Osteochondritis Dissecans

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Disclosures

- Arthrex- course instructor

Introduction

- Osteochondritis Dissecans
  - Local avascular process of subchondral bone
  - Secondarily effects on cartilage
  - Variable clinical patterns
- Two types
  - Juvenile
    - Open physes
    - Usually occurs at age 10-15
    - Boys more common than girls
  - Adult

Location

Knee:
- MFC
  - 65-70%
- LFC
  - 15-30%
  - Discoid meniscus (10-90%)
- Trochlea
  - 2%
- Patella
  - 1.5-5%
- Tibial pleateau
  - 0.2-0.5%

Elbow
- Capitellum of humerus in dominant extremity

Ankle
- Talus

Natural course

- Subchondral edema
- Bony softening with intact articular surface
- Fragmentation/ Early articular separation
- Secondary cartilage fissuring/ Partial detachment
- Destabilization with osteochondral separation with loose bodies

Pathophysiology

- Multifactorial
  - Traumatic
    - Overuse
    - Repetitive microtrauma
    - Risk factors: Gymnasts and throwers
  - Vascular (adult form thought to be vascular)
    - Hemoglobinopathies, etc.
  - Genetic/Hereditary
    - LCP, MED, Stickler's, tibia vara, dwarfism
  - Developmental
    - Accessory bony islets in epiphysis
  - Metabolic
    - Vitamin D deficiency??
- Theorized to result from repetitive compression-type injury of the immature capitellum causing vascular insufficiency and repetitive microtrauma

Prognosis

- Juvenile lesions
  - 85-100% heal
  - Good functional outcomes
  - Prognosis correlates with
    - Age
      - Younger age
      - Open distal femoral physes are best predictor of successful non-operative management
    - Location
      - Lesions in the lateral femoral condyle and patella have poorer prognosis
    - Appearance
      - Sclerosis on xrays correlates with poor prognosis
      - Synovial fluid behind lesion on MRI correlates with a worse prognosis
- Adult lesions
  - Up to 15% re-operation rate
  - Satisfaction 70-85%
  - Usually leads to DJD if untreated

Presentation

- Symptoms
  - Pain
    - Activity related pain that is vague and poorly localized
  - Mechanical symptoms
    - Indicates advanced disease
  - Recurrent effusions of the knee
  - Elbow: loss of extension is an early sign. Catching, locking, grinding are late signs
- Physical exam
  - Localized tenderness
  - Stiffness (loss of extension)
  - Swelling
  - Wilson's test
    - Pain with internally rotating the tibia during extension of the knee between 90 and 30 degrees, then relieving the pain with tibial external rotation

Imaging

- Radiographs
  - Recommended views
    - Knee:
      - Weight-bearing anteroposterior (AP), lateral radiographs
      - Obtain tunnel (notch) view
        - »Knee bent between 30 and 50 degrees (PA)
    - Elbow:
      - AP and lateral of elbow
- MRI
  - Useful for characterizing
    - Size of lesion
    - Status of subchondral bone and cartilage
    - Signal intensity surrounding lesion
    - Presence of loose bodies

Treatment

- Nonoperative
  - Restricted weight bearing and bracing
    - Indications
      - Stable lesions in children with open physes
      - Asymptomatic lesions in adults
    - Outcomes
      - 50-75% will heal without fragmentation in the knee
      - >90% success rate in elbow
- Operative
  - Diagnostic arthroscopy
    - Indications
      - Impending physeal closure
      - Clinical signs of instability
      - Expanding lesions on plain films
      - Failed non-operative management

Treatment algorithm

- Intact cartilage
- Fissured, stable
- Fissured, unstable
  - Healthy vs unhealthy cartilage
  - Loose body

Treatment for intact cartilage

- Transarticular/ retrograde
- Retroarticular/antegrade
- Supplemental fixation
  - "trampoline effect"

Arthroscopic drilling

- Smooth 0.45 K-wire
- Create vascular channels
  - Marrow stimulation
  - Hard/soft/hard feel
  - Drill 1-2 cm deep
- Outcomes
  - Leads to formation of fibrocartilagenous tissue
  - Improved outcomes in skeletally immature patients

Arthroscopic Drilling

- Extra-articular drilling
  - Option for intact cartilage
- Need fluoroscopy
- Takes time
- Learning curve
- Valid option

Fissured but stable

- Break in cartilage but does not hinge open
- Supplemental stabilization/ compression is needed
- Drilling can be in addition
- Outcomes
  - 85% healing rates in juvenile OCD

Arthroscopic fixation

- Absorbable implants
  - Darts/nails
  - Compression screws
- Non-absorbable
  - Metal screws
- Biologic
  - OC plugs
  - Bone pegs

Fissured and unstable lesions/ loose bodies

- Hinged lesions
  - Arthrotomy
  - Curette base
  - Possible bone grafting
  - Fixation
  - Resurface if cartilage unhealthy
- Loose bodies
  - Attempt fixation
  - Excise and resurface

Structural resurfacing

- Osteochondral allograft

Structural resurfacing

- OATS

Non-structural resurfacing

- Microfracture

Non-structural resurfacing

- ACI

Nonstructural resurfacing

- Biocartilage, Denovo

Post-op management

- Resurfacing
  - Impact activities at 4-6 months
  - Longer for ACI

Rehab

- Non-resurfacing
  - TTWB vs PWB for 6 weeks
  - RTS 3-6 months
  - X-ray at 6 weeks, 3 months and 6 months
  - MRI at 3 months and possible 6 months