

The Knee: Physical Exam and Basic Treatment of Common Pathologies

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Physical Examination of the Knee

- Inspection
- Palpation
- Range of motion
- Ligament Stability Tests
- Meniscal Rotation Signs
- Patellar Evaluation



Inspection

- Effusion
- Ecchymosis
- Abrasions
- Deformities
- Alignment



Inspection

- Quadriceps tone & atrophy



Physical Examination of the Knee-Ecchymosis

- Inspection



PLC Corner Injury



Hamstring Strain

Inspection-Swelling



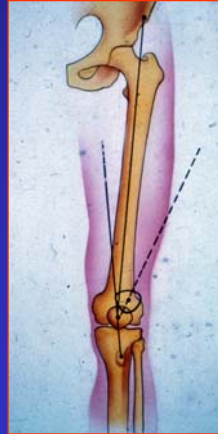
Prepatellar Bursitis



Lateral Meniscal Cyst

Physical Examination of the Knee

- Inspection
- Alignment
- Q angle



Physical Examination of the Knee

- Assess Hip ROM
- Check leg lengths
- Observe gait
- Check foot alignment
- Generalized lig. laxity

Physical Examination of the Knee



Assess ROM



Measurements



Patellar Examination

- Tracking
- Q angle
- Lateral tilt
- Apprehension sign
- Patellar mobility
- PF crepitation
- Assess hamstring, quad, ITB flexibility




Patellar dislocation

HISTORY

- Often initially traumatic event
- Sudden pop
 - “My knee came out”
- Often spontaneously reduced
- Effusion
- Pain
- Inability to weight bear

Patellar dislocation

Exam

- Tenderness on lateral trochlea
 - Tenderness medial patella
 - Moderate to large bloody effusion
 - “Apprehension sign”
 - Beware if non-traumatic, female,
< 25 years of age, valgus morphotype
-  chronic subluxators/dislocators

Patellar dislocation

Treatment

- First time dislocators:
 - Initially crutches, modalities, Patella J brace
 - After 7-10 days PT, Quad (MVO) strengthening, ROM
 - Gait training if patient hyperextends knee during gait cycle
- Beware if: recurrent swelling, mechanical sx
→ osteochondral fragment / loose body

Patellar dislocation

Outcome

- First time dislocators > 90% g/e outcome with non-operative tx
- If mechanical sx, recurrent swelling or recurrent instability may require surgery

Patellar Tendinitis

HISTORY

- Pain inferior pole of patella, patellar tendon
- Overuse activity with jumping
- No specific traumatic event

Patellar Tendinitis

- Local distal pole tenderness
- Crepitance
- Tight hamstrings
- Tight quads
- No effusion



THREE PHASES

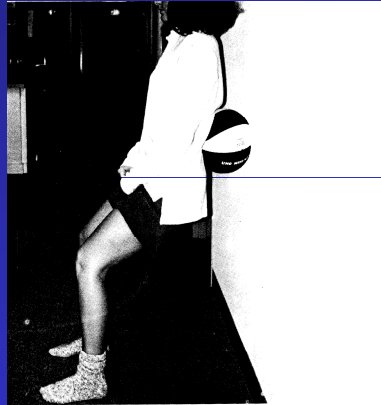
- Phase 1 - pain after activity
- Phase 2 - pain during and after activity
- Phase 3 - prolonged pain with impairment

PHASE TREATMENTS

- Phase 1 - ice, compression, NSAIDS
- Phase 2 - more aggressive modalities
- Phase 3 - possibly surgery

EXERCISES

- Extensive flexibility program
- Eccentric exercises
- Increasing speed, weight
- Strengthen ankle dorsiflexors
- Muscle balance



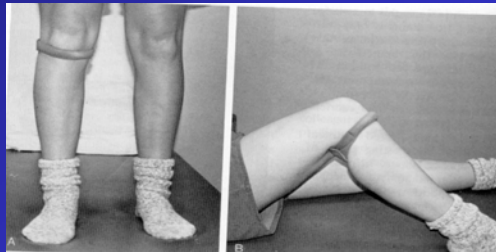
THERAPEUTIC MODALITIES

- ICE
- HEAT
- ULTRASOUND
- NSAIDS

Symptomatically helpful

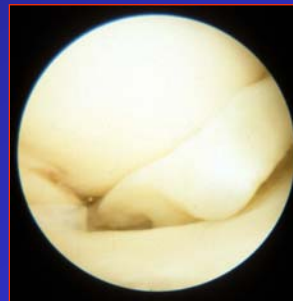
INFRAPATELLAR STRAPS

- Encircle patellar tendon and compress
- Alters stresses within tendon
- Variable result
- Taping to project distal pole anteriorly



