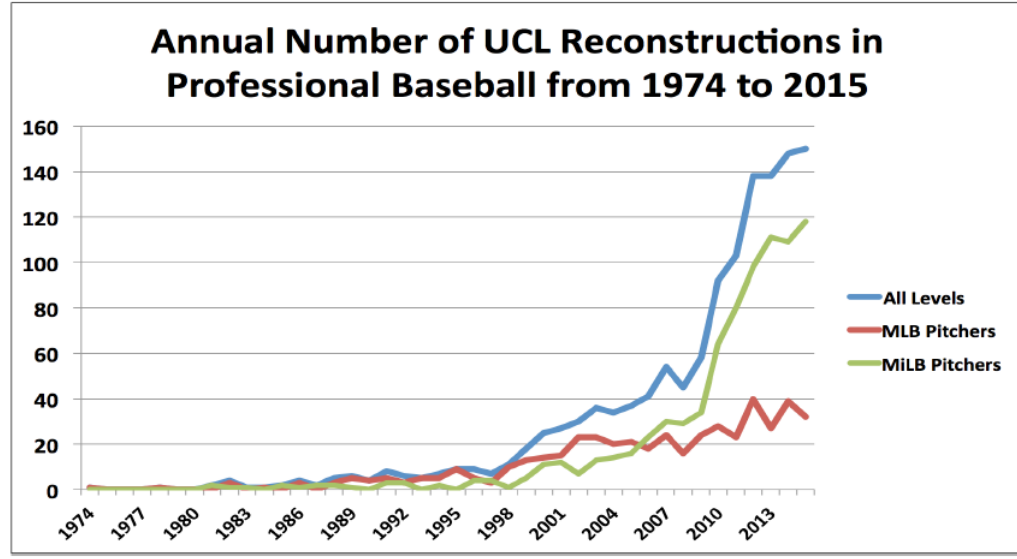
Generate a varus torque counterbalancing the pitch mechanic induced valgus force →
Creating dynamic joint stability

REASONS BEHIND UCL INJURIES

- Overuse
- Biomechanics
- Kinetic Chain Defects
- Weighted Ball/Velocity Programs
- Sports Specialization
- Prior Injury



NUMBERS OF INJURIES AND SURGERIES ARE RISING



- Camp CS, et al study, taken from Conte S presentation at PBATS conference 2017.



LEVELS/LOCATION OF UCL INJURIES

- Low Grade
- High Grade
- Complete
- Proximal
- Mid
- Distal

TREATMENT OF UCL INJURIES

Rest

Rehabilitation

- Position Important (P, C)
- DH, 1B, 2B

RTP/ITP

Unique Circumstances

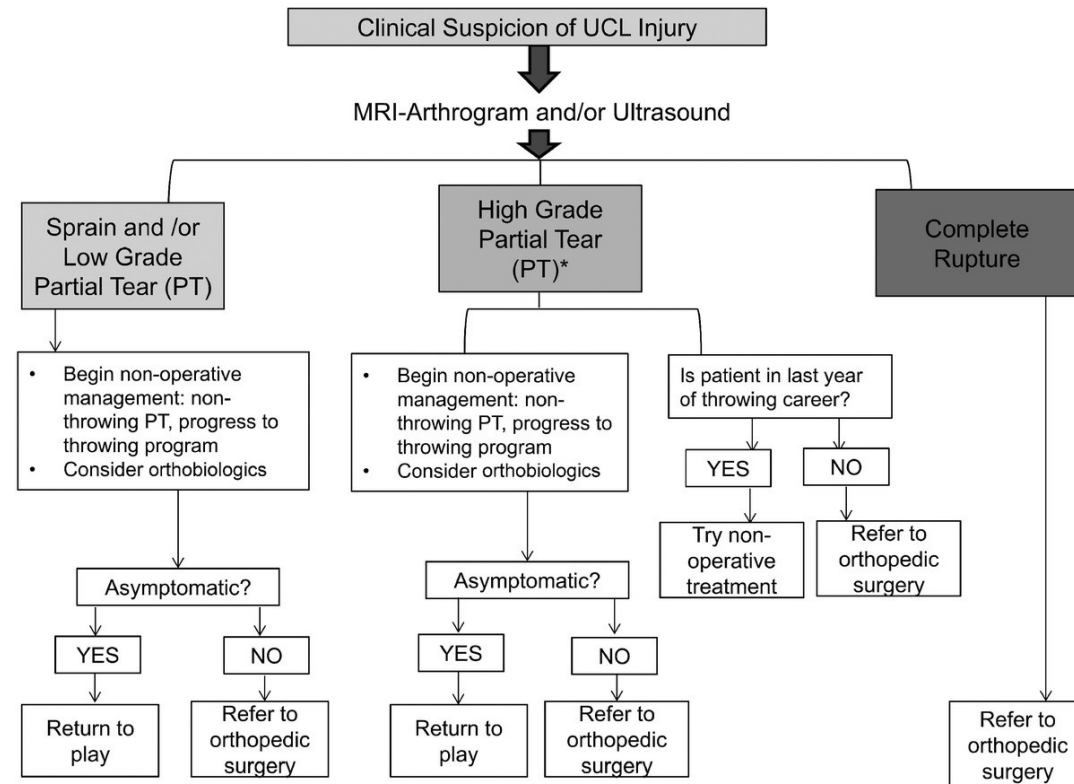
- RHD Throw, LH Hitter (see: S. Otani)

