Knee Osteochondritis Dissecans (OCD) in the Pediatric and Adolescent Patient

Michael Saper, DO, ATC, CSCS
Assistant Professor, Orthopedics and Sports Medicine
Anatomy

- Cartilage covers the joint surface at end of a bone.
- When healthy, allows:
  - Range of motion
  - Shock absorption
- Poor healing ability
What is OCD?

- **Injury to the bone** below the cartilage
  - Due to loss of blood supply from repetitive trauma
- Risk for instability and disruption of overlying cartilage
- May result in early arthritis
- Both knees in 25%

Can be a 3-4 procedure problem
Treatment depends on:

- Stability of OCD lesion
- Fragment salvageable?
- Location
- Size
- Amount of bone involvement
Cue Ball, Shadow

Arthroscopic Evaluation

Stable, Salvageable Progeny
Cue Ball Shadow

Immobile
Osteochondritis Dissecans – Locked Door

Arthroscopic Evaluation

Stable, Salvageable Progeny
Locked Door mobile

Seattle Children's
UW Medicine
Unstable, Salvageable progeny: Trap Door
Crater with congruent flap
Crater with incongruent loose flap
That can be made congruent

Juvenile OCD

mobile
Crater

Unstable, Salvageable progeny:
- Trap Door
  - Crater with congruent flap
  - Crater with incongruent loose body
- Juvencile OCD

Juvenile OCD

Unstable, Salvageable progeny
- Crater with incongruent loose body that can not be made congruent
- Crater with fragmented loose body
- Crater without loose body

Images of craters and related medical illustrations are also present.
Operative Treatment Options – Stable/Immobile Lesions

- Subchondral Bone Drilling
  - ~1mm wire
  - Drill into bone to stimulate healing
  - ~85-90% healing at 4.5-5.5 months
Operative Treatment Options – Unstable Lesions

• Fixation (open or arthroscopic)
  • Salvageable cartilage
  • Metal vs Bioabsorbable
  • Biologic
  • + Drilling

• Salvage
  • Chondroplasty/Microfracture (drilling)/abrasion arthroplasty
  • OATS
  • OCA
  • ACI
  • + Bone grafting
Salvageable Unstable Lesions - Fixation

- No difference in outcomes
- Bioabsorbable implants (chondral dart, smart nail, biocompression screw)
  - No need to remove
  - ? Cyst formation (with older technology)
- Metal screws
  - May need removal 6-8 weeks (time varies depending on screw choice)
Arthroscopic Fixation with BioCompression Screws (Preferred Technique)
Unsalvageable Lesions - Marrow Stimulation

- **Small** lesions (< 1-2 cm)
- **Contained** (cartilage walls all around)
- Minimal bone loss
- Drill holes in the bone
- Forms a cartilage plug
Marrow Stimulation *Plus* Biocartilage

- Allograft cartilage
- Add PRP
- Scaffold
- Improves fill of defect
- Increased Type II collagen
- No outcome data
Unsalvageable Lesions – Osteochondral Allograft

- Osteochondral Allograft
  - Replaces bone and cartilage
  - 88% good-excellent results at 10 years in adolescents
  - Staged procedure?
Operative Treatment Options – Unstable Lesions

- Bone grafting
- If significant bone loss or cystic changes at base of lesion
- Cancellous chips, DBM, autogenous local grafting (proximal tibia, distal femur)
Rehabilitation and Return to Sports

• Weight-bearing depends on procedure
  • From NWB to TTWB

• Encourage range-of-motion exercises
  • Goal = full ROM by 6 weeks

• Increased loadbearing exercises at 3 months

• Return to sport at 6-9 months depending on sport
Conclusions

• Goals = remove diseased tissue, fill the defect, return to sports
• Surgery generally results in improved elbow range-of-motion and outcomes
• Low rate of complications
• Slow, progressive rehabilitation is key
• Return to sports (6-9 months)

Contact:
@DrMichaelSaper