

Normal Radiographs in Patients With Persistent “Hip Pain” — Value of Magnetic Resonance Imaging

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Case 1. The first case is a 57-year-old African-American woman with diabetes mellitus and endstage renal disease undergoing peritoneal dialysis, who presented with disabling pain in the left hip of about 10 weeks' duration, unrelated to trauma. She had not been ambulatory for several months due to severe diabetic neuropathy. Range of motion of the left hip, particularly external rotation and abduction, was diminished and painful; pain was reproduced on palpation anteriorly over the femoral head. Pain limited the ascertainment of muscle strength; straight leg raising was negative. Radiographs revealed only osteopenia. Magnetic resonance imaging (MRI) showed a tear of the left iliopsoas muscle at the musculotendinous junction. In Figure 1, note the marked increased signal within the iliacus muscle (arrow) due to intramuscular hematoma.

Case 2. The second case is a 62-year-old Caucasian woman with long-standing rheumatoid arthritis and an undefined clotting disorder, who was taking methotrexate, low dose prednisone, infliximab, and warfarin. She presented with a

3 week history of limiting right hip pain, worse on weight-bearing, unrelated to trauma. Range of motion of the right hip was full, but painful on external rotation and abduction. Radiographs showed only osteopenia. MRI to determine the cause of hip pain revealed a transverse stress fracture, insufficiency type, of the right femoral neck at its medial junction with the femoral head. In Figure 2 note a focal area of marrow edema in the medial right femoral neck (decreased signal in Figure 2A and increased signal in Figure 2B); within this area of marrow edema there is a line of decreased signal (arrow, Figure 2B) consistent with a fracture. The fracture was internally fixed and reduced with excellent results.

Case 3. The third case is a 32-year-old African-American man who presented with a 5 week history of progressive difficulty walking and performing movements requiring flexion of the hips. He also reported symptoms of intermittent dysphagia with weight loss, but denied the presence of fever, rash, mouth ulcers, or Raynaud's symptoms. Because



Figure 1. Case 1. Coronal proton density weighted image with fat suppression.



A



B

Figure 2. Coronal T1 weighted (A) and proton density weighted (B) images with fat suppression.

of the perceived weakness, he had undergone electromyographic studies as well as a muscle biopsy; neither revealed myopathy or myositis. Examination was notable for diffuse weakness, but was complicated by pain with passive movement of the shoulders, elbows, wrists, interphalangeal joints, and hips. The right hip was preferentially maintained in flexion and was exquisitely sensitive to passive rotation or extension. Laboratory studies were notable for a normocytic anemia (hematocrit 23%); platelet count and peripheral white blood cell count and differential were normal. Creatinine was elevated at 4.6 mg/dl with 3+ proteinuria,

but the urine sediment was normal with no evidence of casts or hematuria. Radiographs of the hands, wrists, hips, and pelvis were unremarkable. Due to the abnormal hip examination result, MRI study of the hip and pelvis was obtained. MRI revealed generalized marrow signal abnormalities and increased signal in the periarticular muscles of the right hip. The T1 weighted image shows multiple patchy areas of decreased marrow signal within the pelvis as well as both femoral heads and necks (Figure 3A). The proton density weighted image also shows a focal area of increased signal in the right sacrum (Figure 3B, arrow) that represents marrow replacement. This image also shows increased signal in the muscles adjacent to the right hip, felt to repre-



A



B

Figure 3. Coronal T1 weighted (A) and proton density weighted (B) images with fat suppression.

sent nonspecific edema due to altered biomechanics from an antalgic gait. Subsequent immunofixation electrophoresis studies of the serum and urine revealed the presence of monoclonal (kappa) light chains, and a bone marrow aspirate confirmed a large population of immature plasma cells consistent with multiple myeloma. Marrow replacement resulting from myeloma has been described¹, but the increased signal in the periarticular muscles has not. We speculate that it might have contributed to the patient's hip girdle pain.

MRI is the most sensitive and specific method for detecting radiographically occult hip fractures, osteonecrosis, or injury to muscles, tendons or other soft tissues^{2,3}. These cases illustrate the value of MRI in clarifying the etiology of persistent hip pain.

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