Elbow Injuries in the Throwing Athlete
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Elbow Anatomy
• Anterior band of ulnar collateral ligament is primary stabilizer to valgus stress
• Anterior band is tight in extension
• Posterior band is tight in flexion

Elbow Biomechanics
• Angular velocity 3,000 deg/sec
• Elbow extends from 110 to 20 deg
• Valgus torque is 64 N/m
• Ultimate strength cadaveric UCL is 33 N/m

Repetitive Stress in the Throwing Elbow
• SHEAR in posterior compartment (olecranon fossa, posteromedial olecranon tip)
• COMPRESSION on lateral side (radiocapitellar joint)
• TENSION on medial side (UCL, flexor–pronator, medial epicondyle)

Posterior Elbow Pain
• Olecranon stress fracture
• Posteromedial impingement
• Valgus extension overload

Lateral Elbow Pain
• Radiocapitellar plica
• Capitellar osteochondritis dissecans
• Radiocapitellar arthrosis

Medial Elbow Pain
• Medial epicondylosis
• Medial epicondylar apophysitis
• Ulnar collateral ligament (UCL) injury

Clinical History
• Repetitive overhead throwing
• Medial elbow pain during late cocking or acceleration phase
• Acute “pop” & sharp pain
• Gradual onset over time
• Pain with loss of velocity

Physical Exam
• UCL point tenderness
• Valgus stress instability
• Milking maneuver
10 Imaging Studies
   • Plain radiographs
   • Valgus stress radiograph
   • Conventional MRI
   • MR - arthrography
   • Dynamic ultrasonography

11 Nonoperative Treatment
   Partial UCL Tear
   • Rest for 6 to 12 weeks
   • Flexor-pronator strengthening
   • If asymptomatic, return to throwing
   • Optimal throwing mechanics
   • Return to throwing protocol

12 UCL Reconstruction
   Indications for Surgery
   • Competitive thrower
   • Complete UCL tear
   • Failed nonoperative treatment for partial UCL tear

13 “Tommy John Surgery”
   • Major league pitcher
   • 26 seasons (1963–1989)
   • UCL reconstruction 1974
   • 164 of 288 career wins after elbow surgery

14 UCL Reconstruction
   Surgical Technique
   • Medial approach
   • Protect, transpose ulnar nerve
   • Bony tunnels in ulna, humerus
   • Palmaris longus autograft
   • Maximize graft across joint
   • Incorporate graft, native tissue

15 Postop Rehabilitation
   • Immobilization for 10 days
   • Elbow ROM, avoid valgus stress
   • Strengthening at 6 weeks
   • Short toss at 4 months
   • 50% velocity at 7 months
   • 75% velocity at 9 months
   • Return to competition at 1 year

16 How to Play It Safe
   • Avoid curveballs (high torque)
   • Limit number of pitches
   • Four days rest after throwing maximum number of pitches
17 References
