

Session ID: F253

## FEMOROACETABULAR IMPINGEMENT (FAI) – SIMPLIFIED

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## FACULTY/PRESENTER DISCLOSURE

- Faculty: Dr. Mark Leung
- Relationships with financial sponsors: None
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  - Other: None

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## OBJECTIVES

- Define femoroacetabular impingement (FAI)
- Create an approach to hip pain
- Recognize patients that may have FAI and review the approach to their diagnosis and treatment

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## WHAT IS FAI?

- Abnormal hip shape → bony rubbing → cartilage +/- or labral tear → potentially early-onset OA
- “Ne wish” clinical entity – Ganz et al, 2003
- 2016 Warwick Agreement on FAI Syndrome: An International Consensus
- FAI-CAM, Pincer, Mixed
- FAI (20% young adults)
  - Mostly asymptomatic
  - Only 23% have FAI SYNDROME
  - Early intervention may reduce OA progression



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## DIAGNOSIS OF FAI SYNDROME?



Image from Gifford et al, 2015  
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## FAI SYNDROME

**Symptoms**

The primary symptom of FAI syndrome is motion-related or position-related pain in the hip or groin. Pain may also be felt in the back, buttock or thigh. In addition to pain, patients may also describe clicking, catching, locking, stiffness, restricted range of motion or giving way.  
 Level of agreement: mean score 9.8 (95% CI 9.6 to 10).

Is pain arising from hip joint? Role of image guided (x-ray or ultrasound) injection

Those seeking severe symptoms, affecting ADL's

Affects young, economically active individuals → significant and lasting cost burden on individual and society


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## FAI SYNDROME

**Clinical signs**

Diagnosis of FAI syndrome does not depend on a single clinical sign; many have been described and are used in clinical practice. Hip impingement tests usually reproduce the patient's typical pain; the most commonly used test, flexion adduction internal rotation (FADIR), is sensitive but not specific. There is often a limited range of hip motion, typically restricted internal rotation in flexion.  
*Level of agreement: mean score 9.9 (95% CI 9.7 to 10).*

Movement patterns associated with FAI syndrome may lead to pain or dysfunction in other regions  
 Muscles around hip are weak in FAI syndrome  
 Impingement testing must reproduce patient's familiar pain  
 Essential to examine L-spine, hip, and groin for other structures that can produce similar pain



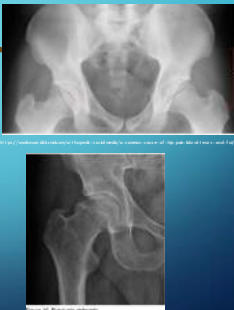
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## FAI SYNDROME

**Diagnostic Imaging**

1<sup>st</sup>, X-ray AP pelvis and lateral (cross-table lateral, frog-leg lateral, or Dunn view)  
 CAM, Pincer, or other cause of hip pain


2<sup>nd</sup>, (if necessary) cross-sectional imaging  
 Further assess hip morphology  
 Associated cartilage and labral lesions



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## WHY THE DELAY?

- FAI often delayed diagnosis (Zhang et al, 2015)
- Why?
  - 7+ months before joint recognized as source of symptoms (Byrd & Jones, 2001)
  - Compensatory/secondary disorders
  - Heterogeneous terminology
    - In 72 studies, 33 different diagnostic terms for hip pain (Semer et al., 2015)
  - Multiple concurrent diagnoses
- Highlights need for consistency of terminology



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Consensus document

Doha agreement meeting on terminology and definitions in groin pain in athletes

OPEN ACCESS  
 Adnan Vaini,<sup>1</sup> Peter Bruckner,<sup>2</sup> Emmanouil Delidakis,<sup>3,4</sup> Jan In't Houtendijk,<sup>5</sup> Gernot Griffin,<sup>6</sup> Karen M. Khan,<sup>7</sup> Greg Lovell,<sup>8</sup> William C. Meyers,<sup>9</sup> Ulrike Mueckewitz,<sup>10</sup> John Oudart,<sup>11</sup> Naoufel Paskov,<sup>12</sup> Max Pithonak,<sup>13,14,15</sup> Gilles Rabreau,<sup>1,16</sup> Philip Robinson,<sup>17</sup> Anthony S. Sabach,<sup>18</sup> Ernest Schilke,<sup>19</sup> Andrew Senior,<sup>20</sup> Holly Sherr,<sup>21</sup> Kostas Theologis,<sup>22</sup> Timothy Tye,<sup>23</sup> Geoffrey Unwin,<sup>24</sup> Robert Van de Vliet,<sup>25</sup> Zdenko Vukobratovic,<sup>26</sup> Ben Wiskul.<sup>27</sup>


