Hip Problems: Is There Really a Sex Difference?
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Outline
Discuss sex-based differences in:
- Differential diagnoses
- Anatomy/Pathoanatomy
- Prevalence
- Presentation
- Treatment
- Outcomes

Differential Diagnosis of Groin Pain: The Layered Approach

Layer 1: Osseous
Hip Joint:
Female (77%) > male (45%)²

Static overload:
OA - female > male²
Femoral neck stress fracture - female > male³
Pubic bone stress injury - male > female³

Dynamic impingement (FAI):
Male (45.2%) > Female (30.7%)²

Dynamic instability (FAI, dysplasia, ligamentous laxity):
Dysplasia: female > male²
Ligamentous laxity: female > male²

Layer 2: Capsuloligamentous
Labrum:
Female (47.7%) > male (33.5%)²

Ligamentum teres:
Female (19.3%) > male (7.2%)²

Capsular laxity:
Females: ↑ capsular volume : femoral head volume ratio³

Layer 3: Myotendinous
Muscles of pelvis, lumbosacral, pelvic floor

Layer 4: Neurokinetic
Lumbosacral plexus, lumbopelvic tissues
Ilioinguinal, iliohypogastric, genitofemoral nerves

Disclosures
None
Layer 3: Myotendinous

- Core muscle injury: male > female
- Adductor injury: male > female
- Iliopsoas injury: female > male
- Pelvic floor injury: female >> male

Layer 4: Neurokinetic

- Hernias – Seen in combination with FAI in 41% of cases
  - Inguinal hernia: man > woman
  - Femoral hernia: woman > man
- “Sports Hernia” / Core Muscle Injury / Athletic Pubalgia: man > woman
  - Weakened posterior wall of inguinal ring
    - Transversalis fascia, conjoint tendon, rectus abdominis insertion, internal/external abdominal obliques

FAI Classification: Men vs Women

- CAM: male (64-100%) > female (65-88%) / Isolated cam: female (47-68%) > male (38-44%)
  - Larger CAM in men
  - Mean alpha: males 63.6-70.8, females 47.8-57.6
  - Alpha >70: 50% males, 16% females
- Pincer: male (56%) = female (47%) (p=0.464)
- Mixed: Male > Female

Cam: Abnormal contact between the femoral head and acetabulum damages labrum between the two

Pincer: extra bone on the acetabulum

Mixed: cam + pincer

Femoroacetabular Impingement

('Hip Impingement' / FAI)

FAI: Abnormal contact between the femoral head and acetabulum damages labrum between the two

- Pincer: extra bone on the acetabulum
- Cam: extra bone on the femoral head/neck
- Mixed: cam + pincer
Acetabular / Proximal Femur Anatomy in FAI

**Acetabular Version**
- **Females:**
  - ↑ Anteversion (17.3º-22.2º vs 13.9º-19.1º) [13,15,17]
- **Males:**
  - ↑ Retroversion (62.7% M vs 55.4% F) [14]

**Femoral Version, etc**
- **Females:**
  - ↑ Anteversion (14.4º-15.5º vs 11.3º-12.1º) [15,16]
  - ↑ Femoral neck-shaft angle [13] 134.1º vs 131.2º (p=0.012)

**Combined Version**
- **Females:**
  - ↑ McKibbin Index (4-6º > than men) [15]

**Acetabular Dysplasia: Men vs Women**
- Infantile DDH: 98% Female [18]
- Adolescent/Adult-Diagnosed Dysplasia: 88% Female

**Sport-Specific Risk of FAI** [19]
- **Contact**
  - Football, rugby, wrestling
- **Impingement**
  - Ice hockey, overhand, baseball catcher, water polo, basketball, tennis, golf, field events
- **Cutting**
  - Soccer, basketball, lacrosse, field hockey
- **Asymmetric/Overhead**
  - Baseball, tennis, golf, rainball, field events
- **Endurance**
  - Track, triathlony, cycling, swimming
- **Flexibility**
  - Dance, gymnastics, yoga, cheer, figure skating, martial arts

**Demands of Sport on the Female Hip**
- **Jump landing mechanics** [20]
  - Females:
    - Flex at initial contact
    - ROM after contact (force dissipation)
    - Hip ROM: 57.9º (50.4º in males)
    - Peak hip angular velocity: -579.4 º/sec (-443.6 º/sec in males)

- **Supraphysiologic ROM**
  - MRI of dancers in split [21]
    - ~2mm femoral head subluxation↑ in dynamic activities
    - Labral tears, cartilage thinning, herniation pits (superior and posterosuperior)
  - Controls: anterosuperior labral tears, ↓ cartilage lesions/pits

**Presentation Differences: ROM**

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<th>FAI Hip ROM</th>
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**Clinical Presentation** [13]
- **Pain Severity**
  - Females:
- **Pain Location**
- **Pre-Op PROS**
  - Females:
  - mHHS and WOMAC gender differences > MCID
Intraoperative Findings

Significantly more in men:
1. Labral deinsertion length: 26.4 mm vs 22.0 mm
2. Posterior tear extension
3. Advanced cartilage changes (Beck 4-5)
4. Microfracture (73.8% male vs 68.4% female)
5. Cartilage defect size
6. Posterior extension of cartilage injury
7. 14% vs 5.5%

No gender difference:
- Labral pathomorphology
- Labral repair (76% vs 74%)

Significantly more in women:
- Early cartilage changes (Beck 1-2)
- 23% vs 44%

Technique Differences

Stronger caution against iatrogenic destabilization
- Labral preservation
- Capsular plication
- Respect secondary stabilizers

Revise:
- LT
- Minimal necessary acetabuloplasty (<3 mm)

Outcomes: PROS Improvements

Poorly studied
Some show equal PROS, others show ↓ scores in females

Older women (≥45) = worst PROS

Outcomes: Revision Rates

- Females:
  - 64% revisions are female compared to 52% primaries

Reasons for revision:
- Residual intra-articular FAI (74.8%)
- Extra-articular impingement (23.5%)
- Residual acetabular dysplasia (8.2%)
- Other (posterior osteoarthritis, capsular adhesions, microinstability, osteochondral lesion) (7.5%)

Why Females??
- Inadequate functional decompression
- Know that these patients do worse pre-op with lesser pathology
- Hormones & adhesion formation?
- Microinstability

Summary

Differential Diagnoses: more common in women -
- Femoral neck stress injury
- Ligamentum teres injury
- Dysplasia
- Labral tear
- Femoral impingement

XR:
- Isolated: CAM more common in women
- Smaller CAMs
- Antversion (femoral, acetabular, combined)

Presentation:
- ↑ pain, ↓ PROS, ↓ ROM

Intraoperative: Smaller labral tears, less severe cartilage defects

Outcomes: ↓ Revision

Be aware of iatrogenic instability!