Challenges in Sports Medicine & Orthopedics

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Figure 1

Figure 2

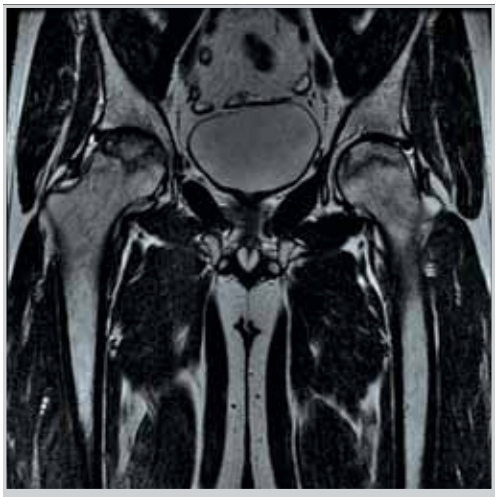

Figure 3

Figure 4

Figure 5

A 39-year-old man presents with a 4-month history of increasing bilateral hip pain. He states pain is worse in his right hip and is most intense during ambulation. He denies any direct hip trauma or injury. Examination reveals significant decrease in active and passive range of motion in both hips. Radiography and magnetic resonance imaging (MRI) of both hips are completed (Figures 1-5).

What is your interpretation of the radiographic and MR images?

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ANSWER


Figure 1


Figure 2


Figure 3


Figure 4


Figure 5

The five radiographs and MRIs (Figures 1-5) reveal bilateral avascular necrosis (AVN; osteonecrosis) of the femoral head. The "frog-leg" lateral radiograph of the right hip (Figure 1) reveals fracture line and dome collapse of the right femoral head (white arrow); the anterior-posterior radiograph of the pelvis (Figure 2) reveals mild dome collapse of the right femoral head (white arrow), but the left hip appears within normal limits. MR images reveal fracture lines through bilateral femoral heads (white arrows, Figure 3), confirm dome collapse is limited to right femoral head (white arrow, Figure 4), and show a large region of bone affected by AVN in bilateral hips (whitened area in femoral head and neck [white arrows, Figure 5]).

AVN occurs when there is an impairment of blood circulation to a region of bone, resulting in death of osteocytes and other cells in the involved area.[1] It can develop:

- after trauma
- in the presence of a predisposing medical condition
- when taking a medication associated with disruption of blood flow through small arterioles of bone.

Nontrauma-related causes of AVN include sickle-cell anemia, Gaucher disease, hypercoagulable disorders (eg, antiphospholipid antibody syndrome, Factor V Leiden), long-term corticosteroid therapy, pregnancy, malignancy, stasis, and chemotherapy.

Although AVN can occur in any bone structure, the hip is the most common site, with bilateral involvement in 60% of patients.[1] If bone collapse has not occurred, observation with strict nonweight-bearing activity may be attempted. Pain from AVN in the knees and shoulders usually resolves within 3 to 6 months; however, radiographs should be completed every 4 weeks to evaluate any significant changes in the bone architecture. Surgical treatment with core decompression is more commonly attempted with femoral AVN in the absence of appreciated dome collapse. This procedure reduces pressure inside the neck and head of the femur by removing bone, thereby promoting blood flow to the compromised surrounding area. If collapse of the dome has occurred, then hip-replacement surgery is recommended.

The patient in this case was referred to orthopedic surgery for left hip-core decompression and right hip arthroplasty. Of note, although patient's family history is remarkable for sickle-cell disease, he had not yet been diagnosed with the condition.

REFERENCES

1. Bukata S, Rosier R. Metabolic bone disease and osteonecrosis. In: Greene WB. *Netter's Orthopaedics*. 1st ed. Philadelphia, PA: Saunders Elsevier; 2006:40,43.