Athletic Pubalgia/
Femoroacetabular Impingement:
Diagnosis, Management and Outcomes

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Disclosures:
• I have no disclosures to report

Groin Pain??
• Athletic related groin pain: Many sources
  Genitourinary
  Intra-abdominal process
  Muscle strain
  Lumbar spine
  Hip joint pathology

• Other causes of groin pain: Chronic
  - Pubic bone stress injury
  - Nerve entrapment
  - Inguinal hernia
What should we call it?

• Other Terms:
  - Sports Hernia/Sportsman’s Hernia
  - Gilmore Groin
  - Athletic Pubalgia
  - Inguinal disruption

• Common Definition:
  - Activity-related groin pain which improves with rest

• Athletic Pubalgia Definition:
  - Chronic, activity-related groin pain unresponsive to conservative therapy, caused by variety of intrinsic injuries to posterior inguinal wall, complex tension abdominal musculature and adductor muscle origin complex that responds to a complicated rehabilitation program or surgery.

Manchester Consensus Conference

• Manchester, UK
• October 11-12, 2012

• Attendees included surgeons, radiologists, physical therapists with expertise in the field of Sportsman’s groin

• Created position statement 12/10/2013

British Hernia Society’s 2014 Position Statement

• Universal agreement term “Hernia” should **not** be used

• Preferred terminology: **Inguinal Disruption (ID)**
  - ID = tension in the groin due to the high level of twisting, turning, sprinting, and kicking the athletes perform in their sports.
The Stats...

• Occur more often in men, but increasing in women
• Onset can be acute, but often thought as a gradual
• Athletic activities that involve cutting, pivoting, kicking, and sharp turns
• More common in soccer, ice hockey, football
• Incidence estimated at 5%-18% in athletes

Kachingwe J of Orth & Sp Phy Ther 2008

Anatomy

Intra-Abdominal Perspective
**Mechanism**

- Shearing forces from the strong pull of the adductors, against the underconditioned abdominal muscles
- Can lead to attenuation or tearing of the transversalis fascia
- Similar mechanisms may lead to osteitis pubis

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**BHS Statement: ID Pathology?**

- Weak pelvic floor (85% of athletes)
- External ring dilation
- Damage to conjoint tendon
- Inguinal ligament tears
Clinical Presentation

• Exercise-related pain in lower abdomen and groin
• Typically relieved with rest, but returns with resumption of activity
• Usually present for a few days after strenuous activity
• Pain with getting out of bed the following AM

Kachingwe’s Cluster of 5

1. Subjective complaint of deep groin/lower abdominal wall pain
2. Pain that is exacerbated by sport specific activities
3. Palpable tenderness over the pubic ramus at the rectus insertion
4. Pain with resisted adduction at 0°, 45°, and/or 90° hip flexion
5. Pain with resisted abdominal curl up

Physical Exam

• Tenderness or looseness of the external inguinal ring
• Pain with resisted adductor testing or tenderness over the adductor origin
• Pain with resisted testing of the rectus abdominus
• Pubic symphysis tenderness
Inguinal Disruption

At least 3 of the following 5 signs present:
- Pinpoint tenderness over the pubic tubercle at insertion of conjoint tendon
- Palpable tenderness over the deep inguinal ring
- Pain and/or dilation of the external ring without obvious hernia
- Pain at the origin of the adductor longus
- Dull diffuse pain in the groin, often radiating to the perineum and inner thigh across the midline

Imaging

• Plain radiographs:
  – Well-aligned AP pelvis
  – Lateral view of proximal femur
  – Possible Dunn view to evaluate for impingement
  – May demonstrate: osteitis pubis, degenerative hip disease, dysplasia, stress fractures and FAI

• MRI Findings:
  – Attenuation of the rectus abdominus
  – Preperitoneal fat bulging
  – Tears in the insertion of the rectus
  – Adductor pathology

• Dynamic Ultrasound:
  – Operator dependent
  – Not available at all centers
**BHS Statement: Imaging**

- MRI preferred as US often not sensitive or specific.
- Typical findings: edema of pubis symphysis
  - < 18 y.o.: bilateral diffuse bone marrow edema
  - > 18 y.o.: focal subcortical anteromedial pubis edema plus edema of anterior capsule, capsular ligament and enthesis of common adductor longus and rectus abdominus

**BHS Statement: Imaging**

- MRI can help exclude other etiologies of groin pain
- Imaging is recommended for ALL ID patients

**MRI**

T1 T2 Fat Suppressed

RED ARROWS = Rectus Abdominis
BLUE ARROWS = Adductor Longus
* = Common aponeurosis
MRI Abnormalities

Treatment

- Non-surgical:
  - Rest, physical therapy/ATR rehab, NSAIDS, Corticosteroids, PRP
- Surgical:
  - Primary pelvic floor repair without mesh
    - Modified Bassini with/without adductor longus release
  - "Minimal repair" with decompression of the genital branch of the genitofemoral nerve
  - Open anterior repair with mesh
  - Laparoscopic repair with mesh (Transabdominal Preperitoneal (TAP), Total Extraperitoneal (TEP))

BHS Statement: PT

- Individual postural assessment
- Strengthen:
  - gluteus medius/maximus
  - transversus abdominis
  - erector spinae/lateral abdominals
  - hip flexors/hamstrings
- Start isometrics → functional rehabilitation → concentric/eccentrics → sport specific
Surgical Literature
(through January 2014)

