The Evaluation of Hip pain in the Athlete

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Disclosures

I have the following relevant financial relationship with a commercial interest to disclose:

Speaker - Arthrex
Consultant - Mitek
The hip is a very difficult area to diagnose pathology

- Complex anatomy and infancy of understanding its pathology
- Most of us are not taught an adequate examination of the athletic hip

Critically evaluate yourself

Performance
Constant learning and improving
This is a skill, practice yields better results
Athletes of any age?
History of the injury, or chronic?

Athlete vs NON-Athletic Team Doc

Athletic Injury vs Helping an Athlete with an injury!!!
History

Birth / Family

Problem - When did it start
• Duration is important
• Effect on daily life

Key Symptoms
• Activity
• Rest
• Sitting/ in and out of car/ Stairs/
• Sex life

Onset
• Traumatic
• Insidious
• Both

Symptomatic Relief
• NSAIDS
• Rest
• PT
History

Location of the Pain when it occurs?
• Groin
• Lateral
• Medial
• Anterior
• Posterior

Other Concerns or Etiologies
• Spine
• Leg
• Knee
• Intra abdominal
• OB/ Gyn
Now adjust your differential Diagnosis

Please remember- How Many PCP /PT’s / Orthopods have they seen before looking to you for answers!

<table>
<thead>
<tr>
<th>Intra-Articular</th>
<th>Extra-Articular</th>
<th>Hip Mimickers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labral tears*</td>
<td>Iliopsoas tendinitis*</td>
<td>Athletic pubalgia</td>
</tr>
<tr>
<td>Loose bodies*</td>
<td>Iliotibial band*</td>
<td>Sports hernia</td>
</tr>
<tr>
<td>Femoroacetabular impingement*</td>
<td>Gluteus medius or minimas*</td>
<td>Osteitis pubis</td>
</tr>
<tr>
<td>Capsular laxity*</td>
<td>Greater trochanteric bursitis*</td>
<td></td>
</tr>
<tr>
<td>Ligamentum teres rupture*</td>
<td>Stress fracture</td>
<td></td>
</tr>
<tr>
<td>Chondral damage*</td>
<td>Adductor strain</td>
<td></td>
</tr>
<tr>
<td>*Condition can be treated arthroscopically.</td>
<td>Piriformis syndrome*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sacroiliac joint pathology</td>
<td></td>
</tr>
</tbody>
</table>
AAOS OKU Sports Med 2 “Groin Pain in the Athlete” (courtesy jovan laskovski)

Athletic Pubalgia
- Rectus abdominus insertion with pain in inguinal canal
- Adductor longus inflammation, microtearing at the insertion upon the pubic ramus

Adductor (Groin) Strain

Piriformis Syndrome

Hamstring Syndrome
- Pain overlying ischial tuberosity

Snapping Hip
- Iliopsoas gliding over iliopectineal eminence or femoral head
- IT band over greater troch
- Biceps over ischial tuberosity
- Iliofemoral ligaments over femoral head
Contusion
Hip pointer (ASIS)
Bursitis
Fractures
  Stress
    Pelvis
    Femoral neck
Apophyseal avulsion (ASIS, AIIS, Ischial tuberosity
  Traumatic
  SCFE
Intra-articular pathology
  – Synovitis
  – Loose bodies
  – Labral tears
  – AVN
  – DJD
Femoroacetabular Impingement
AIIS/Subspine Impingement
Adhesive Capsulitis of Hip
Now What???
Imaging

Xrays
MRI
CT
US

(In an Athlete) Typically- Imaging NOT for diagnosis! But helpful for planning, and ruling things out

• Example- FAI Morphology vs FAI Pathology
• FAI is not a cause of pain, it is a condition that predisposes the hip to painful intraarticular pathology
MRI

Arthrogram vs non contrast

Diagnostic Accuracy of Clinical Assessment, Magnetic Resonance Imaging, Magnetic Resonance Arthrography, and Intra-articular Injection in Hip Arthroscopy Patients


Conclusion
- Non Contrast MRI had 42% false negative
- Arthrogram MRI had 20% false positive
- Intraarticular injection had >90% accuracy accounting for both, but didn’t necessarily correlate with intra-articular findings

