

What Is Your Diagnosis?

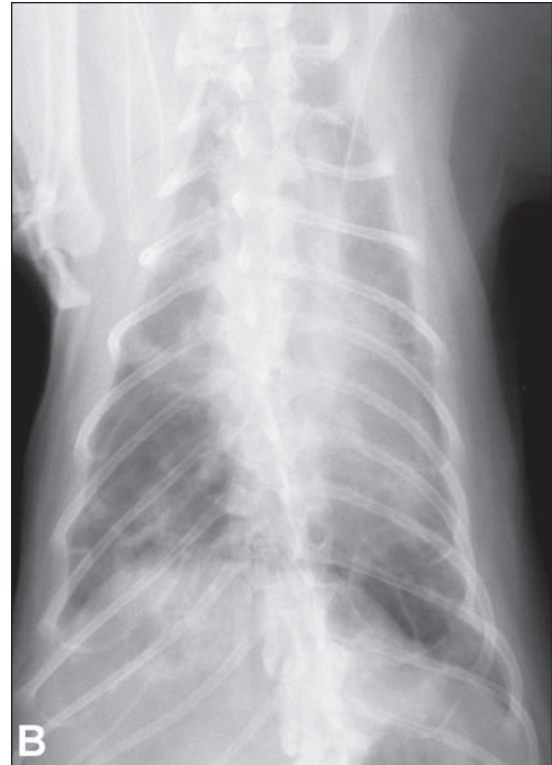
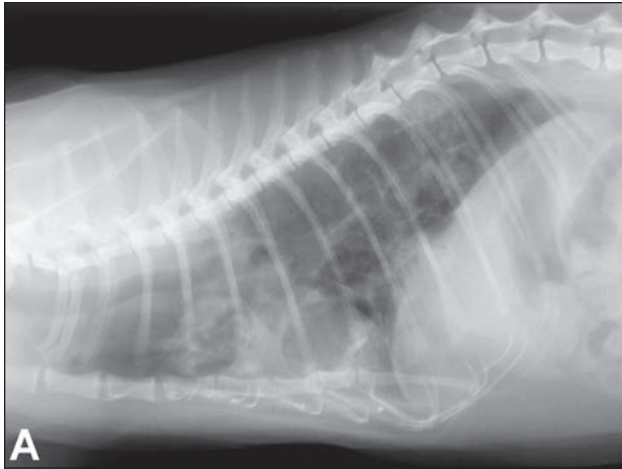


Figure 1—Right lateral (A) and ventrodorsal (B) radiographic views of a 9-year-old spayed female cat evaluated for difficulty breathing and inappetence of 2 days' duration.

History

A 9-year-old spayed female domestic longhair cat was evaluated for difficulty breathing and inappetence of 2 days' duration. According to the owner, the cat had intermittent bouts of reverse sneezing without nasal discharge. On physical examination, the cat was tachypneic with increased inspiratory and expiratory effort. Wheezing and referred upper airway sounds on inspiration and expiration were detected during auscultation of the thorax. Rectal temperature, heart rate, and results of CBC, serum biochemical analyses, and urinalysis were within reference ranges. Radiographs of the thorax were obtained (Figure 1).

Determine whether additional imaging studies are required or make your diagnosis from Figure 1—then turn the page ▶

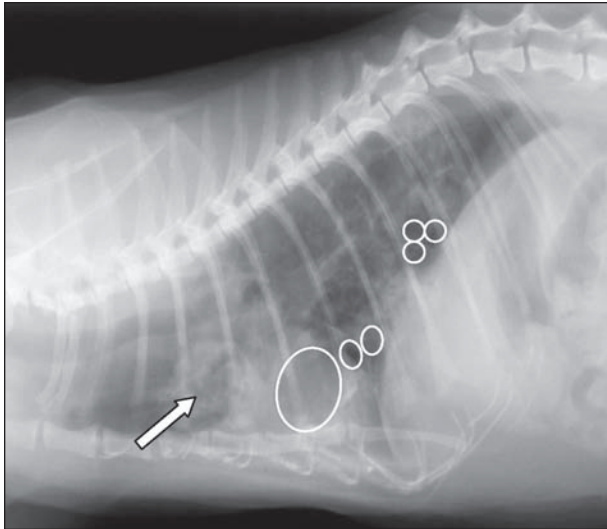


Figure 2—Same lateral radiographic view as in Figure 1. Notice multiple smooth thin-walled bullae of various sizes throughout the lungs (circles) and an alveolar pattern (arrow).

