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What Is Your Diagnosis?

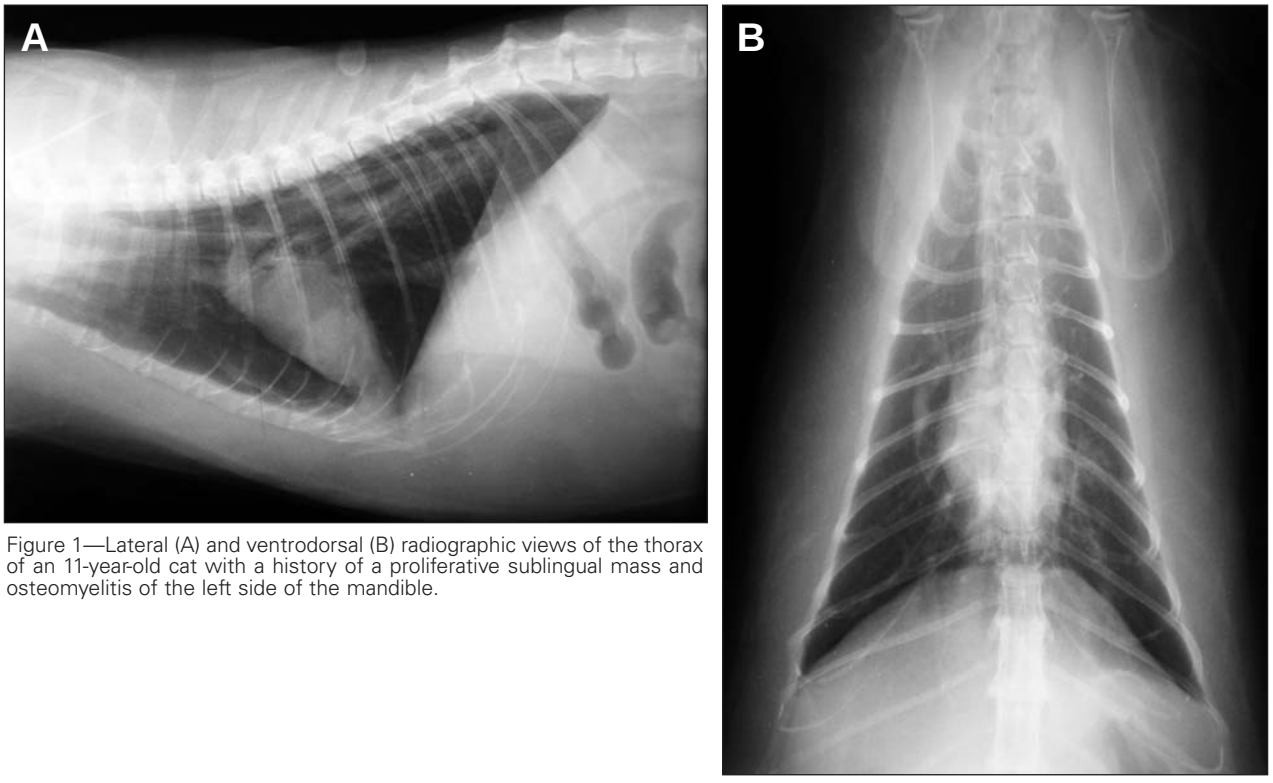

Figure 1—Lateral (A) and ventrodorsal (B) radiographic views of the thorax of an 11-year-old cat with a history of a proliferative sublingual mass and osteomyelitis of the left side of the mandible.

History

An 11-year-old castrated male domestic longhair cat was evaluated for metastatic disease. The cat was being treated for osteomyelitis of the left side of the mandible, and a proliferative sublingual mass had been detected during physical examination. The cat had been anorectic for 3 to 4 days. No abnormalities were detected during auscultation of the thorax. Radiographs of the thorax were obtained during general anesthesia (**Figure 1**).

