Diagnosis & Nonoperative Treatment of the Osteoarthritic Knee

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“There are 2 things a good doctor does”

• First Step:
  • Finds out what's wrong

• Second step
  • Makes the patient feel better
A Case Of A Painful Knee
60 year old male with unilateral medial knee pain

• This is most likely OA.

• But how do we establish the diagnosis?
History

• Mild twisting injury working at home in his yard 2 months ago
  • Chronic vs acute

• Pain is on the medial side of the knee. There is moderate diffuse swelling but no warmth, redness, or fever.
  • Soft tissue injury?
  • Infection unlikely
  • Should we consider arthrocentesis?

• There is no catching, locking or giving way
  • Mechanical symptoms suggest diagnoses like meniscal tear
    • MRI? – note that we won’t be discussing MRI anywhere else!
    • Orthopedic referral?
History

• One previous episode of knee pain 18 months ago. Resolved with OTC medication
  • Recurrent - flare-up?

• No previous surgery on this knee

• No other joints hurt or swell
  • Inflammatory arthritis or rheumatoid arthritis most often polyarticular
Medical History

- HTN – Losartan/HCTZ
- Mild GERD – PPI PRN
- No cardiac meds
- No renal or liver disease
- NKDA

- NSAID risk is moderate
- Acetaminophen should be ok
Social History

• Works as an auto mechanic
  • Physical job – discuss as part of plan

• Wants to bike and jog
  • Understand activity goals and need to modify
Physical Exam

• Afebrile
  • Systemic symptoms are a late finding in peri-articular or joint infection

• BMI = 40
  • Need to discuss optimization of body weight

• Gait – antalgic

• Reduced quad muscle size and poor tone
  • Fall risk?
  • Needs an exercise program
Knee Exam

• Moderate effusion
  • Arthrocentesis criteria
    • Tense and painful
    • Significant quad inhibition
    • Diagnostic – infection, hemarthrosis, RA/IA

• ROM nearly full. Pain at extremes
Knee exam

• Tenderness medially including medial femoral condyle, joint line and medial tibial plateau
  • MCL, meniscus injury?

• No pain with valgus stress. Rest of ligament exam WNL
  • MCL injury painful with valgus
  • Detailed ligament requires experience

• Patellar exam – mild peri-patellar tenderness and crepitus
Physical exam

• Standing alignment – mild but obvious varus. Increased on affected side
  • Fracture/bony deformity?
  • Joint space narrowing?
  • Brace candidate?

• Hip ROM full and pain-free. Lumbar spine is stiff but SLR is negative
  • Hip OA and sciatica are 2 conditions that can cause pain referred to the knee
X-rays

• To confirm the diagnosis, **must** have X-rays
  • Order the optimal series – always weight-bearing
  • Prefer:
    • AP in slight flexion
    • Lateral
    • Tangential patella (Merchant view, e.g.)
Typical X-ray findings in OA

• Joint space narrowing
• Peripheral osteophytes
• Subchondral sclerosis
• Single or multiple compartments (medial, lateral, patellofemoral)
X-ray results

• Mild medial joint space narrowing
  • Not “bone on bone”
• Small medial peripheral osteophytes
• Mild subchondral sclerosis
• No significant abnormalities lateral or PF
• No fractures, bony deformity, or other joint or soft tissue abnormality
Arthrocentesis

• Obtained 30cc clear, yellow fluid
  • No hemarthrosis
  • Unlikely infectious – C & S
• Unlikely IA/RA
  • Crystal analysis
  • Cell count
Blood tests

• None performed – minimal suspicion
  • Consider ESR, CRP, ANA, anti-CCP, RhF when appropriate based on H&P
  • Rheumatology referral
Diagnosis - Mild to moderate medial compartment osteoarthritis

Additional scans?
Nonoperative treatment - goals

• Optimize Nonoperative treatment
• Optimize Quality of Life
• Minimize risk
• Monitor appropriately
Nonoperative treatment – general aspects of the treatment plan

