Osteochondritis Dissecans of the Elbow

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Osteochondritis Dissecans
• Idiopathic, localized disorder of subchondral bone
  – Separation & fragmentation of cartilage and bone
  – Limited capacity for healing
  – Progression to fragmentation
  – Loose body formation
  – Mechanical symptoms
• Typically affects young adolescent athlete

Etiology
• Need to differentiate 2 disorders of the immature capitellum:
  – Panner’s disease
  – Osteochondritis dissecans
• Age and prognosis are different
• Should be distinguished as separate but related entities along a spectrum of the same process

Overuse Injury in Youth Baseball
• Commonly affects dominant arm of Little League pitchers
• Repeated radiocapitellar compression on immature epiphysis
  – Subchondral flattening from fatigue fracture
  – Is it a stress fracture? AVN? or both?

Etiology
• Typically between 7 and 12 years of age
  – Peak age of 9 years
• Not associated with repetitive trauma
• Flattening and patchy sclerosis of the entire humeral capitellum on x-rays
• Conservative treatment
  – Capitellum reconstitutes with time
• No long-term sequelae

Panner’s Disease

Osteochondritis Dissecans
• Young adolescent athlete (Age 12-17)
• Highly repetitive activity
  – Baseball, Gymnastics, Racquet Sports, Football
• Elbow gain with activity
  – Most often lateral, but can be diffuse (overuse injury)
• Loss of motion
• Swelling
• Mechanical symptoms
  – Grinding, catching, clicking, locking

Poor Vascular Supply
• Immature capitellar epiphysis
  – Only has 1 or 2 vessels from posterior elbow
  – End vessels in isolation without metaphyseal collateral flow
  – Limited healing capacity of the epiphysis = osteonecrosis

Osteochondritis Dissecans
• Likely a combination of:
  – Injury from repetitive trauma
  – Tenuous blood supply to the humeral capitellum
• Genetic predisposition to OCD
  – Bilateral and multiple joint involvement

Physical Examination
• Tenderness over radiocapitellar joint
• Posterolateral crepitus with pronosupination
  – Catching, locking
• Lateral pain with moving valgus stress
• Mild loss of extension
  – Flexion, pronation, supination usually not affected
### Plain X-Ray
- X-ray is initial screening test
- But beware...
- Changes early in the disease process may not be obvious radiographically
- Views at 45 degrees flexion and contralateral elbow views are helpful

### X-Rays
- **Sensitivity**
  - Detection of OCD = 66%

### MRI
- MR helpful for assessing
  - Overlying articular cartilage
  - Stability of the fragment

### CT scan
- **CT or CT arthrogram**
  - Usually better than MRI in detecting loose bodies

### Classification Useful for Treatment
- 3 types of lesions:
  - Stable
    - Intact articular cartilage
  - Unstable but attached
    - Overlying articular cartilage is broken
  - Unstable and loose
    - Loose bodies

### Nonoperative Treatment
- In the absence of loose bodies or mechanical symptoms
  - First step in treatment = rest
- If symptoms persist, then surgery may be indicated
- 50% of patients heal with nonoperative treatment, which means 50% do not.

### Nonoperative Management
- Stable lesions (Takahara et al)
  - Nondisplaced
  - Open capitellar physes
  - Near normal ROM
- Elbow rest for 6 months, then repeat MRI
- Poor prognosis
  - Radiographic fragmentation
  - Closed physes
  - Motion loss > 20 deg

### Surgical Treatment
- Surgical procedure based on:
  - Size of the lesion
  - Integrity of the subchondral bone
- No role currently for reduction and fixation of long-standing, free loose bodies
- OCD in elbow is different from OCD in knees
- Exception in acute cases and very young?

### Surgical Management
- Removal of loose bodies
- Drilling of lesion
- Fragment fixation
- Microfracture
- Osteochondral autograft (OATS)
- Autologous chondrocyte implantation (ACI)
- Closing wedge osteotomy of lateral condyle

## Arthroscopic Elbow Microfracture for OCD

### Distal Ulnar Portal
- 2 wk f/u: Mild soreness
- 6 wk f/u: No pain, Full ROM.
- 3 mo f/u: Played on school’s basketball team
- 6 mo f/u: Back to throwing and playing Short Stop

### 12 Year Old Pitcher
- 2 wk f/u: Mild soreness
- 6 wk f/u: No pain, Full ROM.
- 3 mo f/u: Played on school’s basketball team
- 6 mo f/u: Back to throwing and playing Short Stop
Overview of Surgical Treatment

- Subchondral drilling and microfracture
  - Can only resurface defects
  - Cannot reconstitute subchondral bone
- Autologous chondrocyte implantation (ACI)
  - Limited ability to address subchondral bone loss
  - Sandwich technique used in knee has not been tried in elbow
- Osteochondral autograft transplantation (OATS)
  - Can restore subchondral bone
  - Donor site morbidity

Osteochondral Autograft Transfer (OATS)
from Knee to Elbow

15 Year Old Gymnast

- 6 wk f/u: No elbow or knee pain. Full elbow and knee ROM. No effusion in elbow or knee.
- 6 mo f/u: Returned to cheerleading and gymnastics. No symptoms with running.

Review of Literature

- Interpreting the literature is difficult
- Studies often do not distinguish between “Very early” vs. “Early” vs. “Late” OCD
- No universally accepted classification exists
- Not all studies include MR imaging findings
- Surgical techniques are constantly evolving (OATS)

Results of Surgical Treatment

- Almost universal after surgery using any technique
  - Improved pain
  - Improved range of motion
  - Improved mechanical symptoms
  - in the short-term and mid-term... But...
- Bauer et al showed that about 50% of patients were symptomatic at 23 years

Summary

- Elbow pain in the at-risk athlete should raise suspicion for OCD
  - Baseball player
  - Gymnast
- When obvious radiographic changes are present, long-term studies of debridement/microfracture suggest 50% will be symptomatic as adults
  - OATS may perhaps offer better results long-term
- Key to successful treatment is early detection

Primary Repair in Acute Cases or Very Young

Thank You

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