Common Adult Lower Extremity Issues

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Case #1

• 28 year old male with acute onset knee pain while playing basketball today
• Pain and immediate swelling after coming down from rebound
• Unable to bear weight
• Felt a pop at the time of injury
Ligamentous Anatomy

Friedberg, 2016
Case #1

• Exam
  • Large effusion
  • Anterior drawer (knee flexed at 90º) negative
  • Lachman’s (knee flexed 15-20º) positive
  • Collateral ligaments intact
Anterior Cruciate Ligament Tear

• Primary anterior and rotational stabilizer
• May be other associated injuries
• Typically non-contact deceleration injury
• One third to ½ report a “pop” & immediate effusion
• Painful ROM and inability to bear weight
Anterior Cruciate Ligament Tear

• Diagnostic tests
  • Plain films may show avulsion of tibial insertion but usually normal
  • MRI shows discontinuity of ligament
  • Arthrocentesis
    • Can be performed to relieve pain and assess hemarthrosis
    • Fat globules in aspirate suggest fracture
    • Blood may clot after 24 hours making aspiration difficult
ACL Tear - MRI

Friedberg, 2016
Anterior Cruciate Ligament Tear

• Treatment
  • Varies according to age, activity level and associated injuries
  • Initial TX should include PRICE followed by WBAT, ROM and isometric quad exercises
  • Re-examination 10-14 days post injury
  • Rehab and functional bracing less favorable in young, active patient
  • ACL reconstruction

• Prevention with proper training
Case #2

• 40 year old female with medial left knee pain and occasional clicking
• Most often with “plant and pivot” activity
• Symptoms are intermittent
• Knee “gives out”
• Knee swells after clicking or buckling
• Effusion improves with NSAIDs
Case #2

- Clinical symptoms
  - Minimal or no trauma
  - Gradual onset of effusion and stiffness
  - Mechanical symptoms
  - Reports of instability

- Exam
  - Small to moderate effusion
  - Medial joint line tenderness
  - Pain with full flexion and extension
  - Pain and popping on McMurray test
Meniscal Tear

• May be traumatic or degenerative
• May be injured with ACL & MCL
Meniscal Tear

• Treatment
  • PRICE
  • Course of NSAIDs at anti-inflammatory dose
  • Physical therapy to maintain strength and ROM
  • Gradual return to activity
  • Recurrent catching, popping, locking will likely require surgical debridement
    • May consider injection

• Imaging
  • Wt bearing films with notch and sunrise views
  • MRI

• Arthroscopy for partial meniscectomy
Case #3

• 25 year old male with knee pain after collision on soccer field
• Knee forced into valgus
• Edema over several hours after the injury
• Pain with weight bearing
• Unable to fully flex knee
Collateral Ligament Tear

- Traumatic partial or complete tear
- May occur with meniscal, ACL, PCL tears
Collateral Ligament Tear

• Exam
  • Tendon may be tender along entire course
  • Examine MCL/LCL in slight flexion
    • Apply valgus stress
    • Apply varus stress

• Classification based on opening of joint space
Collateral Ligament Tear

• Treatment
  • Typically conservative for isolated tears
    • Must rule out ACL, PCL and meniscal tears
  • PRICE
    • Hinged brace in higher grade tears
      • Weight bearing as tolerated with crutches
  • Analgesia with acetaminophen or tramadol
    • NSAIDS probably OK
  • PT includes early ROM, quad strength and gait training
  • Surgical repair if other ligaments torn
Patella/quadriceps Tendinopathy

- Overuse or overload syndrome
- Associated with jumping sports
- May occur with erratic exercise habits
- Weight gain may play role
- Anterior knee pain
- Pain with sitting, squatting or kneeling
- Climbing stairs often increases pain
Patella/quadriceps Tendinopathy

• Exam
  • Tender at inferior or superior patella pole
  • May be mild edema
  • Fullness of infrapatellar bursa
  • AROM is normal but painful
  • Quadriceps atrophy if longstanding condition
  • Rule out other ligamentous injuries
Patella/quadriceps Tendinopathy