My preferred approach
- MRI arthrogram with anesthetic (no steroid) (pain relief?)
- Separate intraarticular steroid injection prn document in note pain relief
- If injection relieved pain, we can reliably say that there is some articular derangement (but what is it???)
- We can not definitively address all intraarticular pathology arthroscopically (OA etc)

(as discussed with Laskovski, 2017)
Clinical Presentation of Patients with Symptomatic Anterior Hip Impingement

John C. Clohisy MD, Evan R. Knauz DO, Devyani M. Hunt MD, John M. Lesher MD, Marcie Harris-Hayes PT, Heidi Prather DO

Published online: 7 January 2009
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Fig. 1 Pain location and frequency for patients with symptomatic FAI is shown.

- Lateral Hip: 67% (37 patients)
- Low Back: 23% (12 patients)
- Buttock: 29% (15 patients)
- Posterior Thigh: 12% (6 patients)
- Anterior Thigh: 35% (18 patients)
- Knee: 27% (14 patients)
- Groin: 88% (46 patients)
FADIR (FADDIR). FABER, SCOUR, IROP, DIRI, McCarthy Test, Foveal, Thomas, Stinchfield, Log roll, Trendelenberg, UGHH!
### Validity (courtesy Jovan Laskovksi)

#### TABLE 4. Continued

<table>
<thead>
<tr>
<th>Author (Year of Publication)</th>
<th>Study Population</th>
<th>Diagnoses Made by Authors</th>
<th>Reference Standard Used to Confirm or Discard Diagnosis</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>LOR+</th>
<th>LOR−</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSLR test/Stitchfield test Clohisy et al.²⁹ (2009)</td>
<td>N = 51 (53 hips); mean age, 35 yr (range, 15-61 yr)</td>
<td>Symptomatic FAI in combination with radiographic labral pathology</td>
<td>Clinical diagnosis with radiography</td>
<td>0.56</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Troelsen et al.³⁰ (2009)</td>
<td>N = 18 (16 women/2 men); median age, 43 yr (range, 32-56 yr)</td>
<td>Labral pathology</td>
<td>MRI-A</td>
<td>0.06</td>
<td>1.0</td>
<td>0</td>
<td>0.94</td>
<td>1.0</td>
<td>0.06</td>
</tr>
<tr>
<td>Maslowski et al.³¹ (2010)</td>
<td>N = 50; mean age, 60.2 yr (range, 22-84 yr)</td>
<td>Labral tear, FAI</td>
<td>80% improvement of pain on 10-cm VAS after intra-articular hip injection or 80% pain relief</td>
<td>0.75</td>
<td>0.38</td>
<td>1.21</td>
<td>0.66</td>
<td>0.19</td>
<td>0.89</td>
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<tr>
<td>Log-roll test Clohisy et al.²⁹ (2009)</td>
<td>N = 51 (53 hips); mean age, 35 yr (range, 15-61 yr)</td>
<td>Symptomatic FAI in combination with radiographic labral pathology</td>
<td>Clinical diagnosis with radiography</td>
<td>0.30</td>
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<tr>
<td>Posterior impingement test Clohisy et al.²⁹ (2009)</td>
<td>N = 51 (53 hips); mean age, 35 yr (range, 15-61 yr)</td>
<td>Symptomatic FAI in combination with radiographic labral pathology</td>
<td>Clinical diagnosis with radiography</td>
<td>0.21</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**NOTE.** Data are arranged per test and then per study. Therefore some studies are cited more than once. Tests with several names but the same execution are presented in 1 row; the names are divided by virgules.

Abbreviations: MRI, magnetic resonance imaging; MRI-A, magnetic resonance imaging-artrograph; NA, not applicable (data were not calculated in study and/or could not be calculated based on available figures); VAS, visual analog scale.