Radiographic Findings and Interpretation

A diffuse interstitial pattern is evident throughout the lungs (Figure 2). In addition, an alveolar pattern, which is patchy in distribution, is also evident and can be seen predominantly in the cranioventral lung field. Multiple smooth, thin-walled bullae of various sizes are seen throughout the lungs. The sternal deformity is considered an incidental finding. These radiographic findings are most compatible with an interstitial disease with alveolar infiltration. Differential diagnoses included verminous (eg, *Paragonimus kellicotti*, *Aelurostrongylus abstrusus*, or *Dirofilaria immitis*), bacterial, or granulomatous pneumonia; neoplasia (primary or metastatic); pulmonary fibrosis; and spontaneous bullous emphysema.

Comments

Bullae are gross air accumulations formed by the loss of alveolar walls. They are often multiple and can develop as a progression of emphysema or secondary to trauma.¹ Emphysema refers to the enlargement of peripheral air spaces with destruction of bronchiolar and alveolar walls attributable to a chronic pulmonary disease, such as chronic bronchitis, verminous migration, or neoplasia.

In the cat of this report, additional diagnostic procedures that were performed to determine the cause of pulmonary disease included fecal flotation, Baermann sedimentation test, and a heartworm antigen test to rule out verminous pneumonia; results of these procedures were negative. Other diagnostic procedures that may have been useful in determining the cause of pulmonary disease in the cat of this report included fine-needle aspiration of the lungs, bronchoscopy, bronchoalveolar lavage or transtracheal wash, or computed tomography. However, most of those procedures have associated risks such as the requirement for gen-

eral anesthesia or the potential for rupture of bullae causing iatrogenic pneumothorax. In dogs with radiographic evidence of bullae, thoracotomy or thoracoscopy performed early in the disease process has been recommended to decrease the recurrence and mortality rates and provide a better opportunity for a definitive diagnosis.² In the cat of this report, because the pathologic changes involved all lung lobes, the risk of surgery appeared to outweigh the potential benefits.

Because of a poor prognosis for recovery, the owners declined further diagnostic testing. Empirical treatment included fenbendazole (200 mg, PO, q 24 h for 10 days), doxycycline (10 mg/kg [4.5 mg/lb], PO, q 24 h for 21 days), albuterol delivered by a metered dose oronasal inhaler^a (2 actuations of a 100- μ g metered dose inhaler, q 12 to 24 h, indefinitely), and fluticasone propionate (2 actuations of a 220- μ g metered dose inhaler, q 12 h, indefinitely). The cat's clinical signs improved after discharge. Several weeks later, the owners reported that the cat was clinically normal, except for a rapid respiratory rate. Approximately 2.5 months after the initial evaluation, the cat collapsed acutely and was euthanized. Results of histologic examination were compatible with a bronchioalveolar carcinoma with squamous differentiation and metastasis to the tracheobronchial lymph nodes and the pericardial sac.

Most primary lung tumors in cats are carcinomas.³ Radiography of the thorax is a valuable tool in the evaluation of animals with pulmonary neoplasia; however, use of radiography has important limitations. Masses < 5 mm in diameter may not be detected on radiographs of the thorax. A definitive diagnosis of pulmonary neoplasia cannot be made on the basis of radiographic findings alone and requires cytologic or histologic examination of affected tissues.¹ Primary lung tumors, such as adenocarcinoma or squamous cell carcinoma, can be classified by site of origin (bronchi or alveoli) or cellular morphologic characteristics.³ In the cat of this report, the tumor involved the bronchial and alveolar tissues, with extensive areas of necrosis and focal nests of neoplastic squamous cells. Interestingly, this neoplasia resulted in multiple bullae of various sizes throughout the lungs; solid masses were not detected.

a. OptiChamber, Respironics, Cedar Grove, NJ.

1. Hawkins EC. Pulmonary parenchymal diseases. In: Ettinger SJ, Feldman EC, eds. *Textbook of veterinary internal medicine*. 5th ed. Philadelphia: WB Saunders Co, 2000;1061–1092.

2. Puerto DA, Brockman DJ, Lindquist C, et al. Surgical and nonsurgical management of and selected risk factors for spontaneous pneumothorax in dogs: 64 cases (1986–1999). *J Am Vet Med Assoc* 2002;220:1670–1674.

3. Fox LE, King RR. Cancers of the respiratory system. In: Morrison WB, ed. *Cancer in dogs and cats, medical and surgical management*. Jackson, Wyo: Teton NewMedia, 2002;497–512.

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