DEGENERATIVE JOINT DISEASE

OSTEOARTHRITIS OF THE KNEE

CASE:
A 66-year-old woman who is overweight reports bilateral knee pain of gradual onset during the past several months that increasingly has limited her activities. Last week, when walking down the stairs, she nearly fell when her knee gave way. She does not recall having injured her knee, and she has no morning stiffness and no pain in other joints. She has tried taking up to eight extra-strength (500 mg each) acetaminophen tablets daily without success and has never had ulcers or stomach bleeding.

DIFFERENTIAL DIAGNOSIS
Trauma: ligamentous sprains
Meniscal injury
Osteoarthritis
Patellofemoral pain syndrome
Pes anserine bursitis
Inflammatory: rheumatoid arthritis, Reiter syndrome
Septic arthritis
Midlumbar radiculopathy
Crystal-induced inflammatory arthropathy: gout, pseudogout
Popliteal cyst
Tumor

WHY ME?
Risk Factors:
• Obesity
• Age > 55 yrs
• Female
• Prior injury/Sports Activities (wrestling, cycling, recreational parachuting, soccer, football)
• Muscle weakness
• Skeletal asymmetry/malalignment (valgus or varus deformities)

WHY ME?
• Joint pain (medial > lateral) associated with activity (climbing stairs, walking distances, going from seated to standing position)
• Decreased range of motion
• Morning stiffness that lasts < 30 minutes
• Weakness or instability
• Crepitus
• Effusion

THE KNEE EXAM

Inspection: gait, varus or valgus alignment, swelling, erythema
Palpation: joint line tenderness, swelling, warmth, crepitus
Specific Testing:
Lachman’s:
http://www.youtube.com/watch?v=htJiomxxJ7Q&feature=fvw rel
McMurry’s:
http://www.youtube.com/watch?v=xuKvQ_6C3U_o&feature=rel
Anterior and Posterior Drawer tests, Valgus and Varus Stress tests, patellar apprehension test.
PATHOPHYSIOLOGY

Two theories of how OA starts:
1. Injury to cartilage, either single event or repetitive microtrauma, that initiates inappropriate repair response.
2. Fundamental defect in cartilage – example type II collagen gene defect.

Injury > activation of protease, collagenase, and cytokines > cartilage degradation.
- Hyaline articular cartilage is lost > Joint space narrowing.
- Capsular stretching
- Bone remodeling (subchondral bone cysts and osteophytes)
- Synovitis is present in some cases.
- Ligamentous laxity also occurs.
- Malalignment of joint
- Weakness of periarticular muscles

PHYSIOLOGIC CHANGES

DIAGNOSIS

CRITERIA FOR OA OF THE KNEE:
- Presence of knee pain, plus at least 3 of 6 characteristics
  - Greater than 50 years of age
  - Morning stiffness for < 30 minutes
  - Crepitus on active ROM of knee
  - Boney Tenderness
  - Boney Enlargement
  - No palpable warmth

Sensitivity 95% and Specificity 69%
*American College of Rheumatology

CRITERIA EXPANDED:
- ESR< 40
- Rheumatoid Factor Titer < 1:40
- Synovial Fluid consistent with OA: clear color, WBC < 2000
  Sens 92% and spec 75%

Imaging: Indicated if pain is nocturnal or is at rest or doesn’t improve with conventional therapy.
Findings do not correlate well with symptoms of OA.
NONPHARM TX

- ACR Strongly Recommends
  - Participate in aerobic and/or resistance land-based exercise
  - Participate in aquatic exercise
  - Lose weight (for persons who are overweight)

NONPHARM TX

- ACR Conditionally Recommends
  - Participate in self-management programs
  - Receive manual therapy in combination with supervised exercise
  - Receive psychosocial interventions
  - Use medially directed patellar taping
  - Wear medially wedged insoles if they have lateral compartment OA
  - Wear laterally wedged subtalar strapped insoles if they have medial compartment OA
  - Be instructed in the use of thermal agents
  - Receive walking aids, as needed
  - Participate in tai chi programs
  - Be treated with traditional Chinese acupuncture
  - Be instructed in the use of transcutaneous electrical stimulation

WEIGHT LOSS

Strong associations
- Framingham: men 1.5, women 2.1
ADAPT study
- N=316 over 18 mths
- Healthy lifestyle vs Diet, Exercise, D+E
- Aerobic + Resistance Exercise 1 hr, 3x/wk
- Diet – 4.9%, D+E 5.7%, Cont 1.2%
- 5.7%=11.5 lbs

EXERCISE AND DIETARY WEIGHT LOSS IN OVERWEIGHT AND OBESE OLDER ADULTS WITH KNEE OSTEOARTHRITIS: THE ARTHRITIS, DIET, AND ACTIVITY PROMOTION TRIAL

Arthritis & Rheumatism
Volume 50, Issue 5, pages 1501-1510, 6 MAY 2004 DOI: 10.1002/art.20256
http://onlinelibrary.wiley.com/doi/10.1002/art.20256/full#fig2

EXERCISE

2006 meta-analysis
- 16 studies
- Modest, yet clinically important influence on wellbeing

2009 meta-analysis
- 32 studies
- Land-based exercise has short-term benefits

EXERCISE

Weakness of quadriceps muscle
- Improve stability of joints
- Improve pain
- High/low intensity aerobic
- Water vs Land
- Tai Chi
MALALIGNMENT

Medial knee more common

- Genu varum
- Unloader brace
- Neoprene sleeve

1999 study

$350 vs $30

Mean aggregate absolute scores for pain on the thirty-second stair-climbing test.

