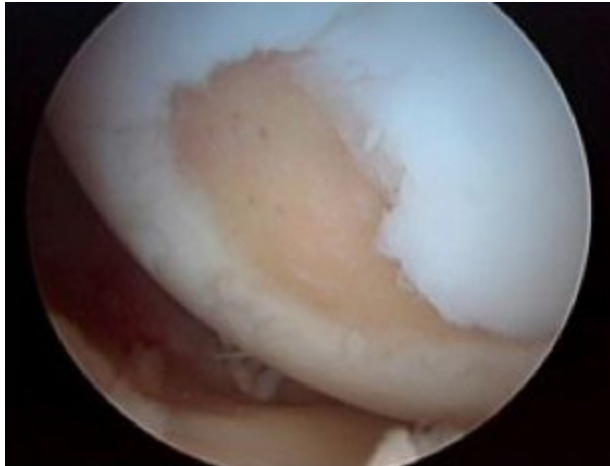


Cartilage Restoration w/ Dr. Nuelle



18 y/o football player comes in w/ 4 month history of generalized knee pain-

Treatment of OCD Lesions/ Cartilage Restoration

Etiology-

- Common in adolescents/young patients
- Multifactorial
- Elbow: Repetitive microtrauma secondary to valgus + axial loading of elbow (gymnasts/baseball)
- Ankle: Trauma

History

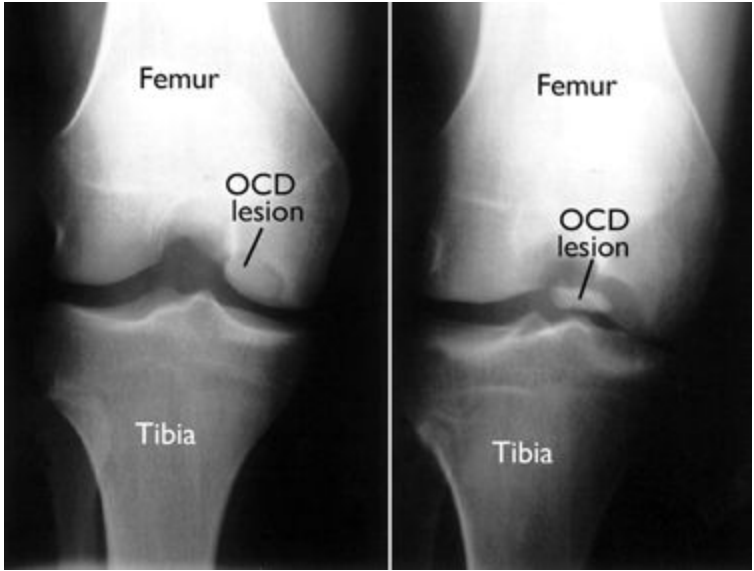
- Pain, swelling
- Crepitus, catching & locking in later stages

PE

- TTP, Decreased ROM (elbow/knee) +/- effusion
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Imaging-

- Xray: Well circumscribed area of subchondral bone separated by crescent shaped sclerotic and radiolucent outline of fragment. Fragmentation
- Xray
 - Knee: MC- posterior lateral aspect of medial femoral condyle
 - Elbow: MC- anterolateral aspect of capitellum
 - Ankle: Medial talus





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- MRI

Stable v Unstable :

- Stable: Open physes, normal ROM, localized flattening
- Not-stable: Closed physes, fragmentation (displaced or nondisplaced), Restricted ROM (Elbow)



Non-op tx:

