Snapping Hip and Impingement

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Outline
- Femoroacetabular impingement
- Ischiofemoral impingement
- Snapping hip syndrome

Hip Labrum
- Normal: hyperechoic, triangular
- Degeneration: hypoechoic
- Tear: anterior
  - Anechoic cleft
  - Sensitivity 82%, specificity 60%, accuracy 80%*

Chondrocalcinosis
- Detachment
  - Full-thickness or detachment
  - Anechoic to hypoechoic
  - Multilocular

Labral Tear and Paralabral Cyst
- Associated with labral tear
  - Full-thickness or detachment
  - Anechoic to hypoechoic
  - Multilocular

Femoroacetabular Impingement
- Pincer-type: deep acetabulum
- Cam-type
  - Broad irregular femoral neck
  - Possible cortical irregularity at US
- Associated with anterior labrum tear
- Consider dynamic evaluation


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**CAM Impingement**

Note: labral tear (yellow arrow) and osseous bump (white arrow)

Courtesy of M. van Holsbeeck, Detroit, MI

**FAI: Ultrasound**

- Ultrasound can demonstrate a bony protuberance and non-spherical head associated with CAM FAI
- Alpha angle measurements
  - Buck et al.: unreliable
  - Lerch et al.: strong correlation with MRI


**Femoroacetabular Impingement**

Sagittal-oblique

**Total Hip Arthroplasty:**

- Metal components demonstrate posterior reverberation
- Artifact occurs deep to prosthesis away from fluid collection (unlike MRI, CT)

**Hip Arthroplasty:**

- Ultrasound cannot differentiate small effusion from post-op change
- Suspect infection:
  - Pseudocapsule > 3.2 mm: suspect infection
  - Extra-articular fluid collection
  - Not visualized with arthrography if non-communication

Weybright PN et al. AJR 2003; 181:215
AJR 1994; 163:381

**Arthroplasty Impingement**

- Anterior cup rim impingement
- Deep to iliopsoas tendon
- Ultrasound-guided steroid injection can be considered

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Sonographic Technique: Hip

• Posterior
  – Piriformis
  – Superior gemellus
  – Obturator internus
  – Inferior gemellus
  – Obturator externus
  – Quadratus femoris
  – Sciatic nerve

Hip: external rotators

Ischiofemoral Impingement

• External impingement
• Narrowed space between ischial tuberosity and femur
• Associations:
  – Coxa valga
  – Variations in bone anatomy
  – Hip and pelvis instability
  – Abductor / adductor muscle imbalance

Normal Ischiofemoral Impingement: MRI criteria

• Narrowed ischiofemoral space:
  – 15 mm or less
  – 77% sens, 81% spec, 78% accurate
• Narrowed quadriceps femoris muscle space
  – 10 mm or less
  – 79% sens, 74% spec, 77% accurate
• Abnormal signal of quadriceps femoris muscle
• Seen in 9% of asymptomatic individuals

Ischiofemoral Impingement

• Variations exist in ischiofemoral distance:1
  – Narrowed with external rotation and adduction
  – Decreased in prone position
  – Increased with hip flexion
• Ultrasound of ischiofemoral space measurement equal to MRI2
• Ultrasound guided injection of quadriceps femoris:
  – Corticosteroids3
  – Botulinum toxin4

From: 1Finnoff JT et al. PMR 2017; 9:392
2Johnson AC et al. Skeletal Radiology 2017; 46:59
4Chen Y-T et al. PMR 2018; 10:665
Outline

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Snapping Hip Syndrome

• Painful snap with hip motion
• Intraarticular
• Extraarticular:
  – Anterior: iliopsoas tendon
  – Lateral: iliotibial tract or gluteus maximus

Snapping Hip Syndrome: iliopsoas

• Image long axis to inguinal ligament superior to femoral head
• Extension of flexed abducted and externally rotated hip
• Abrupt movement of iliopsoas as iliacus muscle interposed between tendon and bone moves

From: Deslandes et al. AJR 2008; 190:576
Snapping Hip: lateral

- Transverse over greater trochanter
- Hip external rotation / flexion
- Abrupt motion of iliotibial tract or gluteus maximus over greater trochanter

Snapping Gluteus Maximus / Iliotibial Band

- Gluteus Medius
- Gluteus Maximus
- Iliotibial Band
- TFL

Proximal hamstring: at ischial tuberosity

- Conjoined ST-BF: tendinosis

Conjoined Biceps Femoris-Semitendinosus: tendinosis

- Short Axis
- Semimembranosus
Conjoined BF-ST Tendon: partial tear

Long Axis

From: Bierry et al. Radiology 2014; 271:162

Snapping Conjoined Long Head Biceps Femoris, Semitendinosus + Sacrotuberous Ligament

From: Bierry G et al. Radiology 2014;271:162
Spencer-Gardner LS et al. PMR 2015; 7:1102

Take-home points

- Femoroacetabular impingement:
  - Indirect ultrasound findings
- Ischiofemoral impingement:
  - US-guided injection
- Snapping hip:
  - Iliopsoas anatomy review
  - Dynamic evaluation

Syllabus on line and other educational material:
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