Meniscal Examination

- Joint Line Tenderness
- Referred Pain with flexion, rotation and extension
- Effusion
- Lack of Extension
- Mechanical sx



Meniscal Exam



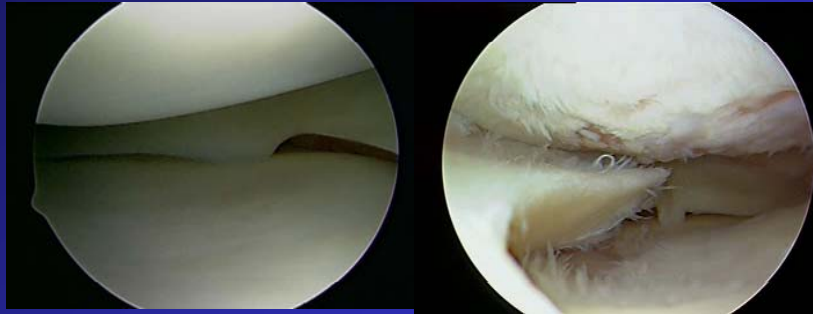
Meniscal Exam

Palpate entire joint line

- medial
- lateral



Meniscus tear \neq Meniscus tear

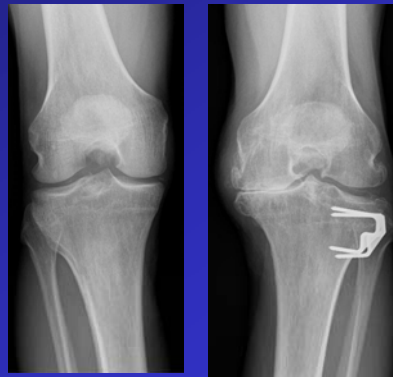


Degenerative meniscal tears are part of the natural history of OA
A degenerative meniscal tear may not be symptomatic