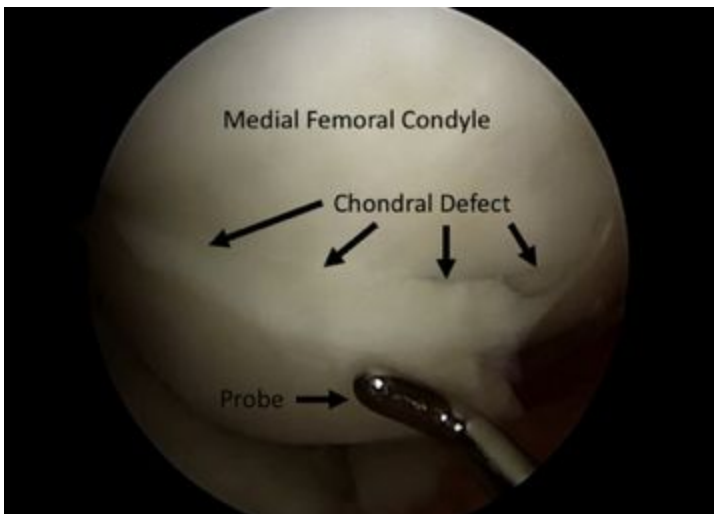
- Asymptomatic patients, clinically improving patients
- Stable lesions:
 - Elbow: Rest, NSAIDs, Braces, PT
 - Knee/Ankle : Rest, PWB w/ Crutches, NSAIDs, PT
- Repeat MRI after 12 weeks?

Operative tx indications

- Stable lesions who failed non-op tx
- Unstable lesions
- Large osteochondral defects

Arthroscopic Debridement/Chondroplasty

- Debride loose cartilage flaps, may help w/ knee mechanical sx



Fragment fixation

- Unstable lesions >2cm
- Trapdoor lesions- debride fibrous base of lesion
- Fix w/ metallic implants or bioabsorbable device
 - Bioabsorbable - made from poly glycolic acid or polylactic acid.
 - PGA- absorbs in 3 mo. PLA- absorbs in 6yrs

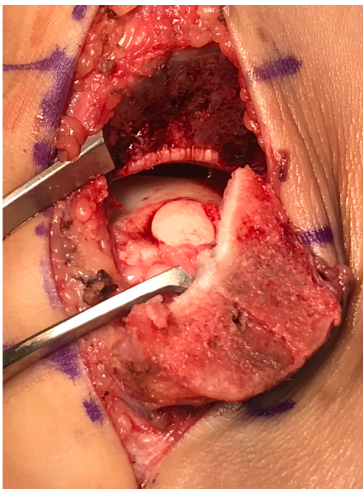
Marrow Stimulation Techniques:

Arthroscopic Microfracture or Drilling

- Retroarticular under flouro v transarticular
- Perforating subchondral plate at area of chondral defect. > blood clot w/ growth factors and progenitor cells from bone marrow that stimulates healing with FIBROCARILAGE

Osteochondral Autograft (1cm defect)

- Live chondrocytes + bone
- Indications- failed debridement and microfracture, and larger lesion size
- Used for lateral capitellum defects
- There is an extended recovery time and potential donor site morbidity.
 - Donor site morbidity- worse in patients w/ high BMI, older than 40 as well
- Another limitation- technique doesn't provide a matched fit, as knee contour different than talus



Osteochondral Allograft.

- Replace cartilage w/ live chondrocytes + bone
- Allografts are hypothermically stored for 14 days, chondrocytes decrease after 28 days (viability).
- Can use CT to template size of donor graft needed, can be useful w/ large bone defects
- Less donor site morbidity

- Limitations: cost, limited availability, possibly lower healing rates, immunologic reaction, limited availability

Autologous chondrocyte implantation (ACI)

- 2 stage procedure
- 1st- biopsy of viable chondrocytes - from femoral intercondylar notch or prox tibia
- Cells from biopsy are cultured over 2-6 weeks then implanted into the lesion during the 2nd procedure. Periosteal graft can cover chondral lesion
- Indicated for full-thickness, large >1cm contained defects
- Has been shown to result in growth of regenerative tissue w/ biomechanics properties close to normal hyaline cartilage

Autologous Matrix induced chondrogenesis

- Micro fracture of lesion followed by implantation of collagen matrix
- Advantage- one requires a single procedure and can be performed arthroscopically

Particulated cartilage products

- DeNovo- cartilaginous tissue graft from allograft under 13 y/o
- Cause of young age, cellular density is higher than in mature articular cartilage samples
- After debridement arthroscopically, the OCL. Graft particles are placed to cover the OLT w/ layers of fibrin glue below and above the graft and allowed to dry prior to scope portal closure.



Matrix associated stem cell transplant (MAST)

- Stem cell transplant w/ bone marrow aspirate concentrate