MY THIGH AND GROIN HURT. WHAT HAS MY ATHLETE GOT?

Sharon L. Hame, MD
Professor of Clinical Orthopaedic Surgery
Associate Team Physician, UCLA
David Geffen School of Medicine at UCLA
Los Angeles, CA
DISCLOSURES

• Board Member FORUM, a women’s orthopaedic sports medicine society
• Institutional Support for Fellowship
  • Smith & Nephew
  • Storz
OBJECTIVES

1. Identify the causes of groin and thigh pain
2. Learn how to evaluate an athlete with groin and thigh pain
INTRODUCTION AND OUTLINE

• Evaluation of athletes with groin and thigh pain is complex and may involve multiple disciplines.

• Groin Pain has been reported to account for 6% of all athletic injuries.
  - Minnich, et al AJSM 2001

• In athletes with chronic groin pain, 27-90% were found to have co-existing pathologies.

• Case
• Causes of thigh and groin pain in athletes
• History
• Physical examination
• Diagnostic testing
• Case
CASE

The patient is a 22 year old male water polo player with a 4 year history of bilateral groin pain, R > L. The pain can radiate down the thigh. No posterior hip pain. No trauma or inciting event. He has some clicking and catching. No neurologic symptoms. He has tried treatment in the training room and anti-inflammatory medication.
PHYSICAL EXAMINATION

Tender: groin
ROM: FF 110  Int Rot 5  Ext Rot 40
Strength: 5/5 in all planes
+ FADDIR
- FABER
- Log Roll
+ Dynamic internal rotary impingement
- Ober test
+ Thomas Test (hip flexor tightness)
MRI ARTHROGRAM
CAUSES OF THIGH AND GROIN PAIN IN THE ATHLETE

• Thigh pain
  • Stress Fracture
  • Quadriceps strain
  • Quadriceps contusion
  • Meralgia Paresthetica
    • Lateral femoral cutaneous nerve, ventral rami (L2,L4)
  • Tumor

• Groin Pain
  • Hip labral tear
  • Femoral acetabular impingement (FAI)
  • Groin strain/pull
  • Hip pointer
  • Hip flexor strain
  • Hip Arthritis
  • Stress fracture/hip/pubic rami
  • Hip fracture
  • Iliopsoas tendinitis/snapping hip
  • Inguinal hernia
  • Sports hernia
  • Osteitis Pubis
  • Psoas muscle abscess
  • Avascular necrosis of the hip
  • Avaphyseal injuries
  • Tumor
  • Hip dislocation
  • Hip instability
  • Slipped Capital Femoral Epiphysis (SCFE)
  • Hip dislocation
  • Synovial Chondromatosis of the hip
  • Perthes disease
  • Spine issues
  • Intra-abdominal/GI
  • Genitourinary

• Other Hip Pain
  • Trochanteric bursitis
  • Snapping hip
  • Gluteus medius/minimus tears
  • Nerve entrapment:
    • Genitofemoral (L1, L2, L3)
    • Iliohypogastric (T12, L1)
    • Ilioinguinal (T12, L1)
    • Obturator
    • Pudendal
ANATOMY

- Femoral head is mostly covered by articular cartilage
- Acetabulum is covered by articular cartilage peripherally with a non-articular central floor
- The **ligamentum teres** arises from the tranverse acetabular ligament and attaches to the central femoral head
- Three major ligaments surround the hip joint
  - The **iliofemoral ligament of Bigelow** lies anteriorly and has an inverted Y-shape
  - **Pubofemoral ligament** covers the inferior and medial aspect of the hip joint capsule
  - **Ischiofemoral ligament** lies posteriorly
ANATOMY

- The **labrum** is a fibro-cartilaginous structure which runs around the periphery of the acetabulum.
- The peripheral 1/3 of the labrum has a rich blood supply.
- Pain fibers are concentrated anteriorly and anterosuperiorly.
- The labrum provides an additional stabilizing force for the hip joint:
  - It increases the acetabular volume by 33%.
  - It helps to create negative articular pressure which provides additional stability to the hip.
Cutaneous innervation of the lower abdomen, hip and portions of the thigh

HISTORY

- **Mechanism of Injury**
  - Traumatic vs. Atraumatic

- **Timing of onset**
  - Acute vs Chronic

- **Inciting activities/movements**
  - Weight bearing activities
  - Twisting activities
  - Sitting

- **Location of Pain**
  - Groin
  - Anterolateral
  - Lateral
  - Posterior
  - Radiating

- **Quality of Pain**
  - Burning

- **Associated symptoms/Other injuries/Surgeries**
  - Low back pain/radiculopathy
  - Abdominal pain
  - Knee pain
  - Clicking/catching/popping
  - Instability
  - Previous lower extremity injuries

- **Use of orthotics**
- **History of physical therapy and other treatments**
- **History of injections**
- **Medication use**
- **History of hip dysplasia or other hip issues as a child (SCFE, LCP)**
PHYSICAL EXAMINATION

• **Inspection**
  - Gait
    - Antalgic
    - Trendelenberg
  - Overall alignment
    - Varus/Valgus
    - Pes planovalgus
    - Leg length discrepancy
  - Symmetry
  - Scoliosis
  - Soft tissue swelling
  - Obvious deformity/mass
  - C-sign

