Common Hip Concerns

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SAHM Workshop
March 10, 2017
Case #1

ID: 13-year-old female dancer (all forms) presents with her mother
CC: 18 months of right hip pain
Differential Diagnosis
DDx

• Pelvis
  – Apophysitis of ASIS/AIIS, Iliac Crest
  – Hip pointer
  – Avulsion of ASIS/AIIS

• Hip joint
  – SCFE
  – Developmental dysplasia (DDH)
  – Legg-Calve-Perthes (LCP)
  – Femoro-acetabular Impingement (FAI)
  – Labral tear
  – Septic arthritis

• Lateral thigh
  – Greater trochanteric bursitis

• Soft tissues
  – Iliopsoas strain/tenosynovitis
  – Adductor (groin) strain

• Appendicitis

• GYN
  – Cervicitis/PID
  – Ovarian Torsion
  – Pregnancy

• Lymphadenitis

• Hernia
Muscles

- Hip Muscles
- Iliopsoas
- Pectineus
- Adductor longus
- Rectus femoris
- Tensor fascia latae

Front view ©MMG 2003
What do you want to know?
HOP-ROM-S

• History
• Observation
• Palpation
• Range Of Motion
• Strength
• Specialized testing
• Sports specific skills
History

- Acute vs. chronic problem?
- Mechanism of injury?
- Type(s) of activity, intensity, duration?
- Pain
  - Location
  - Timing (night-time?)
  - Characteristics (exacerbating/alleviating)
  - Intensity (on a 10 point scale)
- Mechanical symptoms (snapping, catching, popping, locking)?
- Instability symptoms?
- History of prior injuries?
- Treatments trialed, and effectiveness?
- Functional limitations?
HOP-ROM-S

- Observation: No obvious swelling, redness, deformities
- Palpation: Tender over anterior hip/groin in the soft tissues
- Range Of Motion: Full and equal on both sides
- Strength: 5/5 on MMT; provocative on resisted hip flexion
- Specialized testing:
  - Trendelenburg = Negative
  - FABER = Provocative
  - Ober = Negative
  - Thomas = Suggestive
Specialized Testing

• FABER
• FADIR
• Ober
• Thomas Test
• Gait Assessment (Trendelenburg)
F.A.B.E.R. Maneuver
F.A.D.I.R.

Hip impingement test
Ober Test
Thomas Test

"The Thomas test"
Trendeleburg Gait
When to image?

• Any unexplained unilateral complaints
• Any persistent unexplained bilateral complaints
• Red Flags =
  – Severe pain with trauma
  – Inability to bear weight
  – Pain which wakes from sleep
  – Pain with fever
  – Loss of internal rotation or abduction
X-rays
Iliopsoas Tenosynovitis

• Also called “Hip Flexor”; can include bursitis
• psoas muscle originates from lumbar spine and joins iliacus muscle originating from ilium, both muscles insert at lesser trochanter of proximal femur
• innervation is L1, L2, and L3
• action is flexion and abduction of hip
Etiology - Tight Hip Flexors
Symptoms

- Anterior thigh pain, groin pain
- Snapping in medial groin or thigh
Signs

- Patient may hold hip in flexion and external rotation
- May limp to prevent hyperextension
Diagnosis

• Exam findings
  – Positive Thomas test
  – Provocative active hip flexion and passive hyperextension

• Testing
  – Not indicated
Treatment

• Conservative measures
  – Relative rest
  – Ice
  – Compression and elevation not feasible
• Short course of NSAIDs
• Physical therapy
• Rare corticosteroid injection of iliopsoas bursa
• Even rarer fractional lengthening of iliopsoas tendon at musculotendinous junction
Prognosis

• Very good

• Complications
  – Persistent bursitis
  – Possible anterior labral injury
Case #2

ID: 12-year-old female dancer (all forms) presents with her mother
CC: Hip pain bilat (R>L) past few mo; worse in past wk
Another Snapping Hip

- Acute vs. chronic problem? Subacute
- Mechanism of injury? Dance; no specific trauma
- Type(s) of activity, intensity, duration? Dance 3 days/week → 10 hours/week
- Pain
  - Location: Outside aspect of hip
  - Timing: Increasing in duration
  - Characteristics (exacerbating/alleviating): Activity aggravates
  - Intensity (on a 10 point scale): 5/10 current, 9/10 today while walking
- Mechanical symptoms (catching, popping, locking)? Yes, it “snaps”
- Instability symptoms? No
- History of prior injuries? None
- Treatments trialed, and effectiveness? Not tried
- Functional limitations? Missed dance recently; does not miss school; does not wake from sleep
HOP-ROM-S

- Observation: No obvious swelling, redness, deformities
- Palpation: Tender over lateral thigh at greater trochanter of proximal femur
- Range Of Motion: Full and equal on both sides
- Strength: 5/5 on MMT; provocative on resisted hip abduction
- Specialized testing:
  - Trendelenburg = Negative
  - FABER = Negative
  - Ober = Provocative of pain
  - Thomas = Negative
Greater Trochanteric Bursitis

• Inflammation occurs in the lubricating sac located between the midpoint of the trochanteric process of the femur and the gluteus medius tendon/iliotibial tract
Epidemiology

• “One of the most common causes of hip pain in adults”
Etiology

Repetitive stress injury causing normally paper-thin bursal wall to thicken, fibrose, and gradually loses its ability to lubricate the outer hip.