#### TABLE 5. Overview of Included Studies With Corresponding Level of Evidence

<table>
<thead>
<tr>
<th>Author (Year of Publication)</th>
<th>Test Description or Diagnostic Accuracy Study</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazy et al.²⁹ (2006)</td>
<td>Test description</td>
<td>V</td>
</tr>
<tr>
<td>Domb et al.³² (2009)</td>
<td>Test description</td>
<td>V</td>
</tr>
<tr>
<td>Frechill and Safian³³ (2011)</td>
<td>Test description</td>
<td>V</td>
</tr>
<tr>
<td>Martin et al.¹⁴ (2006)</td>
<td>Test description</td>
<td>V</td>
</tr>
<tr>
<td>Martin et al.³³ (2010)</td>
<td>Test description</td>
<td>IV</td>
</tr>
<tr>
<td>Martin et al.³⁰ (2010)</td>
<td>Test description</td>
<td>II</td>
</tr>
<tr>
<td>Plante et al.³⁰ (2011)</td>
<td>Test description</td>
<td>V</td>
</tr>
<tr>
<td>Burnett et al.³⁰ (2006)</td>
<td>Accuracy</td>
<td>II</td>
</tr>
<tr>
<td>Clohisy et al.²⁹ (2009)</td>
<td>Accuracy</td>
<td>II</td>
</tr>
<tr>
<td>Fitzgerald³⁴ (1995)</td>
<td>Accuracy</td>
<td>II</td>
</tr>
<tr>
<td>Hase and Ucc³⁵ (1999)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
<tr>
<td>Martin et al.² (2008)</td>
<td>Accuracy</td>
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<tr>
<td>Maslowski et al.³⁴ (2010)</td>
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<td>III</td>
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<tr>
<td>Narvani et al.³⁶ (2003)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
<tr>
<td>Nogier et al.³⁶ (2010)</td>
<td>Accuracy</td>
<td>IV</td>
</tr>
<tr>
<td>Philippon et al.³⁷ (2009)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
<tr>
<td>Santori and Villar³⁸ (2000)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
<tr>
<td>Sink et al.³⁸ (2008)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
<tr>
<td>Troelsen et al.³⁹ (2009)</td>
<td>Accuracy</td>
<td>III</td>
</tr>
</tbody>
</table>

**NOTE.** The second column describes whether the researchers described tests (test description) and, if so, investigated the diagnostic accuracy and validity of the tests (accuracy).
Gait Analysis

Walking into exam room (often impossible to time, MA bringing patient in, you are in a room with someone else, etc.)

Me- Usually at end of exam

Antalgic-
• Shortened stance phase due to Pain
• Recent injury? (strain, trauma, dislocation, fracture)
• Chronic (AVN, OA, WC)

Trendelenberg-
Tendelenberg Gait

Abductor weakness, Deconditioning, SGN injury....other

Placing weight on the affected side = drop in the CONTRA-LATERAL hip
ROM

IR- >25-30
ER- >40

Flexion - >120 (actually 90?)
Carlos Guanche’s Pearls!

Increased IR and decreased ER =
  Increased femoral anteversion
    Psoas Impingement
    Posterior Trochanteric Impingement
    Dysplasia

Decreased IR and increased ER =
  Femoral retroversion
    Relative Cam-type impingement
    Anterior Trochanteric Impingement

• Globally decreased ROM =
  – Advanced OA
  – Adhesive capsulitis
Anterior and Medial

Osteitis Pubis
 Typically direct palpation can elicit symptoms but it can mimic athletic pubalgia closely

Athletic Pubalgia
 Sustained situp with heels off table
 Palpate origin of adductors and origin of rectus abdominus

Inguinal hernia evaluation
 Ask about coughing, sneezing, Valsalva

Stress fractures
 Femoral neck
 Pubic Rami
 No reliable physical exam tests, history will provide a better clue

MRI gold standard for evaluation
Internal Snapping (Iliopsoas, calcific rectus tendonitis, )

Reproduction on Circumduction Exam ("Snapping" normal finding in >10% population)
Patient will say “my hip is popping out of socket”
Elicited in hip extension with dynamic internal and external rotation
-many can do it for you

Good generalizations exist regarding snapping hip syndromes. If you can hear it from across the room it is the iliopsoas tendon, and if you can see it from across the room it is the iliotibial band.

