

## Definitions

- Sprain - ligament injury
- Strain - muscle injury
- Tendon - connects muscle to bone
- Ligament - connects bone to bone
- Laxity - amount of joint translation
- Subluxation - pathologic laxity
- Dislocation - no contact of joint surfaces



## Grading Ligament Injuries

- I - intra-substance tear; stable
- II - partial thickness tear; slight laxity
- III - complete tear; unstable, weak
- Key element - "Is there an endpoint?"



## Common Office Knee Problems

- "Jumper's knee" / Patellofemoral pain
- Meniscus tear
- MCL sprain
- Pes anserine bursitis
- "Runner's Knee" - ITB
- "Trick knee" - ACL tear
- Chondral injury
- Arthritis



## History

- Trauma
- Chronicity
- Swelling
- Buckling, locking, giving way
- Other joints? Family history?
- Fevers / chills
- Referred pain
- Put one finger where it hurts...



## Anterior Knee Pain

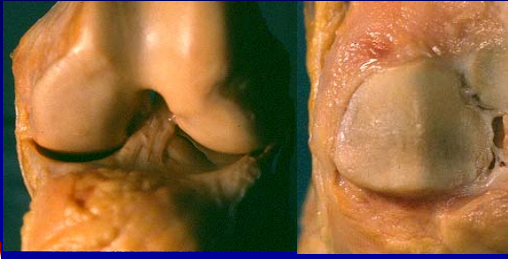
- "Chondromalacia"
- Chondral defect
- Maltracking
- Anterior interval syndrome
- Captured patella
- Young females
- Role of rehabilitation
  - quad strengthening
  - bracing



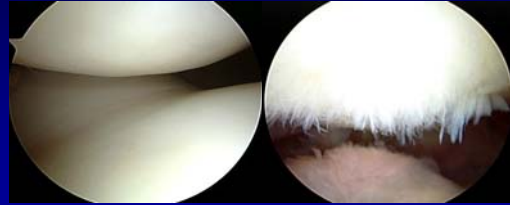
## Surface Anatomy



## Patellofemoral Joint



## Patellar Chondrosis: "Chondromalacia"



## Patellar Tendinitis: "Jumper's Knee"

- Common in jumping sports such as basketball, volleyball
- Hx:
  - Anterior knee pain
  - pain with stairs
  - getting out of chair
  - "movie-theater sign"



## Patellar Tendinitis: "Jumper's Knee"

- Dx: Tender at inferior pole of patella



## Patellar Tendinitis: "Jumper's Knee"

- Avoid jumping, running
- Ice, NSAID's, U/S, stretching
- Beware of injections!
- ? Associated intra-articular pathology

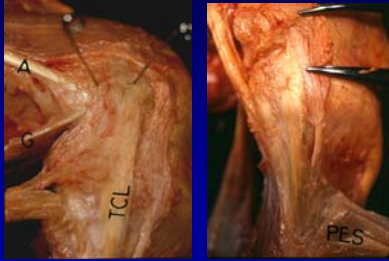


## Medial Sided Knee Pain

- Medial meniscus tear
- MCL sprain
- Pes anserine bursitis
- Chondral defect
- Arthritis

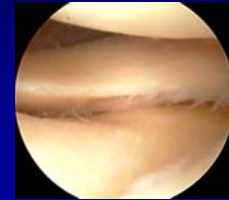


## Medial Side of Knee



## Meniscus Tear: History

- Pain (often localized to joint line)
- Swelling
- +/- twisting injury
- “catching” or “locking”



## Meniscus Tear: Examination

- Effusion
- Pain with hyperflexion or extension
- Joint line tenderness



## Joint Line Identification



## Meniscus Tear

- Clinical exam most important
- MRI - can be helpful
- Rx: arthroscopic surgery
- Natural history
  - over 90% remain symptomatic



## Chondral defect

- Hx: symptoms mimic meniscal tear
- Dx: MRI vs. arthroscopy
- Rx: arthroscopic surgery



