

What Is Your Diagnosis?

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Figure 1—Lateral radiographic view of the thorax of a 1-year-old dog evaluated for a nonproductive cough of 5 months' duration.

History

A 1-year-old 4.2-kg (9.2-lb) sexually intact female mixed-breed dog was referred for evaluation of a nonproductive cough of 5 months' duration. The owners reported that the cough occurred during exercise and while the dog was at rest in sternal recumbency. The dog was current on vaccinations and had been given heartworm preventative continuously since it was 4 months old. A mass was removed from the third digit of the left forefoot at 6 months of age. Auscultation of the thorax revealed inspiratory wheezes along the cervical portion of the trachea and in all lung fields. A cough was elicited by tracheal palpation. Rectal temperature and heart and respiratory rates were within reference limits. Abnormalities on serum biochemical analysis included high concentrations of phosphorus (5.5 mg/dL; reference range, 2.5 to 5.2 mg/dL) and calcium (11.9 mg/dL; reference range, 9.3 to 10.6 mg/dL). A lateral thoracic radiographic view was obtained (Figure 1).

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

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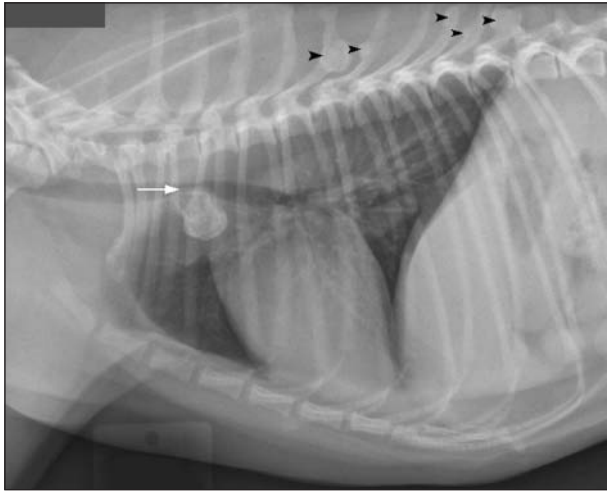


Figure 2—Same radiographic view as Figure 1. Notice the ventral compression of the trachea (white arrow) and exostoses on several spinous processes (black arrowheads).

Diagnostic Imaging Findings and Interpretation

On the lateral view of the thorax, there is a well-circumscribed mineralized mass originating from the ventral wall of the trachea at the level of the second and third thoracic vertebrae. This mass is associated with ventral compression of the trachea (Figure 2). Smoothly margined exostoses on the spinous processes of T5 and T6 and T8 through T10 and the costochondral junction of the tenth rib on the left side are consistent with multiple cartilaginous exostoses (Figure 2). Computed tomographic examination of the thorax confirmed a well-circumscribed, heterogeneously mineralized mass originating from within the tracheal wall, causing severe attenuation of the tracheal lumen (Figure 3). Differential diagnoses for the mineralized tracheal mass included osteochondroma, extraskelatal osteosarcoma, or tumor calcinosis.

Comments

Because of the extent of tracheal occlusion observed via computed tomography, a right fourth intercostal thoracotomy was performed. The mass appeared intramural in origin and was covered by normal-appearing mucosa. Intrathoracic tracheal resection of the mass and 3 cartilaginous rings with appositional anastomosis of the trachea was accomplished without complications. The dog recovered without coughing and was discharged from the hospital 3 days after surgery. Histologic examination of the mass confirmed the preoperative diagnosis of osteochondromatosis.

Neoplasms of the trachea are uncommon. In dogs, reported primary tumors of the trachea include osteosarcoma, chondrosarcoma, leiomyoma, lymphosarcoma, squamous cell carcinoma, mast cell tumor, adenocarcinoma, chondroma, and osteochondroma, with osteochondromas being the most common.¹ Osteochondromas are benign solitary cartilaginous growths that undergo endochondral ossification. The presence of multiple lesions



Figure 3—Axial computed tomographic image of the thorax. Notice the severe attenuation of the tracheal lumen (white arrow).

within an individual is known as multiple cartilaginous exostosis or osteochondromatosis. Radiographically, lesions appear as expansile, well-circumscribed, heterogeneously mineralized masses. The vertebrae, ribs, and long bones are the most frequently affected sites. Typically, lesions remain subclinical unless the exostoses compress normal anatomic structures.² Lesion growth typically ceases at skeletal maturity, but continued growth is suggestive of malignant transformation, which may occur years after the initial diagnosis of osteochondroma.^{2,3}

Computed tomography is valuable because it allows visualization of the extent of tracheal involvement and degree of luminal compression and facilitates surgical planning. Although tracheoscopy would have provided additional information about the intraluminal effect of the mass in the dog of this report, evidence supports that the trachea can easily be discerned with computed tomography, and this imaging modality provided much more information regarding the extent of the mass and involvement of surrounding structures.⁴ However, benign osteochondromas cannot be differentiated from malignant exostoses solely by results of computed tomography.⁵

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