Update on Hip Pain in Athletes

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Anatomy

- Bones
  - Ilium, ischium, pubis
- Ligaments
  - Iliofemoral, pubofemoral, ischiofemoral
- Capsule/labrum
- Nerves
  - Sciatic, femoral, obturator
- Muscles
  - Numerous

Background

- Traditionally difficult to diagnose/treat
  - Many structures around the hip
  - Mechanism of injury/pain/presentation can be similar for multiple conditions
- Chronic symptoms = poorer outcomes
- Hip pain can be caused by non-musculoskeletal conditions
  - Hernia, lumbar pain/radiculopathy

Background

- Intra-articular pain can come from cartilage, bone, labrum, ligamentum teres
- Lateral femoral cutaneous nerve exits beneath inguinal ligament near ASIS
  - Numbness of lateral thigh
- Sciatic exits deep to piriformis
  - Posterior hip pain, posterior thigh pain

Sports Hernia

- Also called “athletic pubalgia”
- Broad spectrum of injuries involving the inguinal ligament, conjoined tendon, transversalis fascia, internal oblique muscle, external oblique muscle, and rectus abdominis insertion
- Postulated to occur from imbalance of strong adductors vs. weaker abdominal muscles
  - Leads to weakening and tearing of structures of pelvic floor

Sports Hernia

- Patients complain of exertional pain in pubic area
- May radiate into groin or inner thigh
- Males > females
- Usually due to hyperextension mechanism
- Common in soccer, hockey
- Usually see several docs before diagnosis

Physical Exam
Tenderness along inguinal ring or conjoined tendon
May have tenderness on pubic tubercle, symphysis or adductor origin
Palpable abdominal defect is rare
May have tight hamstrings or limited hip motion
Pain with resisted sit-ups and hip adduction

Imaging
- Limited (no specific imaging)
- X-rays nondiagnostic, bone scan may show uptake at pubic symphysis (may be confused with osteitis pubis)
- Only 12% have positive MRI findings
  - Mostly abnormalities of rectus insertion
  - Adductor longus inflammation
    - Symphysis edema

Treatment
- Start conservative
- Rest, ice, NSAIDS, P.T., maybe steroid injection
- Surgery includes re-attachment of distal rectus
- Imbrication of transversalis fascia
- Release adductor epimysium to increase length
- Sometimes mesh

Osteitis Pubis
- Very similar to sports hernia
- Inflammation of pubic symphysis
- Cause uncertain
- Possibly overuse of adductors and gracilis origins
- Some believe imbalance of abdominal wall muscles vs. adductors
- Possible AVN, fatigue fracture
- Often due to kicking, running sports
- Pain located at symphysis
- May radiate to groin, medial thigh, abdomen
- Pain with passive abduction or resisted adduction

Imaging
- X-rays are normal early
- Will ultimately show bone resorption or widening of symphysis
- Bone scan shows increased uptake

Treatment
- Nonoperative treatment successful 90-95%
- Rest, activity modification, NSAIDS, P.T., steroid injection
- P.T. to focus on modalities, core strengthening, adductor stretching, muscle balance
Femoroacetabular Impingement

- Abnormal contact between proximal femur and acetabulum
- Leads to damage to labrum, cartilage, acetabular rim, femoral neck
- Classified as Cam, Pincer, or Combined
- New type recently described—Subspine

Causes—Legg-Calve-Perthes, SCFE, trauma, idiopathic
Presents as vague/variable pain
  - Usually in groin, especially with hip flexion
  - Stiffness
  - Start-up pain
  - Labral tear
  - Progresses to arthritis in older individuals

- Cam type
  - Femur-based
    - Increased offset at head-neck junction
    - Abnormally shaped head or osteophytes on head-neck junction
    - Creates damage to labrum, cartilage on acetabular rim on extremes of motion
- Pincer type
  - Acetabulum-based
    - Poor anteversion, osteophytes or overly deep
    - Acetabular rim abuts femoral neck at extremes of motion
    - Loads acetabular rim, labrum, cartilage
- Combined type accelerates damage

Physical exam demonstrates groin pain with hip flexion, internal rotation, adduction (impingement test)
May have decreased motion during test