• 19 Open repair articles
• 12 Laparoscopic repair articles

• Success criteria = Return to sports activity
• Comparable results open vs. laparoscopic (92.8% vs. 96.0%)

Seattle Perspective 2007-2012

• 75 underwent laparoscopic Total Extraperitoneal (TEP) for Sports Hernia

• 69 male (92%)
• 6 female (8%)

• Unilateral groin pain 42 (56%)
• Bilateral groin pain 33 (44%)

Distribution of Sport

<table>
<thead>
<tr>
<th>Sport Type</th>
<th>Number of Athletes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soccer</td>
<td>19</td>
<td>25.3%</td>
</tr>
<tr>
<td>Football</td>
<td>11</td>
<td>14.7%</td>
</tr>
<tr>
<td>Track and Field</td>
<td>11</td>
<td>14.7%</td>
</tr>
<tr>
<td>Baseball</td>
<td>7</td>
<td>9.3%</td>
</tr>
<tr>
<td>Basketball</td>
<td>4</td>
<td>5.3%</td>
</tr>
<tr>
<td>Ultimate Frisbee</td>
<td>3</td>
<td>4.0%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>20</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

Miscellaneous = hockey, softball, tennis, martial arts, rugby, mountain climbing, equestrian, gymnastics, lacrosse, pickleball, waterskiing
### Level of Athletic Competition

<table>
<thead>
<tr>
<th>Level of Competition</th>
<th>Number of Athletes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collegiate</td>
<td>33</td>
<td>44.0%</td>
</tr>
<tr>
<td>Recreation</td>
<td>31</td>
<td>41.3%</td>
</tr>
<tr>
<td>High School</td>
<td>7</td>
<td>9.3%</td>
</tr>
<tr>
<td>Athletic Instructor</td>
<td>3</td>
<td>4.0%</td>
</tr>
<tr>
<td>Professional</td>
<td>1</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

### Findings

- 100% attenuation or weakness of posterior floor
- 74 (98.7%) had bilateral floor attenuation
- 1 (1.3%) had unilateral findings
- 11 (14.7%) had occult inguinal hernia
- 2 (2.7%) had lipoma of the cord
- 100% return to sport

### Seattle Pacific University

- 2008-Current
  - 7 cases total 6 male, 1 female
  - 4 cases presented as chronic
  - 3 cases presented as acute
  - 6 soccer, 1 basketball
SPU Management

- 2 athletes were managed non-surgically
- 5 athletes were managed surgically
- Of the non-surgical patients one was managed in season and one non-competitive season
- All 7 outcomes returned the athletes from essentially unable to participate to full return without restriction.

Rat City Roller Girls (WFTDA)

- 2011-2014
- 8 skaters with missed time due to groin injuries:
  - 3 AP, 2 of which had concomitant FAI (both treated surgically)
  - 1 pubic ramus stress fracture
  - 4 with recurrent adductor injuries without abdominal pain

Does AP have a partner?

- Femoroacetabular Impingment (FAI):
  - Motion limiting FAI may contribute to development of AP/ID
  - Cadaveric study demonstrates increase pubic symphysis motion with a simulated CAM deformity vs native non-CAM (Birmingham 2012)
  - High incidence of AP in professional athletes with symptomatic FAI (Hammoud 2012)
Femoroacetabular Impingement

- Descriptive term for 2 main variations of hip abnormalities, resulting in observed patterns in chondral and labral injury

- Cam impingement results in loss of offset of the femoral head-neck junction

- Pincer impingement due to focal rim lesions or cephalad retroversion

Femoroacetabular Impingement

FAI: Imaging Findings

- Crossover sign: Pincer

- Osseous Bump (CAM)
**High Incidence of AP and FAI**

- 38 consecutive professional athletes underwent arthroscopic FAI surgery (Hammoud 2012)
- 32% had previously undergone AP surgery and failed to return to previous level of competition
- 39% have AP symptoms resolve with FAI surgery alone
- 36/38 FAI surgery patients returned to previous level of play
- ALL 12 with combined FAI and AP surgery returned to professional competition

**Success of FAI vs AP Surgery**

- 37 hips diagnosed with both AP and intraarticular hip pathology (Larson 2011)
- 25% who had primary AP surgery returned to sports w/o limitations; 69% subsequently had hip arthroscopy to correct FAI
- 50% of hips with primary hip arthroscopy returned to sports w/o limitations; 43% subsequently had AP surgery
- 89% of hips with combination AP/Hip arthroscopy surgery returned to sports w/o limitations
Diagnostic Injections

- Low volume intra-articular hip injection can help determine if the pain is hip-joint related
- Guided injections into the pubis symphyisis can help with osteitis pubis and some AP
- Adductor and psoas specific guided injections can help differentiate those disorders from AP and intra-articular hip pathology

Conclusions

- AP is a complicated MSK problem
- A careful history, physical exam and imaging studies are needed for an accurate diagnosis
- Nonsurgical treatment should be attempted first
- Surgical options vary but most return to their prior level of activity
- Some patients have coexisting intraarticular hip disorders that may need to be addressed simultaneously.

Thank You!