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Chief Complaint: left hip pain

Case History:
The patient is a 12 year old boy with left hip pain of two days duration. The pain started while he was playing basketball, the final seconds of the clock were running out on the game and he jumped to throw the ball from half court for a final shot and felt a “pop” in the left hip. He fell as he landed because he was unable to bear weight on the left leg. (Incidentally, he DID make the shot, winning the game for his team) He was unable to bear weight and was seen in the emergency room that evening. Left hip radiographs (AP Pelvis and lateral hip?) X-rays were performed and he was given the diagnosis of greater trochanteric bursitis and told to follow up in the sports medicine clinic. He has used crutches, consistently since the injury. His pain has been controlled with Tylenol, with codeine. He has significantly reduced pain at rest. He reports his hip pain is exacerbated by hip flexion or abduction (in and out of the car) or when getting up from the seated position.

Past Medical History:
• Mild, intermittent asthma, no recent symptoms (has not used inhaler since the spring.
• Surgical removal of nevus from right side of chest

Allergies:
• NDKA, mild environmental allergies.

Family history:
• non-contributory.

Social History:
• non-contributory

Review of Systems:
• entirely negative except for the issues in the HPI

Physical Exam:
• Body Habitus: thin, normal muscle mass
• Gait: antalgic
• Exam of the Pelvis/Hips:
  o Visual inspection:
    ▪ Bruising and soft tissue swelling over the Left greater trochanter.
    ▪ No deformity or pelvic obliquity.
  o Range of motion:
- Passive ROM: full bilaterally. Painful over the left greater trochanter with the last 10° of external rotation.
- Active ROM: Lacks 30° active left hip flexion due to pain. Otherwise AROM was normal and symmetric.
  - **Strength testing:**
    - Exquisite pain over the left greater trochanter and decreased strength with resisted left hip abduction, especially with abduction performed in the sidelying (rather than seated) position. Moderate pain over the left greater trochanter with resisted hip flexion. Full left hip strength with resisted adduction and extension
    - Full strength with all testing of the right hip
  - **Palpation:**
    - Very tender to palpation over the left greater trochanter. Otherwise non-tender bilaterally, including the iliac crest, ASIS, AIIS, groin, pubic symphysis, thigh.
  - **Flexibility:**
    - Hamstring flexibility: popliteal angle: -35° bilaterally
    - When lying prone the heel is 3 centimeter from the buttock bilaterally.
    - Ober’s test: Causes pain over the left greater trochanter, but no significant decrease in flexibility noted on the left. Not performed on the right due to significant pain with side-lying on the left side.
  - **Trendelenburg test:** negative
  - **FABERE test:** negative
- **Lumbar spine exam:** entirely normal, including ROM, palpation, straight leg raise.
- **Neurological exam:** normal lower extremity DTRs, and sensation.
- **Vascular exam:** normal distal pulses and capillary refill, no clubbing cyanosis or edema
- **Skin:** Bruising over the left greater trochanter, otherwise normal

**Radiographs:**
AP Pelvis + Bilateral Frog Lateral of the Hips: 2mm widening of the left greater trochanteric apophysis.

**Final Diagnosis:** Left Greater Trochanter Apophysis Avulsion

**Clinical Course:**
The patient was instructed to weight bear as tolerated, and he was able to discontinue use of crutches completely 7 days after the original injury. Physical therapy was started 7 days after the injury to regain strength and improve overall lower extremity flexibility. The patient was pain-free with all activities 3.5 weeks after the injury and had only minimal tenderness with deep palpation over the greater trochanter. He was able to return to his usual sports activities 4 weeks after the injury without limitations.

**Discussion:**
Greater trochanteric avulsion fractures are an unusual pelvic avulsion fracture (Ogden 1984). The greater trochanter apophysis appears at 2-3 years of age and fuses by 16-17 years of age,
Avulsion fractures typically occur between 7-17 years of age. The gluteus medius and minimus muscles insert on the greater trochanter and perform hip abduction, flexion and internal rotation.

A recent case report and review of the literature proposes a classification system for these fractures (Chotel 2004). Type 1 lesions, as demonstrated by this case, are caused by acute contraction of the gluteal muscle and are not usually associated with significant complications. Fractures with displacement more than one centimeter may require surgical fixation. Type 2 lesions occur in conjunction with femoral neck fracture and are associated with a subsequent risk for femoral head necrosis. And, Type 3 lesions occur with hip dislocation and almost always lead to femoral head necrosis. Type 2 and 3 injuries are usually associated with significant trauma, unlike type 1 injuries.

In greater trochanteric avulsions, the threshold for surgical fixation may be lower than for other pelvis avulsion fractures, such as ASIS or AIIS fractures, where surgical intervention is usually recommended with 2-3 cm of displacement, rather than the 1 cm suggested for greater trochanteric avulsions. This is due to the significant role of the abductor musculature in hip and gait mechanics (Wood 2005).

**References and recommended reading:**