## MCL Sprain

- Hx: Valgus injury to knee, pain, +/- swelling



## MCL Sprain

- Dx: Tender over MFC; pain +/- laxity with valgus stress at 20 degrees



## MCL Sprain

- Rx: Ice and compression, Immediate ROM +/- crutches
- Short neoprene hinged-brace for 6 weeks - very helpful and well-tolerated
- Rehab
  - » Stationary bicycle, water exercises, one-leg stands, dips
- Return to sport
  - I : 7-10 days
  - II : 3 weeks
  - III : 4-6 weeks

## Pes Anserine Bursitis

- Typically 50 – 70 year old female
- Overweight
- Often mal-aligned
- Tender 6cm distal to joint line



## The Swollen Knee

- Traumatic
  - » Onset – immediate vs. delayed
  - » Able to bear weight
  - » Pop?
- Atraumatic
  - » Family history of inflammatory
  - » Fevers, chills
  - » Chronicity



## Case

- 24 y.o. man
- c/o right knee swelling, pain
- Fell while skiing
- Felt a “pop”
- Couldn't ski down
- Immediate onset of swelling



## ACL Tear

- Common sports injury
  - basketball, football, skiing, soccer
- Hx:
  - Twisted knee
  - heard or felt a "pop"
  - immediate swelling
  - difficult to walk initially



## Anterior Cruciate Ligament Tear

- Mechanism:
  - Twisting
  - Cutting,
  - Pivoting (valgus/rotation force)



## Anterior Cruciate Ligament



## ACL Tear

Effusion



Lachman



## ACL Tear

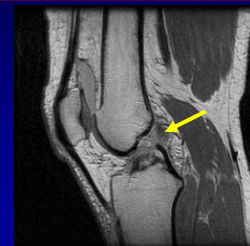
Anterior Drawer



Pivot Shift



## ACL Tears



## Treatment of ACL Tears

- Treatment options
  - operative vs. non-operative
- Role of bracing
  - higher risk for re-injury
- Natural history of ACL-deficiency
  - often DID in active population
  - meniscal tears
  - direct chondral injury



## Treatment of ACL Tears

- Indications for surgery
  - active individual
  - chronologic age not rigid guideline
  - symptoms of instability
  - associated injuries
- Results of Surgery - predictable
- Return to work / sports guidelines



## Fractures

- If trauma, get xray!!
  - Patella
  - Tibial plateau
  - Proximal fibula - check ankle



## Key Points to the Swollen Knee

- Something is wrong... Not "just a sprain"!
- History of trauma important
  - Always get x-rays if h/o trauma
- 3 causes of traumatic effusions
  - ACL tear
  - meniscus tear
  - osteochondral fracture
- In setting of trauma, most should probably be referred



## Case

- 44 year old man
- Effusion
- Pain with ROM
- Stable
- Diffusely tender



## What's Next?

- 1) CBC with diff, ESR
- 2) Knee x-rays
- 3) MRI
- 4) Stat rheumatology consult
- 5) Stat ortho consult
- 6) Nothing ... "just a sprain"



## Inflammatory Arthritis

- Generally no h/o trauma
- Other joint pains
- Family history



## Take home point

No trauma, pain with PROM ...  
Think *sepsis*

## Arthrocentesis

- Required to r/o infection
  - › Avoid areas of erythema
  - › False negative rate up to 40%
  - › “Read newsprint through fluid”
  - › WBC > 50,000
  - › Glucose < serum level
- Gout



## Arthritis

Hx:

- pain, swelling, “crunching”, limited ROM, worse in a.m., activity related
- Usually atraumatic

Dx:

- ROM, crepitus, tenderness, alignment, x-ray



## “Baker’s Cyst”

- Fluid filled cyst deep to semimembranosus
- Symptom of underlying intra-articular problem
- Can rupture and mimic DVT



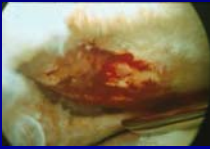
## Arthritis: Treatment Algorithm

- NSAID’s
- Sof-Soles
- P.T.
- Glucosamine / Chondroitin
- Viscosupplementation
- Steroids



