What Is Your Diagnosis?

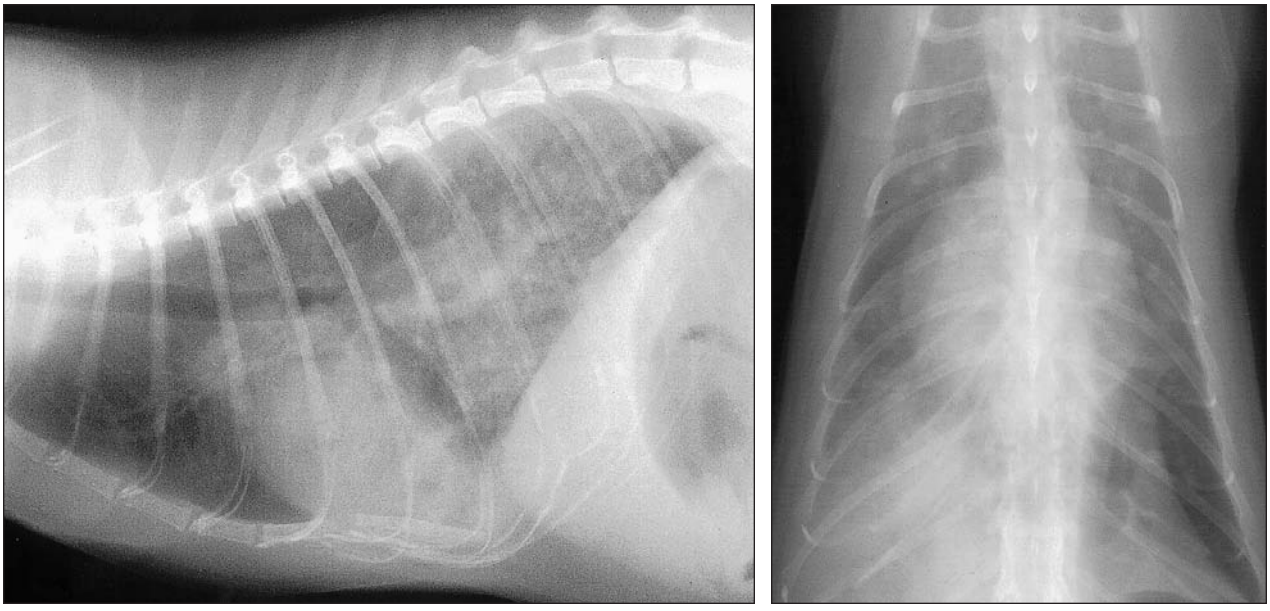

Figure 1—Lateral (left) and ventrodorsal (right) radiographic views of the thorax of a 10-year-old cat with acute respiratory distress.

History

A 10-year-old castrated male domestic shorthair cat was evaluated because of acute onset of respiratory distress, anorexia, and lethargy. The cat was kept outdoors and was not current on vaccinations. There was no known history of trauma or exposure to toxins. Physical examination indicated respiratory distress, cyanosis, bradycardia, and hypothermia. Thoracic auscultation revealed loud bronchovesicular sounds in all lung fields and a prominent second heart sound. The cat was placed in a heated oxygen chamber. It remained tachypneic, but mucous membranes returned to normal color. Results of tests for FeLV and feline immunodeficiency virus were negative, and results of CBC and serum biochemical analyses were within reference ranges. Thoracic radiographs were obtained (**Fig 1**).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then see the next page ⧫

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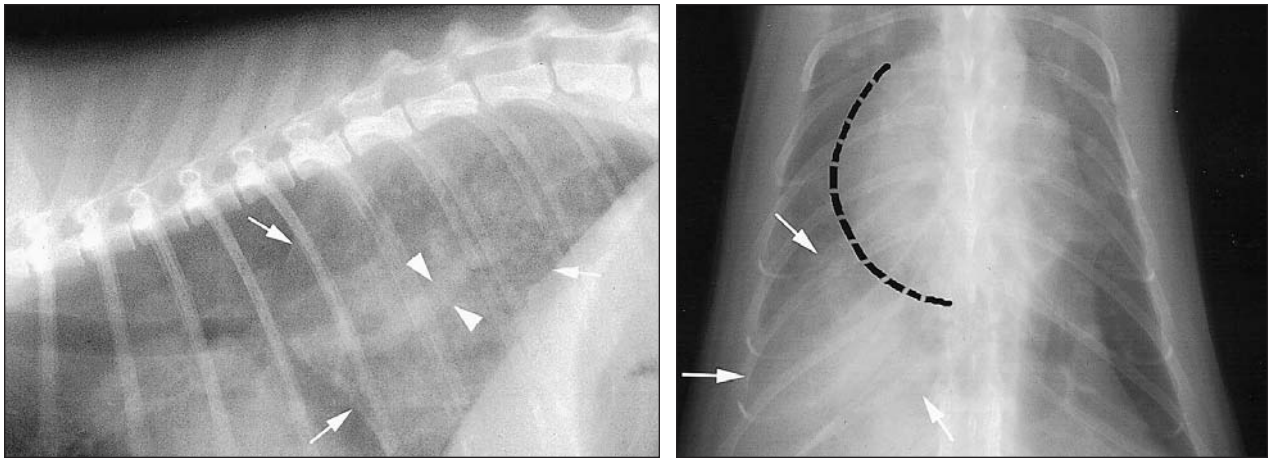

Figure 2—Same radiographic views as in Figure 1. A severe alveolar pattern (arrows) is evident in the right caudal lung lobe. A large, blunted pulmonary vessel (arrowheads) and right-sided cardiomegaly (outlined area) are also apparent.

