Knee Pathology 2

PT 614

Objectives

- Pathology - Tibiofemoral
  - Meniscal Lesions
  - Chondral Lesions
  - Osteochondritis Dissecans
  - OA
  - Baker’s Cyst
  - Quadriceps Contusion
  - Fracture
- Special Tests for each pathology
Meniscal Lesions

- **Mechanism**
  - Mostly due to rotational forces on the knee
  - Valgus force with IR typically produces medial meniscal tears
  - Varus force with ER typically produces lateral meniscus tears
- **Clinical manifestations**
  - Joint line pain
  - Mild to moderate swelling
  - Limited terminal flexion or extension
  - Locking of the knee during ROM
  - Instability may occur when the knee is flexed 20-30° (loose packed position)

Meniscal Lesions

- **Diagnosis**
  - Small tears are difficult to diagnose
  - Prognosis is good in children/adolescents secondary to the vascular supply to the periphery of the meniscus
  - Can manipulate the knee joint to “unlock” the knee and allow the meniscal tear to lay down and thus heal in adolescents
Meniscal Lesions

A. Bucket handle tear
B. Tear of middle third
C. Tear of anterior tip
D. Longitudinal splitting of anterior third
E. Tear of posterior third

Meniscal Tears

- Indications for conservative treatment:
  - Lesion in vascular outer 1/3 of medial or lateral meniscus
  - Tear extending into central, relatively avascular 1/3 of meniscus of young or physically active older individual
- Contraindications:
  - Tear localized to inner avascular 1/3 of meniscus
  - Tear with considerable fragmentation
  - Tear that can’t be completely reopposed
Meniscal Tests

- McMurray Test (67/69 M; 53/88 L; 28/92 Comb)
- Apley’s test (41/93 M; 41/86 L; 16/100 Comb)

Articular Cartilage Lesions
Articular Cartilage Lesions

- Tear of the articular cartilage of the femur or posterior surface of the patella
- Mechanism is similar to that of the meniscus and rarely occur in isolation
- Often present in DJD
- Clinical manifestations
  - Dull achy pain with mild swelling
  - Consistent clicking in the knee during A/PROM
  - No episodes of instability
  - Pain increases with knee flexion past 90 degrees
- Diagnosis
  - Repeatability of the click is highly diagnostic
  - Palpation of the distal femur producing localized pain

Musculoskeletal Impairments III

Articular Cartilage Lesions

- Variety of procedures have developed since the early 90’s
- Indications for surgical repair:
  - Symptomatic knee caused by small to large lesion
  - Typically involved WB portion of joint
    - Medial/lateral condyles
    - Trochlear groove
    - Articulating facets of patella
- Selection criteria:
  - Size
  - Depth
  - Location
  - Elapsed time since occurrence
  - Patient’s age
  - Intended activity level
A joint injury where there is a partial or complete detachment of a fragment of cartilage and subchondral bone from the articular surface of the femur. Most common location is the medial femoral condyle. Mechanism is most commonly traumatic but may also have a non-traumatic cause. Trauma either from medial femoral condyle fracture or from direct fall on the patella which drives into the femur injuring the cartilage.
Osteochondritis Dissecans

- **Mechanism:**
  - Non-traumatic from decreased blood supply to the medial femoral condyle leading to weakening of the underlying subchondral bone resulting in a fragment of cartilage/bone breaking off

- **Patient presentation:**
  - In cases where the cartilage is still attached, the patient typically reports a mild ache with minimal swelling in the medial compartment but may not be able to actually palpate the site of lesion.

- **Patient presentation:**
  - If the fragment has detached, then the pain is more severe with the presence of joint locking due to a loose body floating around in the joint.

- **Diagnosis**
  - Presence of a blocked joint ROM and localized pain
  - Localized pain to the femoral condyle when the knee is flexed

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*Image: Partial view of a knee.*

*Caption: Medial femoral condyle (arrow).*

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*Image: Diagram of knee with highlighted area.*

*Caption: Osteochondritis Dissecans: Location of lesion in the medial femoral condyle.*

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*Muscloskeletal Impairments III*
Osteochondritis Dissecans

Conditions of Hypomobility
**Knee DJD**

- Posterior osteophyte formation resulting in limitation in knee flexion

- Hard and painful end-feel is often felt in extension and flexion

- More disability and clinical symptoms result from OA of the knee than from any other joint

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**X-ray of Normal vs Osteoarthritis of the Knee**

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Muscloskeletal Impairments III
**Baker’s Cyst**

- OA (DJD), post-traumatic arthritis, RA, Post-immobilization
- F > E restriction
- With effusion, knee assumes 25° F for greatest capsular distention
- Stiffness, pain, and reflex quadriceps inhibition (quad lag)
- Difficulty with functional ADL’s, stairs, ambulation

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**Hypomobility**

- OA (DJD), post-traumatic arthritis, RA, Post-immobilization
- F > E restriction
- With effusion, knee assumes 25° F for greatest capsular distention
- Stiffness, pain, and reflex quadriceps inhibition (quad lag)
- Difficulty with functional ADL’s, stairs, ambulation
Pain and swelling in the distal lateral thigh where the ITB passes over the lateral femoral condyle

AKA runners knee

May be due to overuse or injury concurrent with the ACL

- 97% incidence of injury in patients undergoing ACL reconstruction surgery

Overuse results from:

- poor flexibility
- Repeated flexion/extension past 30° of flexion
- Increased pronation
- Increased tibial IR or anteversion/genu valgum
- Tight TFL or glut max
**ITB Friction Syndrome**

- Clinical manifestations
  - Pain localized to the lateral knee and distal thigh
  - Pain may be sharp and can be severe in acute cases
  - Pain with prolonged ambulation or riding bike
  - Pain initially upon standing and walking following prolonged sitting/sleeping
- Diagnosis
  - Pain with palpation to distal ITB
  - + Noble compression test

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**ITB Friction Syndrome**

- Noble Compression test
Deep Thigh Bruise

- Results from blunt force trauma
- Typically occurs in the vastus lateralis but may also occur anteriorly to the rectus femoris and vastus intermedius
- May lead to myositis ossificans

Myositis Ossificans of the Quadriceps
Knee Fracture Rules

Ottawa Knee Rules for Fractures:

- Age 55 or older
  1. Isolated tenderness of the patella without other bone tenderness
  2. Tenderness of the head of the fibula
  3. Inability to flex to 90 degrees
  4. Unable to bear weight both immediately and in the ER (4 steps) regardless of limping

Muscloskeletal Impairments III