UNIVERSITY of ROCHESTER MEDICAL CENTER

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DEPARTMENT OF IMAGING SCIENCES

Imaging Sciences Interesting Cases

CASE 55

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CLINICAL PRESENTATION: A 43-year-old female presents with one month of pain and decreased motion in her left second toe.

IMAGING FINDINGS: Plain radiographs of the foot demonstrate bony deformity with flattening of the second metatarsal head and collapse of the articular surface (**Figs. 1 & 2**). There is also change in bone density with sclerosis and cystic change of the distal metatarsal. Compare to the normal appearing third metatarsal (**Fig. 3**).

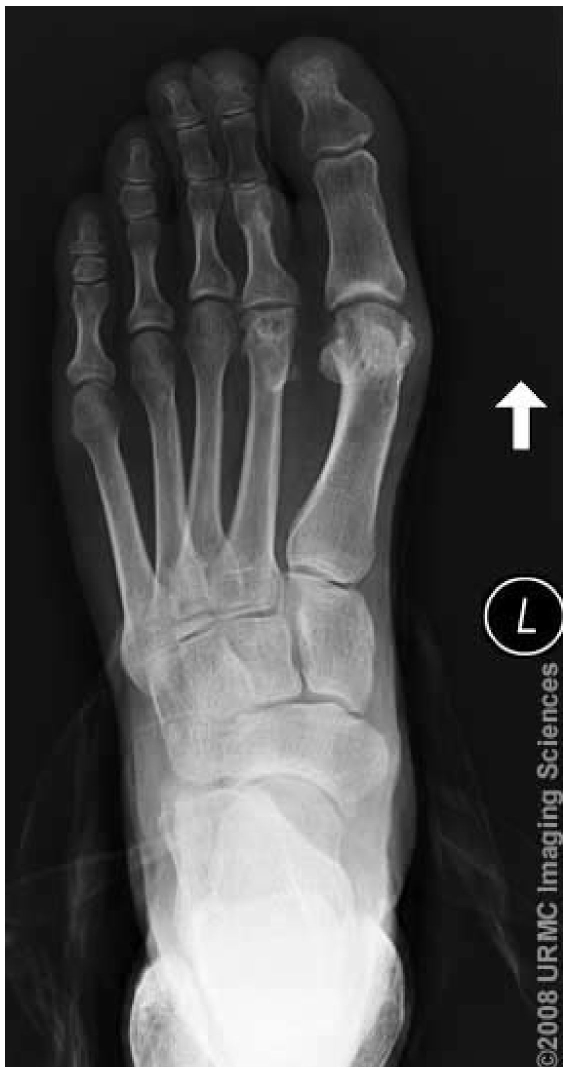

Figure 1: AP view of the left foot.

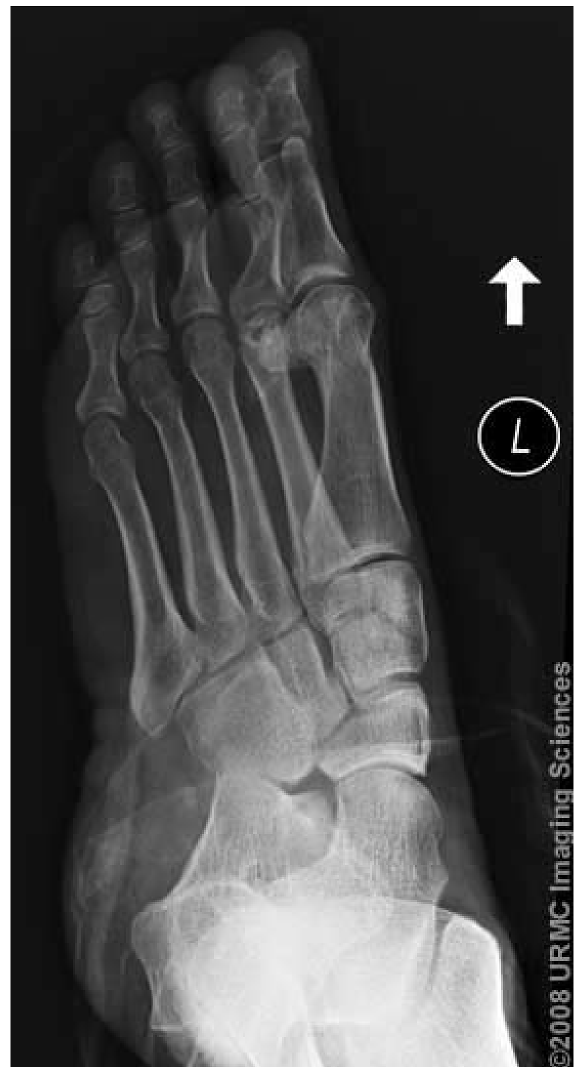

Figure 2: Oblique view of the left foot.

Figure 3: Close-up AP view of the second and third metatarsal heads.

DIAGNOSIS: Freiberg Infraction (AVN of the 2nd metatarsal head)

DISCUSSION: Avascular necrosis (AVN) is defined as cellular death of bone due to interruption of the blood supply. This leads to bony collapse and destruction, as well as the clinical symptoms of pain and loss of joint function. AVN affects bones with a single terminal blood supply such as the femoral head, carpal bones, metatarsals, talus, and humerus. The most commonly affected site is the hip. Causes of AVN include corticosteroid use, sickle cell, SLE, alcohol abuse, trauma, congenital anomalies (SCFE, congenital hip dysplasia), infection, radiation and pregnancy.

Freiberg infraction is AVN of the metatarsal head (usually the second or third metatarsal head). It is characterized by collapse of the subchondral bone, osteonecrosis, and cartilaginous fissures. The exact cause of Freiberg infraction is unknown but may be secondary to acute or repetitive trauma and subsequent vascular compromise. Given that it is most common in post-adolescent women, some believe high-heeled constrictive shoes may play a causative role. The symptoms, similar to any form of AVN, include pain and limited motion of the affected area. Freiberg infraction can be easily diagnosed by plain radiography when it is advanced. Early diagnosis may require a MRI or radionuclide bone scan.

Histology is the gold-standard for diagnosis, although it is usually unnecessary. Treatment is usually conservative and includes non-weight bearing, immobilization and possibly bisphosphonates to delay collapse if AVN is detected early enough. Ultimately, surgery is often required. Early surgical options include core decompression or osteotomy with or without bone grafting. Later, joint replacement or amputation may be required.

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