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

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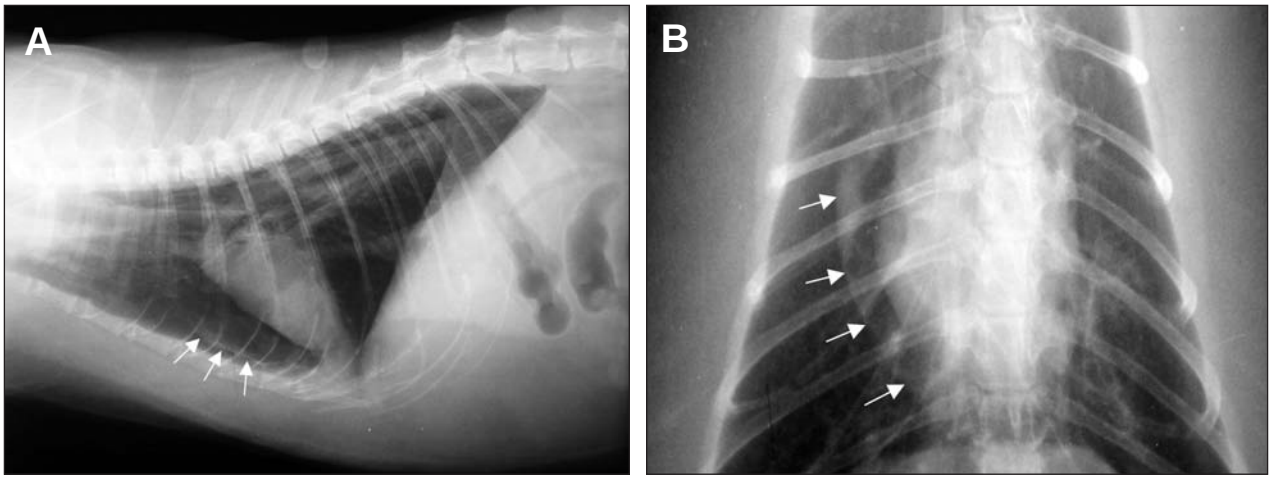

Figure 2—Same radiographic views as in Figure 1; the ventrodorsal radiographic view is enlarged. Notice air within the pericardial sac elevating the pericardium from the heart (arrows).

Radiographic Findings and Interpretation

Pneumomediastinum and pneumopericardium are apparent. The cardiac silhouette is small and appears elevated from the sternum, compatible with microcardia (**Figure 2**). Hypovolemia or shock should be considered as differential diagnoses for microcardia.

Comments

Pneumomediastinum is defined as free gas within the mediastinum. Causes of pneumomediastinum include tracheal tear or rupture; alveolar rupture; esophageal perforation; caudal extension of gas within fascial planes of the neck; or less likely, gas-producing organisms within the mediastinum. Gas within the retroperitoneal space can also travel cranially through the aortic hiatus into the mediastinum.[1]

Pneumopericardium is inflation of the pericardial sac with gas. Radiographically, the pericardium is seen as a thin, opaque, soft tissue structure separated from the heart by gas. Few cases of pneumopericardium have been published in the veterinary literature. Causes of pneumopericardium include traumatic injury to the thorax,[2] positive-pressure ventilation,[3] pulmonary-pericardial communication,[4] and tracheal ruptures associated with intubation.[5]

In the cat reported here, pulmonary macrometastases were not detected radiographically, ruling out metastatic disease as a cause of the radiographic findings. Radiography was performed during general anesthesia with a Bain nonrebreathing system. During anesthetic monitoring, the pop-off valve on the reservoir bag was discovered to have been closed, permitting maximal inflation of the bag. Alveolar rupture as a result of increased positive pressure within the anesthetic circuit likely caused the changes seen radiographically. Air from ruptured alveoli can dissect along the interstitium and around blood vessels to the mediastinum and into the pericardial sac. It is difficult to determine whether the microcardia was associated with the pneumopericardium; relative microcardia from thoracic overinflation is a more likely possibility.

Tracheal rupture or tear caused by traumatic intubation, overinflation of the endotracheal tube cuff, and movement of the endotracheal tube while positioning cats for radiography have been reported[5,6] to cause pneumopericardium and pneumomediastinum and could not have been ruled out as the cause of the findings in the cat reported here even though overinflation of the endotracheal tube cuff was not evident on radiographs. Pneumopericardium resulting from traumatic intubation with a stylet has been reported in cats.[5] A stylet was not used during intubation of the cat of this report. The cat recovered from anesthesia without complications, and no abnormalities were detected during auscultation of the thorax. Radiography performed the following day revealed that the pneumopericardium had resolved and the pneumomediastinum had improved.

1. Thrall DE. The mediastinum. In: Thrall DE, ed. *Textbook of veterinary diagnostic radiology*. 4th ed. Philadelphia: WB Saunders Co, 2002;376–389.

2. Parent C, Rozanski E. What is your diagnosis? *J Am Vet Med Assoc* 1998;212:1377–1378.

3. Brown DC, Holt D. Subcutaneous emphysema, pneumothorax, pneumomediastinum, and pneumopericardium associated with positive-pressure ventilation in a cat. *J Am Vet Med Assoc* 1995; 206:997–999.

4. Leclerc A, Brisson BA, Dobson H. Pneumopericardium associated with a pulmonary-pericardial communication in a dog. *J Am Vet Med Assoc* 2004;224:710–712.

5. Mitchell SL, McCarthy R, Rudloff E, et al. Tracheal rupture associated with intubation in cats: 20 cases (1996–1998). *J Am Vet Med Assoc* 2000;216:1592–1595.

6. Hardie EM, Spodnick GJ, Gilson SD, et al. Tracheal rupture in cats: 16 cases (1983–1998). *J Am Vet Med Assoc* 1999;214:508–512.