## Arthritis: Surgical Options

- Arthroscopy
- Osteotomy
- Arthroplasty



## Case...Don't forget

- 78 y.o. woman c/o right knee pain
- Doesn't recall any h/o trauma
- Standing / walking make it worse
- Pain putting on shoes / socks
- Improves with rest

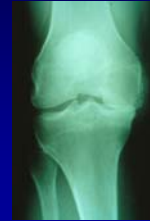
## Case...don't forget

- Wheelchair
- Difficulty arising to exam table
- Slight soft tissue swelling at knee
- Crepitus, joint line tenderness
- Pain with FF / IR of hip



## What's Next?

- 1) Knee x-rays
- 2) Knee MRI
- 3) CBC with diff, ESR
- 4) Hip x-rays
- 5) Celebrex

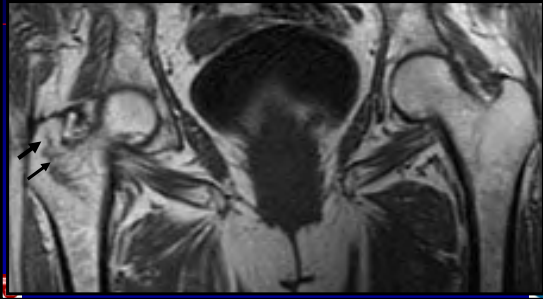


Now what?

## "Knee" Pain in the Elderly

- "Show me where it hurts"
- Think "Hip" when pain is distal thigh / "knee"
- Repeat hip films
- Bone Scan
- MRI

### Physical Exam more important than early X-rays



### Take home point

Pain with IR of hip means hip joint problem

### Occult Hip Fractures

- Surgery
- Non-operative treatment has higher morbidity
  - » pulmonary complications
  - » decubiti
- Up to 50% mortality in first 2 years
- Social service issues

### Case 2

- Marked effusion
- 15° - 40°
- Trace lachman
- Lateral joint line tenderness



### What's Next?

- 1) CBC with diff, ESR
- 2) Knee x-rays
- 3) MRI
- 4) Stat rheumatology consult
- 5) Nothing ... "just a sprain"



### Anterior Cruciate Ligament Tear

- Mechanism
  - » twisting, cutting, pivoting
  - » valgus / rotation force
- Common sports injury
  - » basketball
  - » football
  - » skiing
  - » soccer



## History



- "Twisted knee"
- Heard or felt a "Pop"
- Immediate swelling
- Difficult to walk initially
- +/- Giving way



## ACL Tear

Effusion



Lachman



## ACL Tear

Anterior Drawer



Pivot Shift



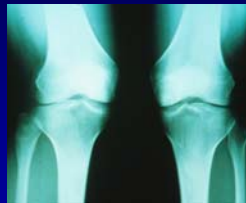
## Treatment of ACL Tears

- Treatment options
  - operative
  - non-operative
- Role of bracing
- Higher risk for re-injury in ACL-deficient knee



## Natural History

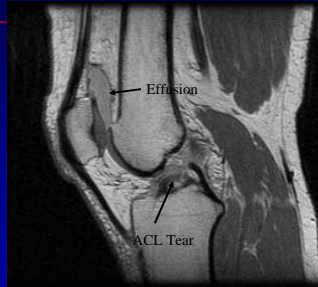
- DJD in active population
- ? Secondary to meniscal tears
- ? Direct chondral injury



## Treatment of ACL Tears

- Indications for surgery
  - active individual, +/- age, symptoms of instability, associated injuries
- Results of Surgery
  - very predictable with low rate of complications
- Return to work / sports guidelines
- Refer to ortho

## MRI



## Case 3

- 24 y.o. man
- c/o right knee swelling
- No h/o trauma
- +/- pain with ROM
- No fevers, chills



Thank you



Team approach:  
Don't hesitate to ask a colleague



Thank you

