February 2013 Case Study

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CC: Left groin pain

HPI:
JR, an athletic two-sport 15 year-old male, presents to Sports Medicine clinic with a 4 month history or left groin pain. He injured his groin while competing in the annual regional track meet where he was the final leg of his 4x200 relay team. After about 25 meters, JR felt and heard what he described as a sudden pop in his left hip. He immediately fell to the ground and was unable to finish the race. He reported 7/10 non-radiating pain in his left groin and difficulty with flexion of his left hip to the certified athletic trainer on-site, who advised treatment with rest and ice. After a week of rest and NSAID use without improvement, JR’s father, a local obstetrician, prescribed a short course of steroids to try to “get over the hump” and returned JR to practice. When the pain continued, orthopedic evaluation was obtained resulting in prescribed NSAID use and an MRI without contrast of his left hip (completed 2 months following injury) which revealed only “muscle edema around the myotendinous junction of the iliopsoas unit consistent with a muscle strain injury.” At that time physical therapy was prescribed. Initially, these sessions were thought to be helpful but after 2 months, JR still complained of continued pain (3/10 with activity and 1/10 with ADLs, including increased discomfort while rising from bed and walking up steps) and was unable to return to sport. At this point, he was brought in to our office for a second opinion. Upon questioning in our office, JR denied locking, catching, swelling or radicular symptoms.

Physical Exam:
General: Well appearing, no acute distress.

Gait: Obvious short stance phase antalgic gait with loss of hip flexion in the non-weight bearing left leg.

Inspection/Palpation: No swelling or warmth appreciated. Diffuse mild tenderness to palpation medially and inferiorly to ASIS/AIIS bony landmarks.

Range of Motion: Stiffness noted with passive range of motion in hip flexion and abduction. Difficulty, due to pain, noted with external rotation with minimally decreased ROM (5-10 degrees) as compared to opposite side. No snapping or clicking appreciated with passive or active range of motion.

Strength: 4-/5 with resisted hip flexion while supine and sitting with pain. 5/5 in abduction/adduction.

Special tests:
Negative Trendelenberg sign. FABER/Patrick test, Thomas test, log roll and hip scour (axial load placed through femur while performing external and internal rotation in supine position) all negative.

Neurovascular: 2+ pulses, sensation intact throughout lower extremities
Differential Diagnosis:
AIIS avulsion – rectus femoris
ASIS avulsion - sartorius
Ischial tuberosity avulsion – hamstrings
Iliac crest avulsion – obliques and gluteus
Lesser trochanter avulsion - iliopsoas
Iliopsoas tendon rupture
Muscle strain
Snapping hip
Femoral neck stress fracture
Impingement/Labral tear
Hip dislocation
Slipped Capital Femoral Epiphysis (SCFE)
Legg-Calve-Perthes disease
Transient synovitis
Femoral hernia
Testicular torsion

Imaging:
AP and oblique radiographs of pelvis demonstrate prior avulsion fracture of the left lesser trochanter with a non-united dystrophic calcification/avulsion fragment.
**Diagnosis:**
Lesser trochanter avulsion fracture

**Treatment/Outcome:**
It was thought that incomplete rest periods had impaired the healing process which in-turn lead to his continued pain. Recommendations were given for complete rest with re-introduction into physical therapy. After 3 weeks (2 weeks of complete rest with 3rd week introducing gentle strengthening exercises), 50% improvement in strength noted with further improvement to 75% following 4 more weeks of physical therapy. After 12 total weeks from initial appointment date, patient reported 95-100% improved, noting soreness only with intense therapy sessions. He was cleared to return to sport the following month with instructions to follow-up if pain intensified.

**Discussion:**
Apophyseal injuries, including both acute and overuse injuries, make up a substantial portion of clinical visits to pediatric sports medicine providers.\(^1\) Acute injuries to apophyses present as avulsion fractures at the growth plate where the muscle-tendon unit attaches. Six major apophyseal sites exist throughout the hip and pelvis and are capable of sustaining avulsion fractures. These sites include iliac crest, anterior superior and inferior iliac spines, greater trochanter, lesser trochanter, and ischial tuberosity.\(^4\) These injuries occur most frequently during mid to late adolescence (14-18) when the pelvic apophyses are at their weakest. As seen in this case, competitive sprinters/runners seem to be at higher predilection for these types of injuries, with evidence showing the running cohort comprises nearly half of all patients with pelvic avulsion fractures.\(^1\)
Lesser trochanter avulsion fractures, however, are relatively rare injuries; being seen in less than one percent of hip injuries.\textsuperscript{2} One large center further estimated that this type of injury only makes up 0.3\% of fractures of proximal femur.\textsuperscript{3} Although most commonly occurring in adolescence, one author described three cases of lesser trochanter avulsions in patients as young as 1.2 years but with exact details of injury unknown. In these patients, a full recovery was noted with treatment ranging from hip spica casting to bed rest but return to activities of daily living occurred within 3-4 weeks following diagnosis.\textsuperscript{3}

Radiographically, the importance of having films taken with slight external rotation to bring this apophysis into view was stressed throughout the examined literature. Case reports consistently show the lesser trochanter avulsion fragment being pulled proximally by a distance of 1-2cm. Distance of the displaced fragment from femoral shaft, however, does not seem to correlate with symptoms or length of time necessary for recovery.\textsuperscript{2,4}

Symptomatic and conservative care, including rest and crutches as needed, typically lead to a favorable prognosis and full recovery.\textsuperscript{4} One author showed 1-2 weeks assisted walking followed by 2-3 weeks of unassisted ambulation led to activity as tolerated by 6-8 weeks and return to full speed, contact sport by 12 weeks after initial injury.\textsuperscript{2} In one unfortunate case described by Quarrier, a patient did endure 6 years of symptoms until removal of the avulsed ossicle embedded in the psoas tendon was performed.\textsuperscript{7} Avulsion fractures in general, though, rarely require surgical intervention.

More pertinent to the adult population, a second cause of a lesser trochanter fracture is when a pathologic fracture occurs with little or no history of trauma. When an isolated lesser trochanteric fracture occurs in a patient with closed growth plates, it is thought to be pathognomonic for neoplasm. This likely occurs when metastatic involvement of the intertrochanteric region becomes so marked that the normal pull of the iliopsoas results in avulsion.\textsuperscript{8} An extremely high degree of suspicion for neoplasm must be maintained whenever a skeletally mature patient presents with an isolated lesser trochanteric fracture and MRI or bone scan should be considered even when radiographs and CT scans do not show evidence of such a lesion.\textsuperscript{6}

References: