



Knee Arthritis Podcast Notes w/ Dr. Sherman

History

- Hip pain
- Mechanical symptoms
- ACL injury/ insufficiency
- Previous treatments
- Previous surgery
- Functional status (ADLs, sports, walking tolerance)
- Expectations (work v sports v high impact activities)

PE:

- Inspection: varus/valgus , trendelenburg gait, full squat +/- duck walk
- Palpation,
- ROM- tracking during ROM
- Special tests (lachman, etc)

Imaging

- Weight Bearing AP, rosenberg
 - Posteromedial wear in ACL deficient knee
- Standing hip-ankle
 - Define mechanical axis
- Sagittal plane alignment
 - measure posterior tibial slope
- MRI?

Treatment options

Non-op

- Activity modification, weight loss, low impact exercise, analgesic medications (tramadol), NSAIDs
- Bracing- offloader brace
 - possibly useful in pts symptomatic unicompartmental OA w/ correctable deformity & an average size leg
- PT- quad strengthening
- Steroids (short term relief), viscosupplementation, PRP (little evidence), stem cells (little evidence)

Operative

- Arthroscopy - for pain- not recommended
 - Useful if there are mechanical sx

Osteotomy

- Principle- redistribute weight bearing forces from the worn to unworn compartment of knee
- Indications: malalignment +
 - Arthrosis
 - Instability
 - Arthrosis + instability
 - Meniscus/cartilage transplant + instability
- Use in higher demand, younger/ middle age patients
- Varus deformity more common than valgus

Medial compartment OA

- Medial HTO
 - Pros-technically easier, correction in coronal + sagittal planes
 - Cons- delayed/nonunion. Difficult to maintain tibial slope
 - Corrections <8mm- graft may not be needed
 - Iliac crest bone autograft to fill defect?
 - Locking plates
- Lateral closing wedge HTO
 - Pros- healing in compression- fewer union problems, favorable alteration in slope to treat ACL insufficiency
 - Cons- technically difficult, peroneal nerve, decreases bone stock, makes TKA more challenging

Lateral compartment OA

- Proximal tibia osteotomy (medial closing/ lateral opening)
 - Not as good as results as valgus osteotomies
 - Concern of MCL laxity/ joint line obliquity
 - Useful for small corrections of 12 degrees or less
 - If deformity is in femur- or correction greater than 12 degrees, distal femur osteotomy
- Distal femur varus osteotomy
 - Useful w/ femur valgus: ex: hypoplastic lateral femoral condyle, or if required correction is >12 degrees
 - Medial closing wedge
 - Typically results in tibiofemoral angle correction of 0 degrees and mechanical axis correction of 6 degrees varus
 - Lateral opening wedge
 - Advantage, correction can be tailored to desired varus

Sagittal plane deformity

- Posterior slope typically 10 degrees +/-3
- Too much slope- anterior tibia translation
- Anterior closing/opening wedge osteotomy for slope

Instability + pain

- ACL deficiency + varus knee
- Options: lateral closing wedge or combined HTO and ACL recon.
- Medial opening wedge- changes slope in unfavorable direction
- Combined procedure
- Simultaneous or staged?

Pre-op planning

- Varus HTO
 - Rationale: 62-66% weight bearing line tibial intersection- approximates a 3-5degree valgus mechanical axis
 - If transferred to lateral 75% coordinate> this leads to medial femoral condyle lift off and unicondylar weight bearing (not desirable)
 - Need to select a correction wedge angle that is equal to amount of angular deformity + add it to overcorrection desired
 - Factors to consider: lateral joint opening- inc varus angulation
- How to plan osteotomy
 - Line of mechanical axis
 - Select coordinate on tibia plateau
 - Angle between mechanical axis/coordinate- amount of angular correction required
 - Line on metadiaphysis > towards fibular head
 - Line over line from center of ankle to correction point
 - Measure distance between angle = desired osteotomy correction length
- Operative pearls?
 - K- wires aiming towards fibular head
 - Unicortical cut only
 - Osteotomy Should match tibia slope
 - Plate selection? Locking?

Post op protocol?

- NWB for short period of time, 2 weeks?
- Postpones TKA need
- High patient satisfaction

Sources:

[Hui et al. Knee arthritis, DeLee, Drez, & Miller's Orthopaedic Sports Medicine, 104, 1277-1292.e4](#)

Dugdale, T. W., Noyes, F. R., & Styer, D. A. V. I. D. (1992). Preoperative planning for high tibial osteotomy. The effect of lateral tibiofemoral separation and tibiofemoral length. *Clinical orthopaedics and related research*, (274), 248-264.