Imaging
  - Xrays diagnostic
    - Can see osteophytes, acetabular retroversion
    - “crossover sign”
    - “pistol grip deformity”
  - 3D CT reconstructions
  - MRI

Treatment
  - Surgical if symptomatic
  - Limited value of conservative treatment
  - Arthroscopic vs. open
  - Goal is to normalize anatomy
    - Resect bony prominences, debride/repair labrum, address chondromalacia

- Typically takes 3 years and 4 healthcare providers to make diagnosis
• 13% of patients have inappropriate surgery prior to diagnosis
• FAI will ultimately lead to hip arthritis
• Controversy on what to do with asymptomatic patient with FAI...

Subspine Impingement
• Described in 2008
• Due to prominent AIIS abutting base of femoral neck during deep hip flexion
• Creates deep groin pain
• Causes—AIIS avulsion fracture/malunion, developmental, prior pelvic osteotomy

Imaging
  o Xrays will demonstrate AIIS
  o MRI will show edema at base of femoral neck
    ▪ Treatment is resection—open versus arthroscopic
  o More accurate diagnosis
    ▪ 3T MRI
    ▪ MRI arthrogram
    ▪ 3D CT reconstructions
  o Better treatment options
    ▪ Arthroscopy instruments
    ▪ Positioning systems
    ▪ Experience

Labrum Tears
• Fibrocartilage ring around acetabulum
• Most common intra-articular pathology of hip
• Causes
  o Hip dysplasia = large floppy labrum
  o Trauma
  o Capsular laxity/hypermobility
  o FAI

• Presents as pain in the groin with twisting/pivoting
• Can have clicking/snapping (snapping hip)
• Flexion/internal rotation reproduces pain

• Xrays- may show FAI, DJD, dysplasia, trauma
• MRI arthrogram = 92% sensitive
• Higher power noncontrast MRI good too

Treatment
  o Conservative treatment = poorer outcomes
  o P.T., activity modification, steroid injections may give temp. relief
Arthroscopy is best option if no DJD
  - Debridement vs. repair

**Snapping Hip**
- Also called coxa saltans
- Can be caused by several pathologic processes
- Audible snap with certain movements
- Classified as external, internal, intra-articular

- Usually late teens/early 20’s
- External most common
  - Thickening of IT band from repetitive microtrauma
- Internal
  - Iliopsoas snapping over femoral head/iliopectineal eminence

- Intra-articular
  - Labral tears, loose bodies, osteochondral injuries
- Imaging not very helpful
- Intra-articular usually surgical
- External and internal—start conservative
  - P.T., NSAIDS, activity modification
- Surgery
  - IT band release for external snapping hip
  - Iliopsoas lengthening or release for internal snapping hip
  - Open or endoscopic

**Contusions**
- Common injury around the hip
- Collisions or falls
- Superficial or deep, sometimes form hematoma
- NSAIDS, heat, P.T., rest/activity modification
- Goal is maintain ROM and muscle strength

- Most common is iliac crest = hip pointer
- Watch out for myositis ossificans
  - Especially thigh
- Watch out for avulsion fractures in skeletally immature
  - ASIS, AIIS, ischium, lesser trochanter
- Mostly treated nonsurgically

**Stress Fractures**
- Pelvic stress fractures more common than femur
- Repetitive submaximal loading of bone
- Bone resorption > bone formation
- Higher risk with osteopenia, coxa vara
- Pubic rami, sacrum, femoral neck

Femoral neck
- Vague pain in groin with running
- Progressively worse
- Xrays won’t show early
- MRI/bone scan
- Tension side (superior) and compression side (inferior)
- Tension side or displaced fractures are operative
- Nondisplaced compressive side = limited weight bearing 6-12 weeks
- Risk of AVN with displacement

Bursitis
Trochanteric
- More common in females
- Can lead to IT band syndrome

Ischial
- Between hamstrings and ischial tuberosity

Iliopsoas
- Between iliopsoas and pelvic brim

Strains
- Common around the hip
- Forceful contraction of stretched muscle or eccentric contraction
- Mostly at musculotendinous junction
- More often muscles that cross two joints
- Watch for avulsion fractures in skeletally immature

Thank You