• Includes a combination of modalities including pharmacological (oral, topical, injectable) and non-pharmacological (lifestyle modifying, bracing, or complementary/alternative)

• Progresses in a stepwise fashion if the patient does not respond and symptoms persist
Treatment Guidelines

• Many medical organizations have published guidelines that are very similar in the big picture
• But, vary substantially in the details
• Our discussion today is based on a synthesis of the literature, the guidelines, and experience
• Won’t discuss PRP and MSC in OA treatment – too new, not enough known at this time
Current Reality
Initial treatment plan

1. Education
   • Arthritis is:
     • Progressive
     • Incurable
     • And is in large part treated symptomatically

2. Lifestyle/Activity Modification
   • Low impact – no running
   • Discuss job options
Initial treatment plan

3. Optimize weight – lower BMI
   • Dietician consultation
   • This is difficult – don’t make patient feel successful treatment hinges on this

4. Exercise
   • Titrate by comfort. Post exercise swelling and pain means too strenuous
   • Goals
     1. Strength – quads are the shock absorbers of the knee
     2. Help with weight management
     3. Balance – mitigates fall risk
     4. Range of motion
How to achieve exercise goals

• Self/Home exercise
  • Huge compliance issue unless habitual exerciser

• Physical therapy
  • The habitual exerciser may benefit from 2 or 3 sessions for instruction in a home/gym program
  • Most patients, BIW x 6 weeks
    • Land – conventional PT
    • Aqua – good for highly symptomatic, obese or limited mobility
      • Barriers – acceptance, availability
Initial treatment plan

5. Acetaminophen
   • No more than 4 grams daily
   • Caution in any patient with renal impairment

6. Glucosamine/Chondroitin
   • Research studies and meta-analyses mixed but overall the combination appears better than placebo
   • Disease modifying?
     • Structural effects on articular cartilage
Nonpharmacological/Complementary options to consider at treatment onset or later

- Knee sleeve
- Patellar taping
- Wedge insoles
- Acupuncture
- TENS

- Not a lot of research support or positive guideline recommendations!
After 6 weeks of treatment, the patient reports essentially no change in his symptoms
Next step - NSAIDs

• Oral
  • Low dose, short course
  • Use with PPI?
  • Naproxen safer?
• Response variable – try two from different classes
• Disadvantages – Renal/BP/GI/Cardiac
Next step - NSAIDs

• Topical
  • Consider in older patients and those with higher medication risk
  • Diclofenac, e.g.
  • Lidocaine patches

• Role of opioids – discussed, but not for me in current climate
The patient tried Naproxen and Etodolac for 3 weeks each. He continued to exercise regularly, but still experienced no substantial relief
Next steps

• Viscosupplementation
  • Varying recommendations
  • Mechanism of action
    • Lubrication
    • Analgesic
    • Anti-inflammatory – PGE2
    • Modification of HA synthesis
  • Excellent safety profile
  • Injection technique important – must be intra-articular
  • NOT for severe OA
My preference

• Bio-engineered – no avian contaminants
• Long chain, high molecular weight – closer to native hyaluronan
• Orthovisc, Euflexxa
• Synvisc – higher rate of local reaction compared to other products
Bracing

• Unloader
  • Good research studies
  • Optimal candidate: developed musculature, small soft tissue envelope, males - better aesthetic acceptance
  • Work best with active job or for recreation

• Sleeves – modest benefit and not a covered service
The patient did a lot of yardwork and pain and swelling have increased substantially. He and his family have a vacation coming up where they will do a lot of walking.
Intra-articular corticosteroid injection

• Great choice for a flare-up and when short-term relief is important
• Acts quickly
• Duration of effect 4 weeks or less
• Low risk – mild systemic effect - blood sugar, e.g.
• Contraindication – infection
• Anecdotal reports and animal models suggest “joint damage” with multiple injections BUT all guidelines recommend and 95% of rheumatologists use them
The patient responds to the injection and has a great vacation, but after several weeks his pain returns to previous level and he is dissatisfied
The obvious next step:

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