**External Snapping/ ITB snapping**-

**Flexion / extension of slightly adducted hip**
Helpful intra-op to verify appropriate release
Log Roll
Anterior Impingement FADDIR (FADIR)

Flexion ADDuction Internal Rotation – recreates pain, indicating anterolateral hip pathology
"C" sign (history from patient, or examiners question during physical)
Sitting Pain
FABER

Flexion / Abduction / ER

Posterior pain = SI

Anterior / Deep lateral pain = intra-articular / Psoas pathology

Increased distance from the table to the lateral knee = Impingement / tight psoas
McCarthy Test

- Contralateral hip in Flexion
- Affected Hip in flexion and brought into/ extension “painful click”
- Reproduces Typical groin pain
- Intra-articular pathology
Butterfly Goalie Test

- Hip flexion / abduction / IR
- Position for Hockey Goalies
- Antero-superior / Posterior Impingement
Scour (Hip Quadrant test)

Hip flexed 90, adducts, axial load and rotation. Abducts and similar with adding full flexion and extension ROM as well

- Labrum
- Capsulitis
- OCD
- Acetabular defects
- OA
- AVN
- FAI
- Sensitivity- .62-.91
- Specificity- .43 -.75
Lateral (peritrochanteric space)

Iliotibial Band

External Snapping Hip

Greater Trochanteric Pain Syndrome
  Recalcitrant Trochanteric Bursitis
  Gluteus Medius Tears
  Gluteus Minimus Tears
Lateral Trocanteric Bursitis/ GTPS

Simple palpation of the lateral and posterior trochanter will elicit pain

This will NOT rule out other concomitant pathology

The initial pathology usually occurs in the tendons attached to the greater trochanter. The adjacent bursae are secondarily involved.

Gordon EJ, 1961
Posterior Piriformis Syndrome

Pain in the posterior sciatic notch

Can be elicited by deep tenderness to palpation in the region

Patient lays supine with knee and hip slightly flexed and foot lateral to contralateral knee

Resisted abduction/ER can elicit pain along with direct palpation while providing resistance

Very difficult to isolate muscle without engaging other muscles
Beighton’s Hypermobility (total score 9)

Bilateral point: (8 points)
Knee hyperextends >10, 5th digit hand >90, thumb to forearm, elbow hyperextends >10,

Palms to floor (1 point)
Ischiofemoral Impingement (IF)

Introduction

Ischiofemoral impingement (IFI), an uncommon source of hip pain, is defined as the entrapment of the quadratus femoris between the lesser trochanter and the ischium and has only recently been described in the literature [10]. While there are reports diagnosing this entity, the cause and treatment are still lacking.
**Ischiofemoral Impingement Test**

Affected hip is passively taken into hyperextension with 0 abduction.

Positive test= Hip then taken into hyperextension with abduction without pain.

(is fixing this just a “cool” surgery in search of a diagnosis???)
Case 1 (Right hip)

18yo Female college soccer goalie (5’7”, 145lbs)
-3 years of hip pain and “popping”- worsening
-Trouble running, even straight in line running
-Atraumatic sensation of “popping’ causing pain, sees and hears “Pop”
- Episodes - dozens per day. Feels unstable in hip, trouble playing her sport (no longer practices, just plays games)

TX:
PT, Rest, Injections (hip joint, and iliopsoas), multiple evaluations with Hip doctors including Ultrasound evaluations. MRI reported by patient and mother as “small labral tear the doctor said might need surgery in a few years”

Presents for 2nd opinion
Diagnosis?
Any more tests?
Plan??
Dysplasia and instability – Another topic for another time! A whole group of lectures!!!

But Your physical exam starts with a good history and listening to the patients complaints, not the imaging results. Use the entire story together to come up with a diagnosis and plan
Conclusion

• Exam Starts with the history
• Exam used to help determine appropriate differential diagnosis, further Imaging, proper treatment plan
• There are many different exams, learn them and use what works for you and the patient
• Listen to the patients, their story will guide your exam
• Think about non-“hip” etiologies of the symptoms (spine, sports hernia, OB/Gyn, secondary gain, etc)
• Always improve today on what we did yesterday
Thank You!!!