- I. Defined clinical entities
  - 1) Adductor-related groin pain
  - 2) Iliopsoas-related groin pain
  - 3) Inguinal-related groin pain
  - 4) Pubic-related groin pain
- II. Hip-related groin pain
- III. Other causes of groin pain

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## DEFINED CLINICAL ENTITIES

**Iliopsoas-related groin pain**

- Iliopsoas tenderness
- Pain on resisted hip flexion\*
- Pain on stretching of the hip flexors\*



**Inguinal-related groin pain**

- Inguinal canal tenderness
- Pain in the inguinal canal
- No palpable inguinal hernia
- Pain with resistance testing of the adductor muscles OR Valsalva/Cough/Valsalva\*

**Adductor-related groin pain**

- Adductor tenderness
- Pain on resisted adduction testing

**Pubic-related groin pain**

- Local tenderness of the pubic symphysis and immediately adjacent bone
- No particular resistance test to provoke pain

Fig. 1. Clinical entities of groin pain as presented by Weir et al. (2015).  
 \* Denotes that the Doha group felt these tests were more likely to rule in the pathology.

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## ADDUCTOR-RELATED GROIN PAIN

Adductor tenderness AND pain on resisted adduction testing.



Resisted adduction




Palpation tenderness

Images from mtdmh.vict, 2014

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### ILIOPSOAS-RELATED GROIN PAIN

Iliopsoas tenderness + more likely if pain on resisted hip flexion AND/OR pain on hip flexor stretching.



Psoas palpation  
- level of ASIS (above)  
- Level of inguinal line

Images from mofradsh et al, 2014



Psoas strength test

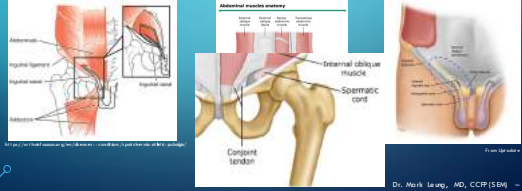


Thomas test - Psoas stretch

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### INGUINAL-RELATED GROIN PAIN

Pain in inguinal canal region AND tenderness of the inguinal canal. No palpable inguinal hernia is present. More likely if aggravated with abdominal resistance OR Valsalva/cough/sneeze.



Abdominal muscle anatomy

Inguinal ligament  
Inguinal canal  
Inguinal ring

Internal oblique muscle  
Spermatic cord

Coarcted tendon

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### PUBIC-RELATED GROIN PAIN

Local tenderness to palpation of pubic symphysis and immediately adjacent bone.  
No resistance test.



Images from mofradsh et al, 2014

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### HIP (JOINT)-RELATED GROIN PAIN

- Hip joint always possible cause of groin pain
- Typical history – “C-sign”
- Hard to distinguish other causes
- May coexist other types of groin pain
- Exam: ROM, FABER, FADIR
- No single discriminatory test
- Most hip clinical tests have good sensitivity, poor specificity





