MSK Radiology
Interesting Case Presentation

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Patient 1: YPY F/27

- Professional badminton player
- C/o sudden onset of right shoulder pain after a “very vigorous match” in an international tournament
- Cannot move the right shoulder
Private MRI Report

- Right shoulder joint effusion
- Moderate synovial hypertrophy lining the right shoulder joint capsule
- Non-specific features: suspicious of right shoulder arthritis (inflammatory or infectious)
- Other ddx: crystal deposition eg calcific capsulitis
- Suggest aspiration of joint fluid
Progress

• Attempted joint aspiration: ? Turbid fluid
  – Large no of WBC
  – Negative for crystals
  – C/ST –ve (including N. gonorrhoea); fungal and AFB stain and culture were all negative

• Referred for ultrasound scan
US of right shoulder
Progress

- Diagnosis: Collapse pre-existing subcortical cyst
- Joint fluid has resolved
- No evidence of crystal arthropathy or septic arthritis
- On conservative management; probably need to withhold from the coming tournament
Patient 2: ZSF 44/F

- Works in a supermarket
- Had “hip sprain” while working
- Then noted pain on both groins, L>>R
- No pain on external or internal rotation of the joints
- Pain on straight leg raising
- Symptoms out of proportion to severity of trauma
Initial MRI
Initial MRI
Follow-up MRI 6 months later
Follow-up MRI
Diagnosis

- Muscle sprain of left obturator externus
- Bilateral ischiofemoral impingement (L>R)
Ischiofemoral impingement

• An unusual cause of hip pain in women

• The hip has 3 main bony sources for impingement:
  – Acetabulum vs femur
  – Ischium vs femur
Quadratus femoris muscle (QFM) is a flat muscle (Q) which has an origin on the Lateral margin of the obturator ring above ischial tuberosity and insertion on the Quadrate tubercle and adjacent bone of intertrochanteric crest of proximal posterior femur.

IG: Inferior gemellus; OI: Obturator internius; SG: Superior gemellus
P: Piriformis; SN: Sciatic nerve.
Ischiofemoral impingement

- Non-focal groin or buttock pain
- Pain of ischium with radiation to medial thigh
- Painful popping; difficult to localise
- Often diagnosed as “snapping iliopsoas”
Ischiofemoral impingement in literature

The ischiofemoral space (line A) = the narrowest distance between the lateral cortex of the ischial tuberosity (sphere) and the medial cortex of the lesser trochanter (star). [Normal < 17mm]

The quadratus femoris space (line B) is delineated by the superolateral surface of the hamstring tendons (thin arrow) and the posteromedial surface of the distal iliopsoas tendon (curved arrow) [Normal < 8mm]

(Definition by Torriani et al. AJR 2009: A cohort of 12 hips in 9 patients; 11 hips in 10 normal controls)
Ischiofemoral impingement in literature

- A cohort of 1598 hips at 805 patients (by Tosun et al. in 2012)
  - 50 patients with a total of 70 hips with hip pain and quadratus femoris oedema +/- fatty replacement
  - Prevalence 4.4%
  - Bilateral involvement 40%
  - Female 84%

- Most frequent associations
  - History of surgery, fracture or arthrosis
  - Gender (female)
  - Congenital
  - Hamstring tendinopathy
  - Positional (eg ballet dancers)
  - Coxa valga
• Not all patients with ischiofemoral impingement have narrowing of the ischiofemoral space!

• Not all ischiofemoral space narrowing or quadratus femoris oedema are symptomatic!

• When in doubt, the diagnosis can be confirmed by local anaesthetic infiltration
Ischiofemoral impingement: Treatment

- Optimal strategy is unclear
- Conservative
  - Modify activity (active rest + avoid provoking activities)
  - NSAID
- Steroid Injections
  - Lidocaine (1%) admixed with methylprednisolone 40mg
  - Injected into ischiofemoral space under CT guidance with 18G spinal needle
  - Hip in external rotation, anterior approach: below inguinal ligament and lateral to neurovascular bundle
  - Instant relief of symptoms – diagnostic +/- therapeutic
- Surgery
  - To widen ischiofemoral space and resect lesser trochanter
Patient 3: MCK 11/M

- Sudden onset of left hip pain when sprinting
- No actual fall or contusion
- Unable to bear weight afterwards
- Limited internal rotation and pain on axial loading
X Ray Pelvis
Initial MRI Left Hip and Pelvis
Initial MRI

Report: No hip fracture; oedema of left iliopsoas and gluteal minimis muscles, ?contusion

Managed conservatively as muscle contusion

Walking and running as tolerated on follow-up
Follow-up MRI 2 months later
Diagnosis

- Healing fracture anterior inferior iliac spine
- No labral tear
Patient 4: CYT 14/M

- U16 Soccer player
- C/o Right groin pain during fast running in a fitness test
- ? Click sound noted
- Pain and weakness of the right leg afterwards
MRI Pelvis and Right Hip
Progress

• Diagnosis: Avulsion fracture of anterior superior iliac spine
  – fragment displaced anteriorly and inferiorly
  – Sartorius, tensor fasciae lata and inguinal ligaments still attached to avulsed fragment

Treated conservatively with brace
Avulsion injuries

- Common among participants in organised sports, especially among adolescent participants.
- Secondary ossification centers located on the ends of the long bones are named epiphyses and those at the insertion site of a muscle are named apophyses.
- Ossification of the pelvic bone apophyses occurs during adolescence, which is a time of increased physical activity for most people.
- The ratio of muscular strength to physeal strength is greatest during early puberty when the chondrocalcinosis is not yet complete.

Prevalence among young athletes?
A cohort of 203 cases

Avulsion injuries

- At radiography,
  - acute injuries (ie, those resulting from extreme, unbalanced, often eccentric muscular contractions) → associated with avulsed bone fragments
  - subacute injuries → an aggressive appearance that may include areas of mixed lysis and sclerosis
  - chronic injuries (ie, those resulting from repetitive microtrauma or overuse) or old inactive injuries → associated with a protuberant mass of bone and may bear a striking resemblance to a neoplastic or infectious process.
ASIS Avulsion Fracture

- attachment site for the sartorius muscle and the tensor muscle of the fascia lata
- occurs in sprinters during forceful extension at the hip
- patients present with pain just below the most anterior aspect of the iliac crest
- sometimes the avulsion fragment can be palpated
- usually heal quickly and without sequelae after simple restriction of activity

- As the fusion of the ASIS apophysis occurs later than the fusion of the AIIS, the fractures of the ASIS are more common in older adolescents and young adults.
AIIS Avulsion fracture

- less common than that of the ASIS
- origin of the straight head of the rectus femoris muscle
- also results from forceful extension at the hip
- Avulsion of the ASIS can simulate this injury if the fragment is retracted inferior to the level of the anterior inferior iliac spine
Avulsion of iliac spine (ASIS / AIIS)

- Avulsions of both the anterior superior and anterior inferior iliac spines tend to be less symptomatic and disabling than avulsions of the ischial tuberosity, and recovery time is relatively short.
- Such injuries are first treated with bed rest with the hips and knees flexed, then with progressive ambulation.
- Full athletic potential is regained in about 5–6 weeks.