Causes:

- Tight ITB
- Lumbar spine disease
- Leg length discrepancy
- SI joint disorders
- Knee and ankle problems
Signs and Symptoms

• Lateral hip pain over outer thigh
• Difficulty walking
Diagnosis

• Exam findings
  – Point tenderness
  – Positive Ober test

• Testing
  – Occasional diagnostic injection with local anesthetic +/- corticosteroid
  – No imaging needed
Treatment

- Conservative Measures
- Amenable to topical NSAIDs (ketoprofen, diclofenac)
- Physical therapy especially for Ober stretch
  - Can trial iontophoresis
- Occasional corticosteroid injection
Prognosis

• Very good
• Complications are rare
  • Persistence
Case #3 – Groin Pain

ID: 16-year-old male basketball player presents with his mother

CC: 3 weeks of left groin pain

PMHx: Subtle slipped capital femoral epiphysis (SCFE) diagnosed after physeal fusion at age 14. Responded well to physical therapy focused on iliopsoas.
SCFE

- Displacement of the capital femoral epiphysis (head) from the metaphysis (neck) through the physeal plate
  - Most commonly posterior/inferior
Klein’s Line
Epidemiology

• 1:10,000 to 1:1000 adolescents
• 1.5:1 male:female
  – ~ 13.5 years in males, 12 years in females (PHV)
• Slightly more common in African-Americans
• Bilateral 20%
• Unilateral L > R
  – 30-60% risk of subsequent contralateral slip
Etiology

• Risk factors
  – Obesity
  – Renal failure
  – Radiation and chemotherapy treatments
  – Genetic disorders
  – Endocrine abnormalities
    • Hypothyroidism
    • Growth hormone deficiency
Presumed Pathophysiology

- Occurs through hypertrophic zone of growth plate
- Strain of weight through “vertical” physis
- Slips into pure extension
- Amount of deformity much greater than appears on x-ray
Symptoms

• Nonradiating, dull, aching, chronic or intermittent pain in the
  – Hip, groin, trochanter → 50%
  – Knee → 26%
  – Thigh → 16%
  – Nonpainful limp → 8%

• Often no antecedent trauma

• Increases with physical activity

• Timing
  – Chronic (most common) > 3 weeks
  – Acute (10-15%) < 3 weeks
  – “Acute on chronic”
Signs

• Trendelenburg or antalgic (limp) gait
• Affected leg held in externally rotated position
  – May be shortened by 1-3 cm
Diagnosis

• Exam findings
  – Anterior hip tender to palpation (not knee)
  – Restricted **internal rotation**, abduction, and flexion
  – Hip passively flexed from extended position abducts and externally rotates

• Testing: BILATERAL lateral (frogleg) and AP pelvis x-rays
  – Consider TSH if height < 10\textsuperscript{th}ile
Treatment

• Goals:
  – Prevent further slip and deformity
  – Maintain adequate ROM

• Gold standard → *In situ* surgical pinning
  – Stable (nondisplaced, “preslip”): 24-72 hours
  – Unstable (displaced, unable to bear weight): within 24 hours
  – If in doubt, send to ER
Prognosis

• Risk of symptomatic osteoarthritis at age 50
  – Mild slip $\rightarrow$ ~ 5%
  – Moderate $\rightarrow$ ~10%
  – Severe $\rightarrow$ > 25%

• Complications
  – Avascular necrosis
  – Chondrolysis
HOP-ROM-S

• History: Insidious onset discomfort with activity, but no trauma; feels a “click”
• Observation: No obvious swelling, redness, deformities
• Palpation: Tender over anterior hip and groin
• Range Of Motion: Lacks passive flexion on the left
• Strength: 5/5 on MMT
• Specialized testing:
  – Trendelenburg = Negative
  – FABER = Suggestive; “FADIR” highly provocative
  – Ober = Negative
  – Thomas = Negative
FAI after SCFE
Femoroacetabular Impingement

NORMAL

CAM

PINCER

MIXED
Epidemiology

• First described in 1999
• “seems to account for a large proportion of previously undiagnosed cases of hip pain in young adults”
Etiologies

- SCFE
- LCP
- DDH
- Healed femoral neck fractures
Signs and Symptoms

• Persistent unexplained pain
• “Pinching” sensation
• Lack of or provocative flexion of the hip
Diagnosis

• Exam findings: Positive anterior hip impingement test =
  – Flexion
  – ADduction
  – Internal Rotation

• Testing
  – AP pelvis and cross-table lateral view, to measure “alpha angle”
  – May prove elusive, even on CT or MRI
  – Diagnostic arthroscopy advocated
Treatment