Image from Stone and Stone, 2011

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### OTHER CONDITIONS

An overview of some of the possible causes of groin pain in athletes

Distal femoral clunking (creaking)	Other musculoskeletal causes	Must be excluded
	<p>Inguinal or femoral hernia</p> <p>Proximal femoral pain</p> <p>Hip overuse/pain</p> <ul style="list-style-type: none"> <li>• Iliotibial band</li> <li>• Iliopsoas</li> <li>• Iliotibial band syndrome</li> <li>• Iliotibial band tear</li> <li>• Iliotibial band cyst</li> <li>• Iliotibial band thickening</li> <li>• Iliotibial band calcification</li> <li>• Iliotibial band ossification</li> <li>• Iliotibial band tumor</li> <li>• Iliotibial band infection</li> <li>• Iliotibial band neoplasm</li> <li>• Iliotibial band metastasis</li> </ul>	<p>Proximal femoral pain</p> <ul style="list-style-type: none"> <li>• Hip fracture</li> <li>• Hip dislocation</li> <li>• Hip dysplasia</li> <li>• Hip osteoarthritis</li> <li>• Hip osteonecrosis</li> <li>• Hip infection</li> <li>• Hip tumor</li> <li>• Hip metastasis</li> <li>• Hip synovitis</li> <li>• Hip labrum tear</li> <li>• Hip labrum cyst</li> <li>• Hip labrum ossification</li> <li>• Hip labrum neoplasm</li> <li>• Hip labrum infection</li> <li>• Hip labrum metastasis</li> </ul>



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### LOW BACK PAIN

LOW BACK PAIN STATISTICS  
Clinically Degraded Relevant  
From NIOSH Back Tool

Prevalence: 20-30% (United States)

Incidence: 10-15% (United States)

Age: 40-50

Gender: Male (60%), Female (40%)

Occupation: Manual (60%), Non-manual (40%)

Duration: Acute (60%), Chronic (40%)

Severity: Mild (40%), Moderate (30%), Severe (30%)

Disability: Mild (40%), Moderate (30%), Severe (30%)

Cost: \$100 billion (United States)

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## GROIN PAIN APPROACH

Defined clinical entities

Hip joint related

Other conditions

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## APPROACH TO TREATMENT OF FAI

Options to confirm hip as source of pain

**DIAGNOSIS**  
Femoroacetabular Impingement Syndrome

Additional imaging if indicated (e.g. CT or MRI)

Treatment options

- Conservative care
- Physiotherapy-led rehabilitation
- Arthroscopic surgery
- Open surgery

Adapted from Griffin, 2018 BJSM, Leung, MD, CCIF (SBM) - FAI Simplified

## TREATMENT: CONSERVATIVE CARE

- Education
- Lifestyle modification
- Oral analgesia
- Intra-articular steroid injection
- Similar to hip OA strategy

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## TREATMENT: PHYSIOTHERAPY-LED REHABILITATION

- Improve hip ROM frontal and sagittal plane
- Hip muscle activation and strengthening
- Stabilization of lumbo-pelvic muscle groups
- Changing the soft tissues → Reduce motion-related rubbing of FAI

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## TREATMENT: SURGERY

**OPEN HIP DISLOCATION**

**HIP ARTHROSCOPY**

**RISKS** Complications 2% including prolonged traction and post-induce dnerve injury (e.g., pudendal nerve injury) Most mild and short-lived

RECOVERY	Debridement	Labral repair	Bony re-shaping femoral neck	Microfracture / labral reconstruction
	Immediate WBAT	Crutches 1 month	Crutches 1-2 months	Crutches 2 months
	Full recovery 4-6 months			

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## BEST TREATMENT?

- Results of UK Fashion Trial - Griffin et al, 2018 BJSM
- First RCT comparing physiotherapy-led rehabilitation to hip arthroscopy for FAI syndrome without OA
- 1-year post-treatment symptoms improved better in hip arthroscopic surgery compared to physiotherapy-led rehabilitation
- Recovery up to 6 months, potential risks of surgery, and possibility of improvement with non-surgical treatment

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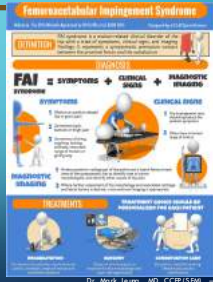
## CONCLUSION

- What is FAI? 2016 Warwick Consensus agreement
- How should FAI syndrome be diagnosed? Triad of features
- 2015 Doha agreement – guide hip exam
  - Defined clinical entities
  - Hip-related groin pain
  - Other condition
- Appropriate treatment of FAI syndrome
  - Conservative care
  - Physiotherapy-led rehabilitation
  - Surgery

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## HANDOUT FOR PATIENTS

<https://bjsm.bmj.com/content/50/19/1179>



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