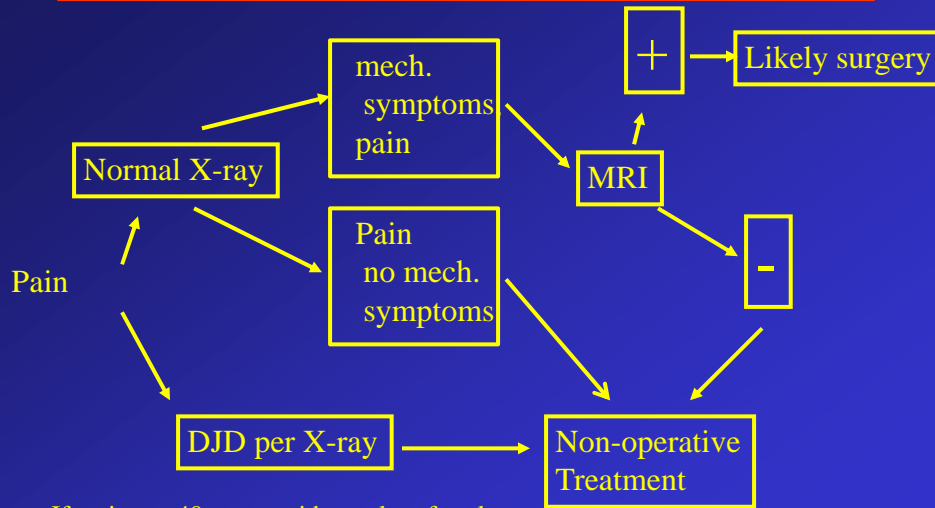
MRI findings

Three step approach

1. Plain X-ray
2. Re-evaluation
3. MRI



Meniscus Tear flow chart



If patient < 40 yo, consider early referral to evaluate for surgical treatment

Degenerative Meniscus Tear Treatment

Pain

- NSAIDS
- Steroid injections / PT
- Viscosupplementation



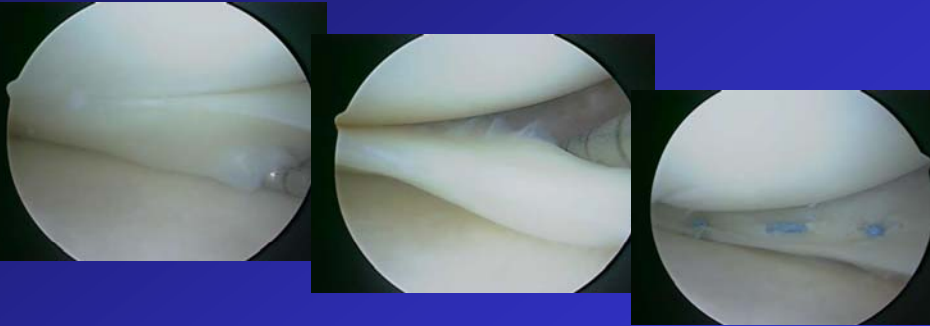
Arthroscopy is as effective as an injection !!

Mechanical Sx

- Arthroscopy most effective treatment

Acute Meniscus Tear Treatment

Younger patients (<30)



Surgical repair vs. partial meniscectomy

Knee Instability

- “My knee gives way”
 - With twisting, cutting, uneven ground
→ think ligament
 - With getting up, going up and down stairs
→ think extensor mechanism

ACL Exam-Lachman

- Lachman



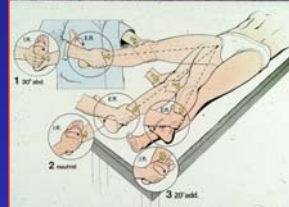
ACL Exam-Anterior Drawer

- Lachman
- Anterior Drawer
- Pivot Shift
- Quad Activated Lachman



ACL-Pivot Shift

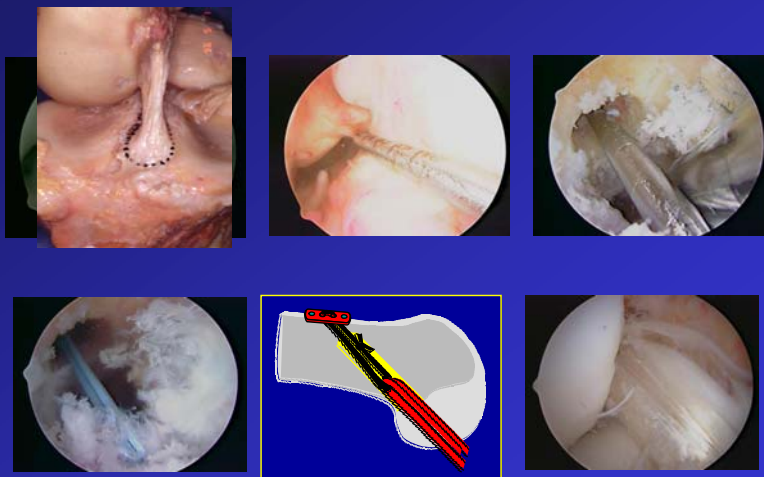
- Pivot Shift Phenomenon
 - Subluxation-reduction phenomenon pathognomonic of ACL-D
 - Varied tests described
 - Hughston, Losse, Jerk, FRD, Galway



ACL Treatment

- Acute
 - Crutches, ROM-brace
 - Decrease swelling, PT
 - Usually surgical reconstruction in younger patients
- Beware if patients have a block to full extension
 - Bucket handle meniscus tear

ACL Reconstruction



MCL Examination

- Valgus 0 Degrees
- Valgus 30 Degrees
 - Grade 1 (0-5 mm)
 - Grade 2 (6-10mm)
 - Grade 3 (11-15 mm)



Treatment

- initially hinged brace, WBAT
- ROM with brace
- Usually non-operative treatment
- Exception: multi-ligament injury



