Surgical Procedures
Elbow

Objectives
- Learn the common surgical procedures involving the elbow joint
- Think about the impact of surgical procedures of the elbow on the examination and treatment of patients
Fractures

Fractures
  > Distal humerus fractures
    • Supracondylar fracture
    • Avulsion fracture
    • Condylar fracture
    • Intercondylar fracture
    • Transcondylar fracture
  > Radial head fractures
  > Radial/ulnar mid-shaft

Fractures
Displaced Transcondylar Fracture
Fractures
Transcondylar Fracture with Borderline Supracondylar Fracture

Fractures
Lateral Condylar Fracture with Screw Fixation
Fractures
Medial Condylar Fracture with Screw Fixation

Fractures
Comminuted Humeral Fracture
Fractures

Surgical intervention:
- Radial head and neck fracture (1/3)
  - Results from FOOSH
  - Injury includes posterior dislocation and ligament injury
  - If fracture comminuted, surgical intervention required
    - 2 methods:
      - Internal fixation
      - Radial head excision
  - Intra and extra-articular surgery also used for long-standing joint disease

Radial head excision
- Indications:
  - Severe fractures/dislocations of radial head
  - Chronic synovitis and deterioration of articular surface
- Contraindications:
  - Growing children
- Procedure:
  - Decision on implant to replace radial head
    - Metal, ceramic, or polyethylene implants used
  - Lateral incision to spare triceps just anterior to LCL
  - Radial osteotomy performed at level of annular ligament
  - Synovectomy performed if synovitis present
  - Implant placed and ligaments repaired if necessary
    - Reinforcement with allograft or autograft
Fractures

- Insert “Radial head fracture 1” video here

- Insert “Radial head fracture 2” video here
Total Elbow Arthroplasty

- **Indications:**
  - Severe joint pain and damage to articular surface
  - Gross instability
  - Acute intra-articular, comminuted fractures and non-union fractures
  - Failed arthroplasty or radial head resection
  - Marked bilateral limitation of motion of elbows

- **Contraindications:**
  - Active infection (A)
  - Paralysis of elbow musculature (A)
  - Unrepairable ligaments (R)
  - Inadequate control of elbow extensors (R)
  - Heterotropic ossification or pain-free ankylosis (R)
  - Insufficient bone stock (R)
  - Young patient who needs to lift heavy loads (R)
Total Elbow Arthroplasty

Procedure:
- Include humeral and ulnar components
- Initial implants developed lacked varus and valgus movement as well as rotation
- Designs classified in 2 broad categories:
  - Linked (articulated)
    - Referred to as semi-constrained
  - Unlinked (nonarticulated)
    - Composed of two separate, non-articulated implants
    - Referred to as resurfacing replacements
- Most recent advancement is hybrid design
- Use will dictate stability and need for stability from soft tissue

Total Elbow Arthroplasty

Operative procedure:
- Longitudinal incision @ posterior elbow
  - Slightly lateral or medial to olecranon process
- Distal triceps attachment can be detached or split longitudinally (if possible, retracted out of way to preserve muscle group)
- Ulnar nerve isolated and protected
- Posterior capsule incised and retracted
- Joint dislocated and humerus and ulna are resected to prepare for implant
- Implant cemented in place
- Capsule and ligaments may be repaired dependent on design used
Total Elbow Arthroplasty

Complications:
- More frequent than THA, TKA, TSA
- Categorized 3 ways:
  - Intraoperative
    - Fracture and malposition
  - Early post-operative (before 6 weeks) and late post-operative (after 6 weeks)
  - Infection
  - Wound healing
  - Triceps insufficiency (if detached)
  - Fracture and loosening of prosthesis
  - Ulnar neuropathy

Total Elbow Arthroplasty

Insert “total elbow arthroplasty” video here
Injury commonly involves anterior oblique band of ulnar collateral ligament.

Most common procedures done on the throwing athlete:

- **Indication:**
  - Failure of conservative measures in well-motivated athlete.

- **Procedure:**
  - Reattachment of UCL.
  - Osteophytes removed.
  - Ulnar nerve mobilized and transposed.
  - Graft used:
    - Typically ITB, palmaris longus tendon, plantaris tendon.

Post-immobilization is typically in posterior splint for 7-10 days at 90° flexion, neutral rotation (but dictated by physician).
UCL Reconstruction

- Insert “reconstruction of the medial collateral ligament using the hybrid technique” here

Bicep Tendon Repair
Bicep Tendon Repair

- Uses tendon graft, many times palmaris longus tendon
- Anterior incision
- Radial nerve protected
- Posterior interosseous nerve is decompressed to prevent compression post-surgery
- Bone anchors used

Bicep Tendon Repair

- Insert “Bicep tendon repair” video here