Mean aggregate absolute scores on the WOMAC

Wedged insoles

- Thicker laterally
- Decreases medial load

RCT showed no reduction in pain

PHARM PHRIENDLY

PHARM TX

ACR strongly recommends

- Acetaminophen
- Oral NSAIDs
- Topical NSAIDs
- Tramadol
- Intraarticular corticosteroid injections

ACR conditionally recommends NOT to use

- Chondroitin sulfate
- Glucosamine
- Topical capsaicin

ACR has NO recommendations

- Intraarticular hyaluronates
- Duloxetine
- Opioid analgesics
NSAIDS VS ACETAMINOPHEN

2009 Cochrane meta-analysis, 15 RCTs
- 4000 mg Tyl vs various NSAIDs
- TYLENOL better than placebo... barely
- NSAIDs better than TYLENOL... barely
- GI adverse effects: NSAID 19%, Tyl 13%
- Withdrawal due to GI: RR 2.0
- GI AE: RR 1.47
- COX2 no GI probs
- No difference in serious GI, renal, CV AEs
  - But mean study length was 6.6 weeks

ACETAMINOPHEN GI EFFECTS

2011, 13 week study
- 3 g Tyl vs 1200 mg Ibuprofen, mono and combo
- Similar drop in HGB at end
- Worse in combination

UTD: 22 g/day

GUIDELINES ANYONE?

American College of Rheumatology
- Mild OA: Tyl > NSAIDs
- Mod/Sev OA: consider NSAIDs

European League Against Rheumatism
- Tyl primary. NSAIDs for Tyl failure

Canadian Consensus Guidelines
- Mod/Sev: NSAIDs
- Mild: may consider Tyl

No NSAID preference

HX OF GI BLEED

Still desire NSAID...
ACR says...
GI ulcer but no bleed in 1 year
  - COX-2 or NSAID + PPI
GI bleed in last year
  - COX-2 + PPI
INJECTIONS

- Steroids
- Roosters (farm friendly)

GLUCOCORTICOID INJECTIONS

2004 meta analysis, 10 studies
Improvement up to 2 weeks
- NNT 1.3 to 3.5
No significance at 16-24 wks
- But RR 2.09, NNT 4.4
1 study – no difference in joint space, 2 yrs
50 mg Pred equiv or 20 mg triamcinolone

INTRAARTICULAR HYALURONAN

2005 meta-analysis, 22 studies
- Decr rest pain at 2 to 6 wks
- Decr pain at 10 to 14 and 22 to 30 wks
- Poorly designed or industry sponsored
- Not recommended
2006 Cochrane, 28 studies
- Same as IA steroids at 1 to 4 wks
- Slower in onset
- Better at 5 to 13 wks

$500 injection
Cash only
Series of 3 to 5 shots

SMALLER NEEDLES, DIFFERENT JUICE

ACUPUNCTURE

2007 meta-analysis, 11 RCTs
Vs sham
- Statistically sig difference vs sham
- “no or minimally clinical relevant effects”
Vs wait list or usual care
- Significant and “Marked clinically relevant effects”
- Sustained at 6 mths
ACUPUNCTURE
Same authors
2010 Cochrane
Vs sham
• Significant but not clinically relevant
Vs waiting list
• Significant and clinically relevant
• Gotta be placebo

GLUCOSAMINE/CHONDROITIN
2006 - Glucosamine/chondroitin Arthritis Intervention Trial (GAIT) - 24 wk, randomized, double-blind trial
Participants: 1583 > 40yrs with knee pain for > 6 months and radiologic evidence of OA
Five Groups:
1. 500 mg of glucosamine hydrochloride three times daily
2. 400 mg of sodium chondroitin sulfate three times daily
3. 500 mg of glucosamine plus 400 mg of chondroitin sulfate three times daily
4. 200 mg of celecoxib (Celebrex, Pfizer) daily
5. Placebo
Results: Not clinically significant relief from glucosamine and chondroitin as compared to placebo. Outcome measured was % decrease in pain.
2009 – Cochrane Review: 25 RCT of 4983 participants. No statistical significance in reduction of pain, stiffness, or function.

GLUCOSAMINE
An amino sugar which is converted into cartilage proteoglycans that stimulate chondrocyte metabolism and may slow progression of disease process.
Dose: 500mg TID

CHONDROITIN
A glycosaminoglycan that inhibits action of degradative enzymes.
Dose: 1000 – 1200mg daily

OPIOIDS
ACR says...
IF
No other Tx response and...
Does not desire or...
Is not a candidate for orthoplasty...
THEN
Follow APS/AAPM recs

OUR PATIENT
• Failed trial of Acetaminophen
• NSAIDs PRN, with food
• PPI?
• PT for quad strengthening
• Weight loss & Exercise
• Neoprene sleeve > brace
• Intraarticular corticosteroids

REFERENCES
Up To Date: “Pharmacologic therapy of osteoarthritis” Last updated 10/16/11.
Up To Date: “Nonpharmacologic therapy of osteoarthritis” Last updated 10/20/11.
REFERENCES

http://www.fammed.wisc.edu/integrative/modules/osteoarthritis
UpToDate. Diagnosis and Classification of Osteoarthritis. Updated April 2012.