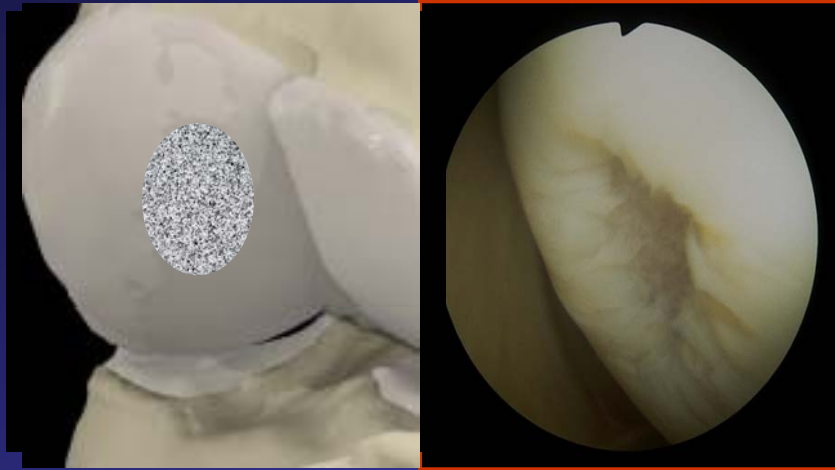
LCL Examination

- Varus 0 Degrees
- Varus 30 Degrees
- Exclude Posterolateral Corner
- Dial Test
- Posterolateral Spin
 - 30, 90 degrees



Unusual injury, often in conjunction with a knee dislocation

Articular Cartilage Defects

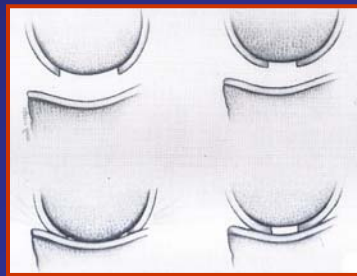
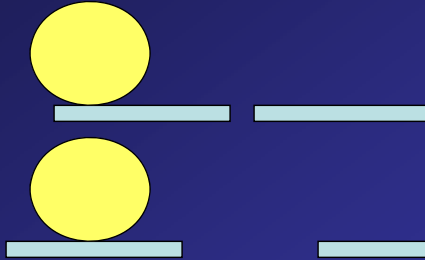


Articular Cartilage Tears



Articular Cartilage Tears

- Pain
- Catching
- Crunching
- Giving-way
- Swelling



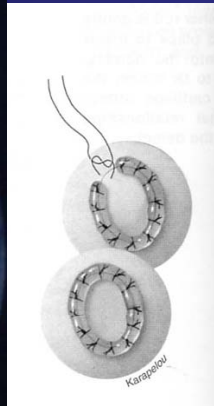
New Surgical Techniques for Cartilage Repair

Microfracture Treatment



New Surgical Techniques for Cartilage Repair

Cartilage Cell Transplantation



What is Osteoarthritis?