• “FAI surgery has evolved rapidly and at a pace far quicker than our understanding about the natural history and epidemiologic characteristics of the condition”

  but

• “the review literature appears to promote initial non-operative treatment for FAI”

Prognosis

• Too early to estimate
• Complications:
  – Major cause of acetabular labral tears
  – Long-term osteoarthritis of the hip
Acetabular Labral Tears
Epidemiology

• First reported in 1957
• Previously thought to be an uncommon injury, in some series
  – 22% of athletes with groin pain
  – 55% of patients with mechanical hip pain of unknown origin
• Mean time to diagnosis 2 years
• Female slightly > male
• Most frequently anterior labrum torn
Etiology

- High energy trauma
- FAI
- Capsular laxity/hip hypermobility
- Dysplasia
- Degeneration
Symptoms

• Anterior hip pain
• Groin pain
• Insidious onset
• Chronic dull pain with sharp exacerbations due to activity
• Clicking, locking or catching, giving way
Signs

- Perhaps limited ROM
Diagnosis

• Exam findings inconsistent
  – Positive FADIR

• Testing
  – Xray to rule out other conditions
  – MR arthrogram (60+% sensitive, 44+% specific) > MRI (only 30% sensitive, 36% specific)
  – Arthroscopy still considered gold standard
Treatment

• Relative Rest, Ice, NSAIDs
• Physical therapy for 10-12 weeks
• Fluoroscopically/ultrasound guided intra-articular injections
  – Diagnostic with local anesthetic
  – Therapeutic with corticosteroid
• Arthroscopic or open surgical resection or repair
Prognosis

• Short term studies generally favorable
  – As many as 73% continuing in athletics 1.5 years after surgery
  – Lack of long term data problematic for payors

• Surgical complications rare for arthroscopic procedures (1.5%)
Femoral Neck Stress Fracture
Epidemiology

• Runners, gymnasts, dancers, figure skaters
• Less common than
  – Tibia
  – Fibula
  – Metatarsal
  – Tarsal navicular
Etiology

- Repetitive overuse injury (fatigue fracture)
- Impaired skeletal resilience (fragility fracture)
- Leg length discrepancy (longer side)
Symptoms

• Groin pain; can be elusive to identify
• Signs
  – Limp associated with running
Diagnosis

• Exam findings
  – Often no specific abnormalities
  – Possibly positive “hop” test

• Testing
  – Xray may not be sensitive
  – Must maintain index of suspicion for MRI
Treatment

• Restrict activity until pain free
  – May need crutches for non or partial weight bearing
  – Very gradual return to activities

• Tension side fractures may need early pinning or bone grafting
Prognosis

• Generally good
• Complications
  – Nonunion (tension side)
  – Displacement
    • AVN
    • FAI
Iliac Wing Avulsion Fractures
Etiology

- Soccer players, sprinters
- Around peak height velocity
Symptoms

• Anterior hip pain
• Can radiate to groin if AIIS
Diagnosis

• Exam findings
  – Point tenderness over ASIS or hip flexor mass

• Testing
  – May need oblique hemi-pelvis view to visualize subtle avulsion
Treatment

• Short course partial weight bearing on crutches
• Prolonged period of limited activity
  – Fracture under tension
• Emphasis on iliopsoas flexibility in subsequent rehab to preclude recurrence
Complications

• Large displacement ➔ Surgical fixation
Take Home Points

- Localize to iliac wing/pelvis, hip joint, or thigh/proximal femur
- Painful and/or reduced internal rotation is concerning
- Image bilateral hips via AP pelvis with frog-leg lateral
Thank You!

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Physical examination reminders

HOP-ROM-S
Observation

- Deformities
- Tumor
- Discoloration – rubor, pallor, ecchymosis
Palpation

- Calor
- Dolor
- Pulses
- Sensation
- Point tenderness
  - Bone
  - Muscles
  - Joint line
Palpation Landmarks

**Bone**
- ASIS
- Iliac Crest
- Iliac Tubercle
- Greater Trochanter & Bursa
- Symphisis Pubis
- PSIS
- Ischial Tuberosity
- SI joint

**Soft Tissue**
- Inguinal ligament
- Sartorius Muscle
- Adductor Longus Muscle
- Inguinal nodes in femoral triangle
- Iliopsoas Muscle
- Rectus Femoris Muscle
- Gluteus Medius Muscle
- Gluteus Maximums Muscle
- Hamstring Muscle Group
Range of Motion (ROM) Norms

In neutral (anatomic) position

- Flexion: 120°
- Extension: 30°
- ABduction: 45-50°
- ADDuction: 20-30°
- Internal rotation: 35°
- External rotation: 45°

At 90° flexion

- ABduction: Closer to 90°
- ADDuction: Closer to 15°
- Internal rotation: 35°
- External rotation: 45°
Strength Testing

• Manual Muscle Testing
  – 1/5 = Minimal contractility
  – 2/5 = Complete ROM with gravity eliminated
  – 3/5 = Complete ROM against only gravity
  – 4/5 = Complete ROM against gravity and some resistance
  – 5/5 = Complete ROM against gravity and can overcome resistance