Osteotomies and Articular Cartilage Lesions: Indications in 2016
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Financial Disclosures

What are the deformities Knee Osteotomies are treating?

- Genu Valgum
- Genu Varum
- Chronic Patella Subluxation
- Axial Malalignment (femoral anteversion; tibial torsion)
Why / When an Osteotomy?

- To optimize the biomechanical environment
- In some cases, osteotomy may be all that is needed, e.g.,
  - Distal lateral patellar chondrosis does well with AMZ alone
  - Medial meniscal deficient does well with HTO alone HTO
  - Isolated DFVO may alleviate lateral "arthritic" pain in the middle aged patient

Coordinate with Chondrosis Mapping

Pidoriano & Fulkerson Classification 1997

- Inferior Pole and Lateral facet: 87% G/E
- Medial facet: 55% G/E
- Proximal Pole and Diffuse: 20% G/E
- Concomitant Central Trochlear Involvement: All Poor

Coordinate with Chondrosis Mapping
Why / When an Osteotomy?

- To optimize the biomechanical environment
- In some cases, osteotomy may be all that is needed, e.g.,
  - Distal lateral patellar chondrosis does well with AMZ alone
- In some cases, osteotomy may be a first stage in cartilage restoration
  - Scope staging for future intraarticular restorative surgery
  - End of career athletes: osteotomy allows RTS with delayed restoration

Valgus Malalignment

- Varus producing osteotomy to correct to neutral (normal alignment has 65% of body weight through medial compartment)
- Most often at distal femur (up to 10° may use tibial lateral opening wedge—tibia unloads full FROM; femur maximally at extension)
- Usually consider for alignment over 3-5 degrees of mechanical axis valgus depending on position and extent of chondrosis

Varus Malalignment

- Valgus producing osteotomy to correct to neutral or more (with cartilage restoration, less correction than for treating arthritis)
- Maximal reward is between 3°-5° of over-correction
- Most often now opening wedge as allows easier intraoperative fine tuning of the correct AND less surgical deformity of proximal tibial (greater ease of TKA conversion in the future)
Chronic Patellar Subluxation

- Anteromedial tuberosity osteotomy
- Medialization to normalize position of patella relative to the trochlea, which increases contact area
- Anteriorization to decrease PF peak loading forces
- Combined: Decreased forces/increased area = less stress to the osteochondral unit

FEA Patient-Specific Models for TTO:
AMZ 20% mean decrease in stress—BUT Variable

Medialization with Anterization

Cohen et al AJSM 2003
Axial malalignment

- Clinical exam in prone position to measure hip/femoral rotation and foot progression angle
- If questionable, obtain hip to knee to ankle rotational study
- Correct at site of deformity

Excessive Femoral Anteversion

Derotation of Femur
Conclusions

- Optimize the environment for the cartilage restoration
- Plan staging
- Don’t burn bridges
- Plan for future revision surgery

Thank You