Knee Pain: Evaluation and Cost Conscious Management

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Disclosure of Financial Relationships

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Has no relationships with any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.
Common knee problems
Common knee conditions

- Ligament injuries
- Meniscal injuries
- Arthritis (osteoarthritis)
- Problems of the patello-femoral joint
ANATOMY: Building a Knee

Parts List:

- 4 Bones
- 2 Tendons
- 4 Ligaments
- 2 Types of Cartilage
Posterior Cruciate Ligament (PCL)
Medial Meniscus
The Extensor Mechanism

- Quad Muscle
- Quad Tendon
- Patella
- Patellar Tendon
Building a Knee
Ligament Injuries
Ligament Injuries: History

- High Energy Injuries
- Sometimes feel a “pop”
- Swelling (within an hour or two)
- Once the pain subsides: INSTABILITY
Ligaments: Physical Exam

- Varus
- Valgus
- Anterior Trans
- Posterior Trans
Physical Exam: MCL
Physical Exam: LCL
ACL Tests

Anterior Drawer Test
Iliotibial (IT) band
PCL Test

Posterior Drawer
PCL Test

“Sag Sign”
Studies

- X-ray: Yes (mechanism)
- MRI (maybe)
Physical Exam vs MRI for suspected ligament tears
Treatment of Ligament Injuries

Torn Collateral Ligaments heal without surgery

Torn Cruciate Ligaments require surgery
Rx = “Hinged Knee Brace”
ACL Tears

- Relatively Common
- Don’t Heal
- If untreated, result in arthritis
ACL Tears $\rightarrow$ Arthritis
ACL Tears ➔ Instability ➔ Meniscus Tears ➔ Arthritis
Treatment Option #1: Brace
Treatment Option #2: Surgery

- End to End Repairs Don’t Work
- Ligament Must be Replaced with a Graft
ACL Reconstructive Surgery

- Over 90% Success for restoring stability
- 75-80% Success for returning to sports
- Significant (Predicted) decrease in Arthritis later in life
MENISCUS
TEARS
Meniscus Tears: History

“Sided” pain

- Trauma +/-
- Mechanical symptoms +/-
- Swelling, other +/-
Meniscus Physical Exam

- Joint line tenderness
- Joint line pain with deep flexion
- McMurray’s test
Studies

- X-rays (If age over 40: YES)*

- MRI (Maybe)
Should I order an MRI?

- 50% of meniscus tears are asymptomatic in 6 weeks
- If ALL signs and symptoms are positive after 6 weeks: SURGERY
- If uncertain after 6 weeks, MRI
- Usually NOT cost effective in patients over 70
Surgical Treatment of Meniscus Tears

**Repair**
Whenever possible, your surgeon will try to repair your meniscus to maximize the shock absorption in your joint. This type of surgery may be an option if the tear is within an area supplied by blood, which allows for healing. Your meniscus is sutured together, possibly requiring an additional incision at the back or side of your knee.

**Removal**
If repair can’t be done, your doctor will remove as little of your meniscus as possible. Since the meniscus won’t completely grow back, the articular cartilage will now take over the role as shock absorber for your knee joint.
Arthroscopy for Meniscus Tears

- 30 minute Operation
- 80 – 90% Patient Satisfaction
- 80 – 90 % Return to Sports
- Good results for decreasing development of Arthritis
arthritis
(osteoarthritis)
Arthritis History

- Age (High Mileage)
- Past trauma
- Rheumatic disease
- Previous surgery
Physical Exam

- Angular deformities
Physical Exam
Physical Exam
Making the Diagnosis

- History: Age ("high mileage" joints)
- Physical Exam
- X-RAYS
Meniscus Tear vs Arthritis?
X RAYS

Don’t Order: “knee series”

• Non-weight bearing AP
• Lateral
• Obliques
X Rays

- Wt bearing AP
- Wt bearing 60 deg PA
- Lateral
- Merchant’s view (aka “sunrise”)
Getting the right x-ray views

- Wt bearing AP
- Wt bearing 60 deg PA
- Lateral
- Merchant’s (aka “sunrise”) view
Getting the right x-ray views

- Wt bearing AP
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- Lateral
- Merchant’s (aka “sunrise”) view
Image Access
Treatment: Non-Surgical

- Anti-inflammatory Medicines $/++
- Supplements $/+
- Braces $$$$/+ 
- Cortisone Shots $/+++ 
- Viscosupplementation Shots $$$$/+ 
- Weight Loss ??/?? 
- Cane, Crutches, Walker $/+ 
- Physical Therapy $$/++
Arthritis Treatment: Surgical
Total Knee Replacement
Treatment Options?
Unicompartmental Knee Replacement
Problems of the patello-femoral joint
History

- More common in females
- Often bilateral
- Pain is anterior
- Worse with stairs (esp descending)
- Worse with squatting
- Worse with prolonged sitting (theater sign)
Physical Exam

- Test patello-femoral mobility
- Check for “noise”
X-Ray

- Merchants/sunrise/subpatellar view
Normal
Arthritis
Tracking problem
Tracking problem and arthritis
End Stage
Treatment

- Physical therapy/NSAIDs
  - strengthen the medial quad
  - stretch the lateral retinaculum

- Braces

- Cortisone injections
Treatment (surgical)

- Lateral release
- Tibial tubercle transfer
- Maquette tibial tubercle osteotomy
- Knee replacement
Lateral Release

Medial retinaculum (stretched)

Lateral retinaculum (tight)
Tibial Tubercle Transfer
Diagnosis: Unknown
Stage 1

- OTC NSAIDs

- Simple home stretches: (Ham/Quad, hold for 30 seconds each, 3 sets twice a day)

- Stationary bike: 20 min/day, 5 days/week for 6 weeks
Stage 2

- Do nothing
  
  Cost = 0
- Do nothing
  Cost = 0

- Physical Therapy
  Cost = $720 ($80 initial visit, $60 per f/u visit, 10 visits, medicare)
- Do nothing
  Cost = 0

- Physical Therapy
  Cost = $720

- MRI
  Cost = $460 (medicare rate)
- Do nothing
  Cost=$0

- Physical Therapy
  Cost=$720

- MRI
  Cost=$460

- Cortisone Injection
  Cost=$66.47 ($4.67 supplies, $62 injection fee, medicare CPT code 20610)
Corticosteroid Injections

Corticosteroid
(Kenalog, Aristacort)

1 cc

Lidocaine
1% without epi

4 cc
Syringe and Needle

22 gauge 1\(\frac{1}{2}\) inch needle

Syringe with Luer-Lock (screw-on) tip
Prep

- Betadine
- Alcohol
- Gloves
- Lidocaine
- Cold Spray (ethyl chloride)

Infection rate = 1:15,000

Clin Fam Prac, Vol 7, 2: 2005
General Rules...

- No more than one injection per month
- No more than 3 injections per year
- Don’t inject infected areas

J Bone Joint Surg Am 1975;57:70-6
Curr Opin Rheumatol 1999;11:417-21
ACTA Orthop Scand 1997;132-4
Knee Joint Injection Technique

- Pt supine on table
- Knee extended
- Muscles relaxed
- Lateral approach
- Sub-patellar

1cc Steroid, 4cc Lidocaine

Thank You!

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Physical Exam

**SEATED**
- Crepitation

**SUPINE**
- Patella mobility/irritability
- Extension/Flexion ROM
- Hip internal/external ROM
- Joint line tenderness/McMurray’s test
- ACL and Collateral exam