March 2013 Case Study

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CC: Right leg pain

HPI:
The patient is a 16-year-old girl who presents with new onset right leg pain. The pain started 9 days prior to presentation while she was running sprints with her track team. She felt a pop in the proximal aspect of her right hamstrings. The pain was sharp, and she could not continue running. She was limping that day, but did not notice any swelling or bruising. Her primary care provider advised her to rest, and use ice and anti-inflammatory medication for the pain. Her parents brought her to the sports medicine clinic for evaluation. The pain has improved some, but she still feels that she is unable to run. It is aggravated by activity, and improved with rest. The pain remains isolated to the proximal right hamstrings without radiation. She has no complaint of weakness, numbness, or tingling in any extremity. She has not had previous pain or injury in this location. She does not have any unexplained constitutional symptoms, including fever or weight loss. The remainder of her review of systems is negative. Her past medical history is non-contributory.

Physical Exam:
Temperature 36.8 °C, Ht 1.57 m (5' 1.65"), Wt 50.1 kg (110 lbs), BMI 20.4
General: Well developed, well nourished, no acute distress; alert and oriented

Thigh, Hip and Pelvis:
- Normal muscle mass, no atrophy
- Diffuse tenderness to palpation right proximal hamstring, no point tenderness or defect palpated, no palpable masses.
- Full and symmetric ROM at hips bilaterally, no pain with active or passive internal or external rotation.
- Strength: 5/5 strength of all muscles of the bilateral hips and pelvis except right hamstring where strength is slightly decreased compared to the left
- Pain with resisted knee flexion on the right, otherwise no pain with resisted muscle testing including sartorius, rectus femoris, and iliopsoas
- Straight Leg Raise: Negative bilaterally
- Impingement: Negative bilaterally
- FABER: Negative bilaterally
- Trendelenburg: Negative bilaterally
- Popliteal angles: 35° R/ 15° L

Spine:
- No evidence of scoliosis, no cutaneous findings over spine, no obvious rib hump with forward bending.
- The pelvis is level
- No pain with forward bend or extension
- No pain with side bending to the right or left
- No pain with hyperextension to the right or left

Neurologic:
- Patellar and Achilles deep tendon reflexes are normal
- Light touch sensation over both lower extremities is normal
- Normal gait
Differential Diagnosis
Hamstring strain
Gluteal strain
Ischial avulsion fracture
Trochanteric avulsion fracture
Pelvic/femoral neck stress fracture
Piriformis syndrome
Lumbar disc bulge/herniation

Imaging
AP radiograph of the pelvis was obtained in the office and showed the bones to be intact with no evidence of fracture or dislocation. Ischial tuberosity apophyses are normal with no evidence to suggest avulsion. There is a prominent ischiopubic synchondrosis on the left, which is a normal anatomic variant.

Diagnosis
Right hamstring strain.
Incidentally identified asymmetry of ischiopubic synchondroses.

Treatment/Outcome
The patient was advised to limit activity that caused pain. Physical therapy was prescribed to aid in the recovery of her muscle strain. This included institution of an appropriate stretching and strengthening program, and use of modalities to facilitate proper recovery from this injury. The patient did not return for follow-up and attempts to contact the family were unsuccessful.

Discussion
Hamstring strains are common in athletics, particularly in sports that involve significant running and jumping such as track and field. Our athlete was deemed to have an uncomplicated hamstring strain. However, the imaging obtained in her workup revealed asymmetric enlargement of the ischiopubic synchondrosis (IPS).

A synchondrosis is a cartilaginous union between two bones that is typically found only during the period of skeletal growth. They have been referred to as “temporary joints”, because the cartilage is often replaced by bone prior to adulthood. The IPS is the hyaline cartilage connection between the inferior ischial ramus and the inferior pubic ramus. This synchondrosis typically fuses before skeletal maturity is reached, and generally occurs between ages 4 and 12.
IPS enlargement is said to occur in all growing children, and is considered a normal process during development. Young children more often exhibit bilateral enlargement. However, unilateral enlargement is seen in older children nearing skeletal maturity. In a series of 32 patients with an average age of 7.5 years, Herneth et al. found bilateral enlargement in the majority of subjects (72% vs. 28% unilateral). They determined that unilateral IPS enlargement is typically seen in the non-dominant leg. A possible explanation is that this leg, used as the plant leg for jumping and kicking, receives excess stress leading to different force application across the ipsilateral IPS, leading to enlargement compared to the dominant leg side. This correlates with previous work done by Hubner and colleagues, who described unilateral IPS enlargement opposite of the affected hip in children with diagnoses such as Legg-Perthes disease and unilateral hip dislocation.

The evaluation of pain or other complaints at the hip and pelvis often involves plain radiographs and potentially more sophisticated imaging. A diagnostic dilemma can arise when a provider is faced with enlargement of the IPS, particularly when it is seen unilaterally. The differential diagnosis of enlarged IPS has historically included stress fracture, neoplasm, and osteomyelitis. Careful consideration should be taken to determine the likelihood of such diagnoses prior to further intervention. This is particularly true given that edema can be seen surrounding the IPS when viewed by MRI. Our patient had right proximal hamstring pain, but left sided IPS enlargement, providing more evidence that her x-ray finding was not responsible for her complaint.

It is important to have an understanding of the ischiopubic synchondrosis in the evaluation of the pediatric patient with hip, groin, pelvic, or buttock pain. Enlargement is normal during growth, may be unilateral, and is typically asymptomatic. If the original diagnosis does not resolve as expected, there may be concern for more serious pathology associated with the IPS. This should prompt reassessment and consideration of further work-up.

References