Imaging of the Athletes’ Hip

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Hip Imaging

- Fractures
- Soft tissues
- Labrum and FAI
Hip Imaging

- Fractures
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Stress fractures

- Femoral neck - compressive, tensile
- Sacrum
College freshman w/ groin pain
Recreational runner (20 miles/wk)
Axial T 1 and T 2 w/FS
42 y.o.
ultra marathoner
22 y.o. collegiate tennis player
20 y.o with left SI joint pain
Anything else??
Hip Imaging

- Fractures
- Soft tissues
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Hamstring

Hamstring injuries
Greater trochanteric bursitis

- Pain lateral aspect of hip
- Usually due to repetitive hip flexion
- Mimics gluteus medius tendon tears
- Rx NSAIDs/steroid injection
- ↑ SI T2WI
Indirect rectus femoris tear

28 y.o. kick boxer with hip pain

Aka “Reflected head”
“Sports Hernia”

Aka- athletic pubalgia, osteitis pubis

• Imbalance btw rectus abdominus and adductor muscles

• Symphyseal instability

• Pain can be in symphysis, hip or back
28 y.o. Professional hockey player
Hip Imaging

- Fractures
- Soft tissues
- Labrum and FAI
Labrum

- Rim of fibrocartilaginous tissue around acetabulum
- Low signal, triangular structures
- Thicker posterosuperior, thinner anteroinferior
Labrum

- Blends with transverse ligament at notch
- Anterior and posterior joint capsule attaches directly at base of labrum
- Superior capsule inserts several mm from labrum creating a paralabral recess
Labral tears

- Persistent pain, clicking ± ↓ ROM
- Single traumatic event, chronic stress, DDH
Labral Tear

Spectrum of Dysplasia to Impingement

• Dysplasia
  • Acetabulum too small, deficient or deformed

• Impingement
  • Acetabulum too big or retroverted or femoral head malformed
DDH - Labral Hypertrophy
Hip Dysplasia with Labral Hypertrophy and Tear
Labral tears

Appearance

• Linear, diffuse high signal
• Deformity of contour
• Detachment from acetabulum
• Paraarticular cyst
Labral tears

• Most tears anterior-superior labrum

• Posterior and posterosuperior tears more common in younger individuals and Asian countries

• Chondral defects associated 30% of labral tears and detachments
Labral tears

Mimickers

- Iliopsoas tendon crosses over labrum
- Acetabular cartilage extends medially
- Sublabral recess
27 y.o tennis player with right hip pain
32 y.o. pain and clicking during yoga
Oblique Axial Images

Useful for labral tear detection
34 y.o. male with left hip pain
Impingement
Femoroacetabular impingement

• Abnormal configuration of acetabulum

• Bony protuberance of femoral neck
  (abnormal femoral head/neck junction)

• ? Synovial herniation pit

Kassarjian et al, Rad.236(2)p.588-592
Pincer Effect

Acetabulum too big, deep or with overhanging edges
-Impinges on femoral head/neck junction with ROM
Pincer Impingement

Femoral head can ‘lever’ back, impinging on posterior acetabulum causing a “contra-coup” lesion.
Cam Impingement

As the hip is flexed, the non-spherical portion of the femoral head impinges on the acetabulum.

Anterior labrum / cartilage impinged
Cam Impingement
...is femoral-acetabular impingement REAL??
Summary of Findings FIA

- Retroversion (figure of 8 sign)
- Deep acetabular socket
- Spur at anterolateral femoral head-neck junction
- Lack of lateral femoral neck concavity
- Synovial herniation pit
- Os acetabulare
- Anterior labral tear / cartilage loss
Conclusions

• MR imaging is the modality of choice for evaluating pathology in and around the hip

• Hip pain and negative x-rays = MRI