• Treatment is primarily symptomatic
  • Period of rest
    • Few days to a few weeks
    • Consider brief immobilization
  • NSAIDs at anti-inflammatory doses
  • PT with focus on ROM, extensor stretching and quadriceps strength
    • Ultrasound and phonophoresis may help
  • Knee sleeve with patella cutout or knee strap
Extensor Mechanism Rupture

- Force of jumping or heavy lifting
- May be trivial force in older patients

Symptoms
- Pain and swelling
- May report hearing or feeling a “pop”

Exam
- Unable to extend knee or do straight leg raise
- Partial tear may show weakness
- Walking is difficult
- Palpable defect in tendon
Extensor Mechanism Rupture

• Imaging
  • AP & lateral radiographs
    • Patella alta with rupture of infrapatellar tendon
    • Patella baja with quadriceps tendon rupture
  • MRI
    • Unnecessary with strong clinical findings

• Treatment
  • Surgical repair nearly always treatment of choice
Patellofemoral Pain

• Fraying of patella articular surface
  – Cumulative trauma
  – Malalignment
  – Patellar compression
  – Primary OA affecting women more than men

• Symptoms
  – Anterior knee pain after sitting, squatting
  – Pain with stairs and rising from chair
  – Effusion is rare
Patellofemoral Pain

• Exam
  – Observe standing and walking
    • Assess genu valgum, tibial torsion
  – Assess VMO development
  – Measure Q angle
    – Little evidence to support
  – Assess patella tracking
  – Palpate undersurface of patella

• Diagnosis
  – AP/lateral and merchant or sunrise views

O'Connor & Mulvaney, 2016
Patellofemoral Pain

• Differential diagnosis
  – Meniscal tear (joint line tender/mechanical Sx)
  – Patellar malalignment (radiographic/clinical)
  – Patellar tendinitis (tender inferior pole/tendon)
  – Quadriceps tendinitis (tender at insertion)

• Treatment
  – Short arc quad strengthening (progress to full)
  – Knee sleeve with patella cutout
  – NSAIDS and wt loss
Patellofemoral Instability

• Lateral tracking, subluxation, dislocation of patellofemoral joint
  • Nearly always lateral
  • Minor trauma (plant and pivot)
    • Anatomic predisposition
      • Patella alta, shallow trochlear groove, ligamentous laxity
    • Direct or indirect trauma normal mechanics
• Severe pain, may report a “pop”
  • May report knee deformity
    • Medial femoral condyle is prominent
  • Medial retinacular & patellofemoral ligament
• Spontaneous reduction is common
Patellofemoral Instability

• Exam
  • Apprehension with patella manipulation
  • Medial patella tenderness if retinaculum torn
  • Medial femoral condyle tender if pf ligament torn
  • May show apprehension without tenderness

• May notice on exam
  • Genu valgus knee alignment
  • Femoral anteversion
  • VMO weakness, tight hamstrings
    • J tracking
  • Patellar hypermobility
    • Lateral translation greater than ½ patella width
  • Tight lateral retinaculum
    • Can’t elevate lateral edge to horizontal
Patellofemoral Instability

• Diagnostic studies
  • AP, lateral and sunrise or merchant views
    • May see lateral tilt or sublux
    • Shallow trochlear groove and flat patella undersurface are risk factors
    • May see arthrosis with reduced lateral joint space and osteophytes
Patella Dislocation

O'Connor & Mulvaney, 2016
Patellofemoral Dislocation

• Treatment
  • **Closed reduction**
    • Flex knee to relax quads
    • Gently lift lateral patella and push medially as extending the knee
  • Ice, analgesia
  • Consider aspiration if effusion significant
  • Knee immobilizer no more than 6 weeks
    • Isometric quad strengthening
  • Begin ROM and more vigorous strengthening when medial tenderness resolves
  • Knee sleeve with lateral buttress
  • Realignment osteotomy with patellofemoral ligament repair and or lateral retinalcalvar release
Osteoarthritis of Knee

• Most common form of knee arthritis
  • Can involve any or all three knee compartments
    • Medial
    • Lateral
    • Patellofemoral
  • Commonly age over 55
  • Associated with obesity & family history
• May be secondary to trauma
  • Fracture
  • Meniscal/ACL tears
Osteoarthritis of Knee