Orthobiologic Treatment

Surgical (Reconstruction
v Internal Bracing)

- -Defer to our surgical colleagues
- -Important to review commitment to rehabilitation

TREATMENT OPTIONS



*distal injuries are less likely to respond to non-operative treatment MEDICINE REPORTS

NON-SURGICAL UCL TREATMENT

- Common injury with known success rate in surgical management
- RTP rates in non-operative management of partial UCL tears are not as well known in the literature
 - Variety of protocols on how long to rest, when to start PT and length of return to throw
- So, is there evidence in non-op treatment of partial UCL tears in high level athletes???

NON-SURGICAL UCL TREATMENT

- The best studies looked at not only the non-op care (rest, PT, Injection or not), but also location and severity of the injury
- Low grade partial tears had almost 100% success rate of return to high level throwing with rest, PT and return to throw
- Moderate grade partial tears had 66%-94% success rates
- Gives us Level C evidence for Non-Op RTP of partial tears
- Have to take things on an individual basis and have an in-depth discussion with our athletes

NON-OP UCL RTP – DO WE ADD PRP??

- 2019 MLB Study by Camp et al
- Non-op UCL management with and without addition of PRP injections
- 544 non-op UCL MLB pitchers – 133 received PRP injection as part of treatment
- Single Radiologist read MRIs for location and severity to help match athletes
- Non-op overall had 54% RTP rate
- PRP group had significant increase in return to throw time
- Other-wise the use of PRP was not found to help RTP rates or reduce need for surgery
- In this study location of tear was also not found to effect RTP as much as previously thought
- Other studies showed some support for PRP (more to come!!)

Nonoperative Treatment of Elbow Ulnar Collateral Ligament Injuries With and Without Platelet-Rich Plasma in Professional Baseball Players: A Comparative and Matched Cohort Analysis. Camp et al



RETURN TO THROW PROGRAMS

- Again – a long talk in itself!
- UCL injuries - we go through a progression
 - Rest
 - Non throwing rehab exercise
 - Return to throw program
- Programs post surgery usually after 16 weeks rest (varies)
- Non-op return to throw focus on stages:
 - ROM
 - Increased ROM, Strength and Stability
 - Depending on the protocol and athlete's function (7-12 weeks) the throwing ramp up starts and the athlete advances based on objective measures as well as pain reports

UCL CONCLUSION

- There is evidence to show that Non-Operative care can have great success with certain UCL injuries
- We are still sorting other therapies that can help the success in Non-Op UCL management
- Selection for Non-Op vs Surgical management is multi-factorial and needs to be an open discussion with our athletes and their support teams

CONCLUSION

Many elbow injuries are possible in our adult athlete population

Knowing the anatomy and common types of injuries are the key to helping our patients in the clinic and during coverage

Always confirm intact neuro status in your patients with traumatic injuries

There are many types of rehab, meds, bracing and injections that can help our patients without always needing surgery



THANK
YOU!