Diagnosis

Radiographic diagnosis—Severe alveolar pattern in the right caudal lung lobe, a large, blunted pulmonary vessel, and right-sided cardiomegaly (**Fig 2**).

Comments

Echocardiography was performed (**Fig 3**). The right atrium and ventricle were dilated. Linear, double-walled echodensities, evident in the right atrium and ventricle, were consistent with the ultrasonographic appearance of adult heartworms (*Dirofilaria immitis*). The presumptive diagnosis was acute pulmonary thromboembolism secondary to spontaneous death of adult heartworms. The cat was treated with furosemide (2 mg/kg [0.91 mg/lb] of body weight, IV, q 8 h) and dexamethasone sodium phosphate (2 mg/kg [0.91 mg/lb], IV, q 8 h). Atropine (0.2 mg/kg [0.09 mg/lb], SC) was administered once to treat bradycardia, and the cat was sedated. Clinical signs of respiratory distress improved during the next 12 hours.

The following morning the cat was anesthetized, and jugular venotomy was performed. A cardiac catheter sheath was positioned in the right atrium, and 1 heartworm was retrieved with a loop snare. Additional worms were not detected. After venotomy, the cat was maintained in an oxygen chamber and treated with cefazolin, heparin, prednisone, and terbutaline. Thoracic radiography performed 3 days after venotomy revealed that the severe alveolar pattern in the right caudal lung lobe had cleared slightly. The cat was discharged from the hospital 3 days after surgery.

The most common clinical signs associated with heartworm disease in cats are coughing and dyspnea. Other signs include vomiting, anorexia, lethargy, weight loss, pleural effusion, signs associated with right-sided congestive heart failure, CNS disease, or gastrointestinal tract disturbances, and sudden death.[1] Cats commonly develop acute pulmonary thromboembolism as a result of spontaneous death of adult heartworms.[2]

Diagnosis of *D immitis* infection in cats is difficult. Microfilaremia is of brief duration. Tests that measure circulating antigen from mature female heartworms lack sensitivity when performed in cats, because cats typically have low worm burdens or are infected with all male or immature female worms.[3] Detection of *D immitis* antibodies only confirms exposure. Thus, to confirm a diagnosis of heartworm disease, other tests such as thoracic radiography and echocardiography must be performed.

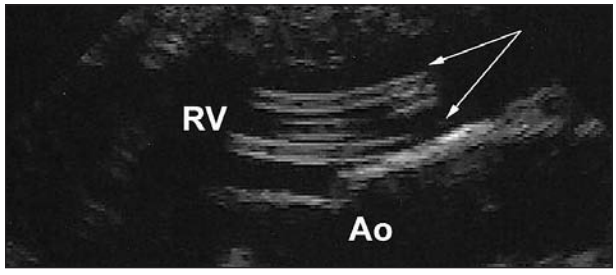

Figure 3—Two-dimensional echocardiogram of the cat described in Figure 1. The right atrium and ventricle appear dilated. Notice the linear double-walled echodensities in the right atrium and ventricle (arrows); this is the characteristic ultrasonographic appearance of adult heartworms.

Radiographic findings suggestive of heartworm disease include large tortuous lobar pulmonary arteries, right ventricular enlargement, and parenchymal lung disease.[3] Results of echocardiography may be 54 to 100% accurate for diagnosis of heartworm disease.[a] Detection of parallel echodensities within the pulmonary arteries and right chambers of the heart during 2-D echocardiography are conclusive evidence of *D immitis* infection.[a,b]

[a]DeFrancesco TC, Atkins CE, Meurs K, et al. Diagnostic utility of echocardiography in feline heartworm disease (abstr). *Am J Vet Int Med* 1997;11:141.

[b]Venco L, Morini S, Ferrari E, et al. Technique for identifying heartworms in cats by 2D echocardiography (abstr), in *Proceedings*. 9th Heartworm Symp 1998;23.

1. Rawlings CA, Calvert CA. Heartworm disease. In: Ettinger SJ, Feldman EC. *Textbook of veterinary internal medicine*. Philadelphia: WB Saunders Co, 1995;1046–1068.

2. Glaus TM, Jacobs GJ, Rawlings CA, et al. Surgical removal of heartworms from a cat with caval syndrome. *J Am Vet Med Assoc* 1995;206:663–666.

3. McCall JW, Dzimianski MT, McTier TL, et al. Biology of experimental heartworm infections in cats, in *Proceedings*. 7th Heartworm Symp 1992;71–79.