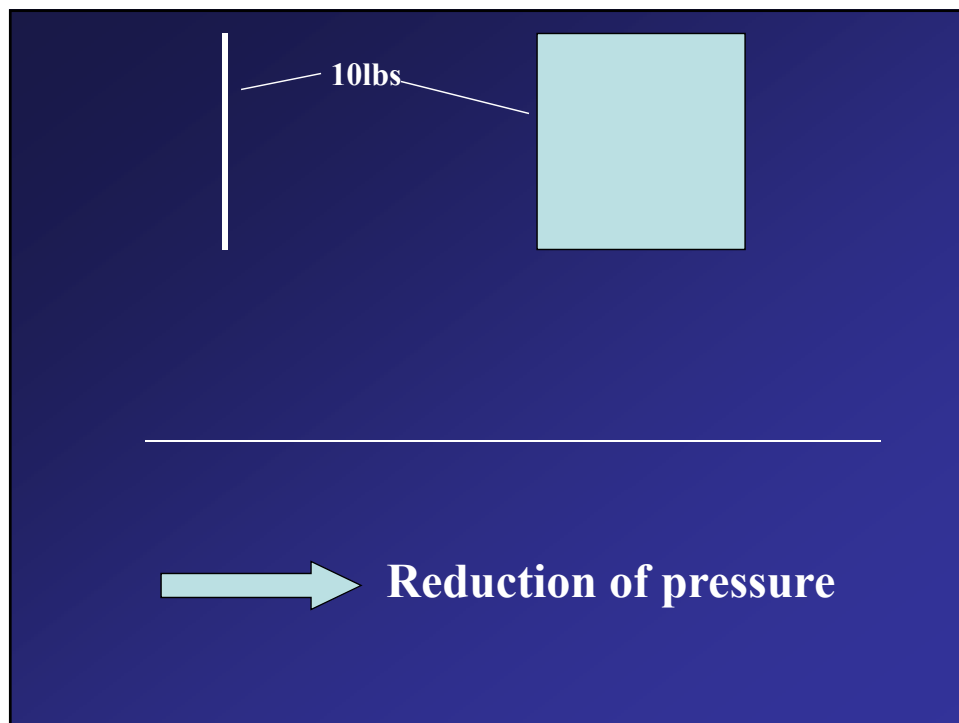


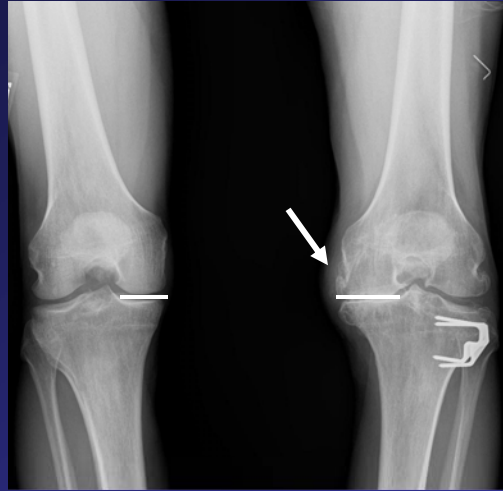
- Disease of one or several joints
- Wear and tear of the natural bearing system of a human joint

The body's response to heal damaged cartilage

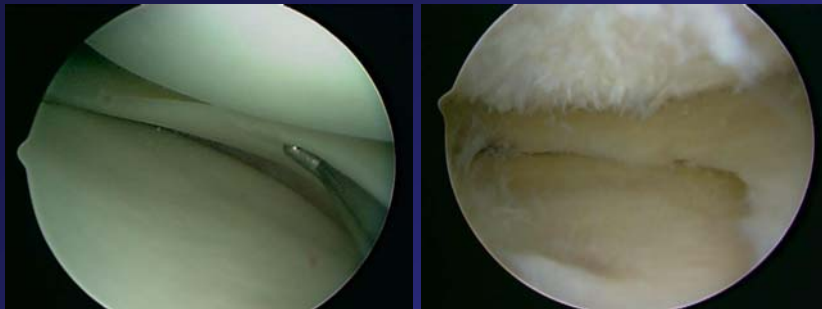


$$\text{Pressure} = \text{Force}/\text{Area}$$
$$\text{Pa} = \text{lbs}/\text{in}^2$$





Reduction of pressure



Increased friction = stiffness

What Causes Osteoarthritis?

- Trauma
 - Twisted knee, torn ligaments, broken bone
- Repetitive injuries/overuse
- Wear and tear
 - Natural process of aging
- Our genes?



How to Treat Osteoarthritis ?





There is No Cure for Osteoarthritis

Let's organize this

- Diagnosis
- Life style changes
- Physical activity and therapy
- Nutrition
- Medication
- Surgical options

Diagnosis

- Age: < 40, 40-50, >50
- Symptoms: mechanical, pain, swelling
- When? Rest, activity, mornings or evening

	Cartilage defect	Osteoarthritis
Age	< 40, 40-50	>50
Symptoms	Swelling Mechanical Pain	Pain Swelling Mechanical
When?	Activity evenings	Rest Mornings

Lifestyle changes

- Modification of activities
- Use of tools
- Reduce stress



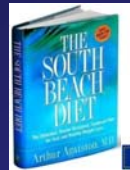
Physical activity

- PT
- Low impact
- Regular exercise
- Muscular balance/TENS
- Yoga/Pilates



Nutrition:

- Weight loss diet (BMI)
- Nutritional supplements
 - Glucosamine / Chondroitin
 - Anti-oxidants (sulfates)
 - Natural anti inflammatories



Do those products actually work?

Yes, but ...

Topical Medication

- BENGAY®
- Campher, Menthol-based creams
- Anti-inflammatory creams (i.e. voltaren)
- Emu oil-based creams and others



Osteoarthritis: First Line Tx

- Tylenol®
- NSAIDS (i.e Ibuprofen, Aleve®, Advil®, naprosyn etc.)
- Centrally acting agents (i.e. Tramadol (Ultram®))
- Narcotics(not really an option)
- TNF- α blockers (i.e.Etanercept, Remicade®)



Injections

- Cortisone
- Viscosupplementation (i.e. rooster cartilage)



Arthroscopic surgery

- Mechanical symptoms
- General pain