• **Palpation**
  - Groin
  - Hip flexor
  - Greater trochanter
  - Posterior/Gluteals/Piriformis/SI/low back
  - Abdomen
  - Thigh/Quadriceps/Adductors
PHYSICAL EXAMINATION

- **Hip, knee & lower extremity ROM**
  - Hip flexion 0-120
  - Hip extension 0-30
  - Abduction/Adduction 0-45/0-30
  - Internal rotation/external rotation 0-45

- **Hip, knee & lower extremity strength**
  - Hip flexion/Ext/Abd/Add
  - Quadriceps
  - Hamstrings
  - Calf
    - Walking on heals and toes
PHYSICAL EXAMINATION

- **Low back examination**
- **Special Testing**
  - **Anterior Impingement Test (FADDIR)**
    - Flexion, Adduction, internal rotation
    - Indicates anterior hip joint pathology
  - **Posterior Impingement Test**
    - Extension, abduction, external rotation
PHYSICAL EXAMINATION

- **Dynamic External Rotary Impingement**
  - Supine
  - Contralateral hip at 90 degrees Flexion
  - Hip flexed to 90 degrees
  - Taken through wide arc of abduction/external rotation
  - Pain=FAI/Labral tear
- **Dynamic Internal Rotary Impingement**
  - Supine
  - Contralateral hip at 90 degrees Flexion
  - Hip flexed to 90 degrees
  - Taken through wide arc of abduction/internal rotation
  - Pain=FAI/Labral tear
- **FABER (Patrick’s test)**
  - Differentiate b/w SI, hip and lumbar pain
  - If creates groin pain, may be associated with a labral tear/FAI
- **Iliopsoas Testing**
  - Hip abduction, flexion then internal rotation and extension
- **Thomas Test for hip flexor tightness**
PHYSICAL EXAMINATION

- **Ober’s Test for IT band tightness**
  - Lateral position, contralateral hip flexed
  - Ipsilateral hip extended with knee flexed
  - Assesses adduction-below neutral normal

- **Log roll**
  - Passive
  - Roll hip externally & internally
  - May indicate irritation or inflammation of the hip

- **Trendelenberg Test**
  - Test strength of gluteus medius/minimus
  - Patient stands and lifts one leg
  - Any dropping of the pelvis toward the lifted leg indicates weakness or tear
PHYSICAL EXAMINATION

- Thorough Neurological examination
- Gastrointestinal examination
- Gynecological/Genitourinary examination
DIAGNOSTIC TESTING

- **Radiographs**
  - Hip, pelvis and Femur
    - AP/Lat hip, AP Pelvis
  - Special radiographs
    - False profile
RADIOGRAPHIC MEASUREMENTS

- **Alpha angle** (more often done on MRI)
  - CAM lesion
- **Center edge angle** (>25 normal)
  - Pincer lesion
  - Dysplasia
- **Crossover sign**
  - Acetabular version
DIAGNOSTIC TESTING

• **Magnetic Resonance Imaging**
  - Pelvis
    - Stress fractures
    - Osteitis pubis/sports hernia
    - Tendinitis/muscle strains
    - Any other pelvic pathology
  - Hip
    - Stress fractures
    - Tendinitis/Muscle strains
  - Femur
    - Stress fractures
    - Myositis Ossificans
    - Tendinitis Muscle strains and tears
      - Hamstring
      - Quadriceps
    - Tumors

Beware of the non-traumatic, thigh mass
DIAGNOSTIC TESTING

- **MRI Arthrogram of the Hip**
  - Labral tears
  - FAI
  - Loose Bodies
  - Ligamentum Teres tears
- **Alpha Angle**
  - >50 degrees abnormal
DIAGNOSTIC TESTING

MRI of the Lumbar Spine
DIAGNOSTIC TESTING

- **Ultrasound**
  - Pelvis
  - Hip
    - Dynamic examinations
      - Snapping hip syndrome
        - Iliopsoas
        - Greater Trochanter

- **CT Scan**
  - Boney abnormalities
    - FAI
      - CAM
      - Pincer

- **EMG/Nerve Conduction Study**
  - Nerve entrapment
  - Lumbar radiculopathy
DIAGNOSTIC TESTING

- **Injection**
  - Diagnostic and Therapeutic
  - With or without corticosteroid
    - Hip joint
    - Iliopsoas
    - Greater trochanter
DIAGNOSTIC TESTING

- **Laboratory Studies**
  - Ordered based on clinical picture
- **Infection**
  - Complete blood panel
  - CBC with differential
  - ESR
- **Other tests to consider**
  - Rheumatoid Factor
  - HLA B27
  - Urinalysis
  - Pregnancy Test
GROIN PAIN RELATED MUSCULOSKELETAL ISSUES

Algorithm for diagnosis of groin pain radiating buttocks & distally

Algorithm of groin pain radiating to the knee

NON-MUSCULOSKELETAL GROIN PAIN

Algorithm for diagnosis of groin pain related to the abdomen and dysesthesia

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DIAGNOSIS

- Femoral Acetabular Impingement with Anterior Superior Labral Tear
TREATMENT

Hip arthroscopy, labral repair and Femoral osteoplasty
SUMMARY

- The differential diagnosis for groin pain is lengthy and complex.
- Athletes may have multiple sources of pain
- Complete history and physical examination as well as diagnostic testing is important in evaluating an athlete with groin pain.


THANK YOU!