• Symptoms
  • Pain associated with activity in early stages
  • Occurs at rest in later stages
  • Sensation of buckling or “giving out”
  • Stiffness and joint swelling that limits ROM
  • May have mechanical symptoms
Osteoarthritis of Knee

• Exam
  • May be varus or valgus deformity
  • Effusion
  • Tenderness along joint line with palpable osteophytes
  • Patellofemoral arthritis
    • Crepitus
    • Difficulty with stairs & chairs

• Diagnosis
  • Weightbearing AP, later and sunrise views
    • Joint narrowing, sclerosis, cysts & osteophytes
Osteoarthritis of Knee

• Differential diagnosis
  • Pes Anserine bursitis
    • Tender below medial joint line
  • Hip pathology
    • Painful and/or decreased ROM of hip
  • Lumbar radiculopathy
    • Neuro changes
  • Meniscal tear
    • Trauma Hx or mechanical symptoms
  • Septic arthritis
    • fever/malaise/abnormal joint fluid
Osteoarthritis of Knee

• Treatment
  • Maintain strength and motion
    • Biking, water aerobics, straight leg raise
  • Glucosamine sulfate
    • 1500mg/day for 6-8 weeks
    • *May* have disease modifying effect
  • Topical therapy
Osteoarthritis of Knee

- Pharmacotherapy
  - Acetaminophen
  - NSAIDs
- Cane on contralateral side
- Joint aspiration/injection
  - Corticosteroid
  - Viscosupplements
- Consider referral
  - Knee arthroplasty
Ankle Sprain

• More than 25,000 sprains daily
• Residual symptoms in nearly 40%
• Lateral ligaments most often affected
  • Inversion injury
  • Tibiofibular syndesmosis injury in “high” ankle sprain
• Subtalar joint may also be injured
  • Interosseous ligament tear
• Medial deltoid injury may also occur
  • Less common
  • Typically associated with eversion injury
Ankle Ligaments

Lateral ankle ligaments

- Fibula
- Tibia
- ATFL
- PTFL
- CFL
- Talus
- Calcaneus
- Fibularis brevis tendon

Maughan, 2016
Ankle Sprain

• Clinical symptoms
  • Pain over injured structures
  • Swelling
  • Loss of function
  • May report a “pop” in severe sprain
    • Followed by immediate swelling and inability to bear weight
  • May report history of previous sprain
Ankle Sprain

• Exam
  • Circumferential ecchymosis and swelling
  • Tenderness of affected structures
    • Palpate medial and lateral malleoli, base of 5\textsuperscript{th} metatarsal and navicular
  • Special tests
    • Anterior drawer
Ankle Sprain

• Special tests
  • Squeeze test
    • Compress tibia and fibula at midcalf
  • External rotation test
    • Dorsiflex ankle and externally rotate foot
  • Positive test results in pain at distal tibiofibular syndesmosis

• Subtalar joint injury may show tenderness and ecchymosis of medial hindfoot
Ottawa Rules

- Tenderness at distal fibula or tibia
- Tenderness at 5th MT base or navicular
- Inability to bear wt. immediately and in clinic

Maughan, 2016
Ankle sprain
Ankle Fracture
Ankle Fracture
Ankle Sprain

• Differential Diagnosis
  – Fracture of distal fibula, base of 5th metatarsal, medial malleolus, calcaneus, talus (tender over structure, apparent on radiograph)
  – Proximal fibula fracture (Maisonneuve- proximal fibula, deltoid TTP and positive squeeze test)
  – Peroneal tendon tear or subluxation (muscle weakness on eversion, may report repeated popping)
  – Osteochondral fracture of talar dome (evident on radiographs, MRI or bone scan)

Armstrong and Hubbard, 2016
Ankle Sprain

• Treatment
  • Analgesia with acetaminophen or tramadol
  • PRICE with vigorous elevation (toes above nose)
  • Consider cast or cast boot for 2 weeks if severe
  • WBAT (crutches as needed for a few days)
• Home therapy program
  • Range of motion
  • Stretching exercises after 2 weeks
  • Strengthening and proprioception exercises
• Stirrup splint for 6 weeks or more
• Formal physical therapy!
  • ROM, strengthening and proprioception
  • Chronic instability common after incomplete rehab
References/Resources

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