

## What's Your Diagnosis?

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**Signalment:** 9 ½ year old, male castrate Greyhound dog

**History:** The patient presented to referring veterinarian with a history of decreased energy level and having a slight limp of his right hind leg for about 1 month. The referring veterinarian had taken previous radiographs which showed a lytic lesion of the right distal femur. The patient was sent home with Carprofen (75mg tablets). The patient was up to date on vaccines.

**Presenting Complaint:** Presented to KSU VHC for an orthopedic consult, as recommended by the referring veterinarian.

**Physical Exam:** On presentation the patient presented with pain on extension of his left hind and upon palpation of the right distal femur. All other findings were within normal limits. Temperature: 100.5, Pulse: 112 (strong), shaking, and bright alert responsive. Other abnormalities noted included: mild to moderate dental tartar and a tense abdomen.

**Diagnostic Plan:** Patient was evaluated by obtaining thoracic radiographs (three views) and two views of the right femur. A fine needle aspirate of the lateral aspect of the distal right femur was also performed to get cytology. The sample was inconclusive. No other testing was done on this day.

Right femur radiographs:

Right Cranio-caudal:



**Right Lateral:**



**Radiographic Interpretation:**

There is permeative osteolysis of the right distal femur at the level of the metaphysis and the medial condyle. There is a small area of periosteal new bone growth at the caudal aspect distal femur cranially to the fabellae.

**Radiographic Conclusion:**

There is an aggressive process present in the right femur. The top differential is neoplasia (primary bone) with lesser consideration being given to fungal osteomyelitis.

**Represented to KSU VHC:**

The patient presented on emergency for non-weight bearing lameness on the right hind leg. Radiographs of the right hind limb were taken to confirm suspicion of fracture.

**Right Femur Radiographs:**

**Right Lateral:**



**Right Cranio-caudal:**



**Radiographic Interpretation:**

There is significant circumferential soft tissue swelling around the right femur. There is a spiral fracture at the mid to distal diaphysis of the right femur with proximomedial displacement and caudal angulation. A fissure fracture is present extending from mid-diaphysis to distal diaphysis just proximal to the area of the metaphysis. There is permeative osteolysis with irregular margins in the distal femur extending to the fracture site. The lysis in the distal femur is more severe than what was present in the previous study of the right femur.

**Radiographic Conclusion:**

Pathologic right femur fracture of the mid to distal diaphysis. The soft tissue swelling is likely due to trauma causing hemorrhage and/or inflammation.

**Final Outcome:**

After confirming pathologic fracture the owners elected to humanely euthanize. They were not interested in pursuing amputation or further work-up due to the patient's age and diagnosis of neoplasia.

### **Discussion:**

Pathologic fractures result from secondary bone weakening by an underlying disease process. There is no abnormal trauma to the bone that fractures. Neoplasia is a common cause of pathologic fracture, with hyperparathyroidism and infection being other associated causes. Recognizing a pathologic fracture is important because it influences treatment options and prognosis.

It was stated by Bhandal and Boston that <3% of all long bone fractures observed in dogs and 6% in people have been reported to be pathologic fractures. In the case series study that was completed by Bhandal and Boston, immediate or delayed euthanasia was the most common treatment choice (68%). In another study conducted by Heidner et al. twelve dogs were diagnosed with osteosarcoma and four of these dogs developed a pathologic fracture.

Canine osteosarcoma is the most common bone malignancy in dogs. Osteosarcoma can have a varied presentation which may include acute lameness, recurring lameness, and subtle to obvious swelling (with pain). Even though this patient was not confirmed to have osteosarcoma, there is high suspicion that it was the cause of the bone lesions and pathologic fracture. Unfortunately, the radiographic appearance of osteosarcoma varies. The most common features include loss of cortical detail, sun-burst pattern, loss of trabecular pattern, or areas of variable lysis.

Along with pathologic fracture, there is greater than 90% chance that osteosarcoma will eventually develop lung metastasis. About 10% have detectable lung metastasis at diagnosis of osteosarcoma. Therefore, it is advisable to acquire three view thorax radiographs to obtain visualization of the lungs.

The primary treatment goal for a patient with osteosarcoma is to control pain. This may involve complete removal of all macroscopic tumor, radiation therapy, and control or slow development of metastasis (chemotherapy)

## References:

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